3.5 CULTURAL RESOURCES

Cultural resources include prehistoric and historic-era archaeological sites; tribal cultural resources (TCRs) or traditional cultural properties (TCPs); built environment resources such as historic-era buildings, structures, and linear features); and landscapes and districts. Prehistoric archaeological sites are places where Native Americans lived or carried out activities during the prehistoric period, which is generally defined as before the 1760s in the VMP area. Historic-era archaeological sites reflect the activities of people after initial exploration and settlement in the region during the late 1700s. Native American sites can also reflect the historic era. Prehistoric and historic-era sites may contain artifacts, cultural features, subsistence remains, and/or human burials. TCRs are sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American tribe; TCRs are discussed in Section 3.13, "Tribal Cultural Resources," of this DEIR. TCPs can include TCRs, but they also encompass resources that are culturally important to any community.

3.5.1 Environmental Setting

Prehistory

The prehistory of the VMP area reflects information known about the indigenous population from the time the region was first populated with humans until the arrival of the first Europeans, who recorded their journeys through the written record. The prehistoric record is derived from over a century of archaeological research, and while much has been gleaned from these studies, large gaps in the data record remain. The following prehistoric culture sequence, derived from Milliken et al. (2010:114-118), briefly outlines the prehistory of the San Francisco Bay region.

The Early Holocene (Lower Archaic; 8000 to 3500 B.C.) is considered a time when populations were very mobile as they practiced a foraging subsistence pattern around the region. Artifacts that characterize this period include the millingslab and handstone to process seeds, as well as large wide-stemmed and leaf-shaped projectile points.

The Early Period (Middle Archaic; 3500 to 500 B.C.) is marked by the appearance of cut shell beads in the archaeological record, as well as the presence of the mortar and pestle for processing acorns. House floors with postholes indicate substantial living structures, which suggests a move toward establishing a more sedentary lifestyle and an increasing population.

The Middle Period, which includes the Lower Middle Period (Initial Upper Archaic; 500 B.C. to A.D. 430) and Upper Middle Period (Late Upper Archaic; A.D. 430 to 1050), appears to be a time when geographic mobility may have continued, although groups began to establish longer-term base camps in localities from which a more diverse range of resources could be exploited. The first rich black middens are recorded from this period. The presence of milling tools, obsidian and chert concave-base projectile points, and sites in a wider range of environments suggest that the economic base was more diverse. By the Upper Middle Period, mobility was being replaced by the development of numerous small villages. Around A.D. 430 a "dramatic cultural

disruption" occurred, as evidenced by the sudden collapse of the *Olivella* saucer bead trade network.

The Initial Late Period (Lower Emergent; A.D. 1050 to 1550) reflects a social complexity that had developed toward lifeways of large, central villages with resident political leaders and specialized activity sites. Artifacts associated with the period include the bow and arrow, small corner-notched projectile points, and a diversity of beads and ornaments.

The Terminal Late Period (Upper Emergent; A.D. 1550 to circa 1750) generally represents the indigenous cultures that were encountered by the Spanish explorers when they first arrived in San Francisco Bay.

Ethnography

The population indigenous to the VMP area spoke a language referred to as Costonoan, a derivative from a Spanish term for "coast people." Costonoan, which consisted of six known languages and various dialects within those languages, was spoken over a broad territory that included all of the San Francisco Peninsula and all lands along the east and south of San Francisco Bay, and extended south to include Monterey Bay, Salinas Valley, and the area around Hollister. Those residing in the VMP area spoke the Chochenyo dialect of San Francisco Bay Costonoan (Milliken et al. 2009:6). This dialect was spoken along the east shore of the bay from Fremont north to Richmond, and easterly into the Livermore Valley.

The Costonoan peoples, who are referred to as the Ohlone, Mutsun, or Rumsen depending on geography, were not a united cultural or political entity (Milliken et al. 2009:2-4). Rather, there were strong differences between the San Francisco and Monterey bay occupants, not only in language but also in culture. Political affinity was based on the tribelet, which comprised one or more villages within a specific geographic territory (Levy 1978:487).

Typically, a tribelet controlled a territory with a range of 10 to 12 miles in diameter and contained a population of 200 to 400 people living among four or five villages (Milliken et al. 2010:99). Those groups living in the VMP region resided in large villages along permanent streams in locations that allowed access to the diverse resources found in the tidal marshlands, valley floor, and hills (Milliken et al. 2010:106; Moratto 2004:225). Such villages were below the elevation of the VMP area, but the hills of the VHFHSZ were accessed for hunting and collecting plant resources. In fact, the Ohlone regularly used controlled burning to reduce dense brush that was a fire hazard; to enhance grazing lands for deer, elk, and antelope; and to encourage the growth of seed-bearing grasses (Levy 1978:491).

The Ohlone of the south and east San Francisco Bay Area were among the first people in the region to feel the impact created by the arrival of the Spanish explorers. Mission Santa Clara de Assis in the town of Santa Clara was established in 1777, just seven months after the founding of Mission Dolores in San Francisco. This was followed by the pueblo at San Jose (Pueblo de San Jose de Guadalupe) shortly thereafter (Kyle et al. 2002:423-424). Mission San Jose, in present-day Fremont, was established in 1797.

The Huchiun Ohlone occupied the Oakland-Richmond area. They had strong trading and marriage ties with the tribes on the San Francisco Peninsula, traveling about the bay in tule

boats. By 1795, most, if not all, of the Huchiun tribal members had been relocated to Mission Dolores in San Francisco (Milliken et al. 2009).

History

The historic era began in the San Francisco Bay Area when Spanish explorers arrived in the late 1760s and 1770s. Members of the Portola expedition were the first to arrive, in November 1769, reaching San Francisco Bay before returning to Monterey. Pedro Fages followed in 1770 and made a return trip in 1772. The latter visit was chronicled by Father Crespi as Fages' group followed up the east side of the bay and eventually into the Sacramento Valley. Members of the Fages company were, thus, the first non-native people to traverse the Oakland Hills and VMP area (Kyle et al. 2002:5).

Mission Santa Clara de Assis was founded in 1777 on the banks of the Guadalupe River in the Santa Clara Valley, at the south end of San Francisco Bay. Later that same year, the Pueblo of San Jose de Guadalupe was established along the Guadalupe River, approximately 2.25 miles from the mission, to grow food for the clerics and their neophytes (or converts). The town, now known as San Jose, was the first civilian settlement in Alta California (Kyle et al. 2002:422-424).

It was not until 1797 that the Spanish settled in the eastern portion of San Francisco Bay. At this time, Father Fermin Francisco de Lasuen founded the Mission San Jose at the Ohlone village of Orisom (or Oroysom), in what is now Fremont in southern Alameda County. By the early 1800s, the mission had control of land north to Oakland and east into the Livermore Valley. The mission grew to be among the most populated Spanish missions in the system. It also contained large numbers of livestock that roamed throughout its land holdings. According to Kyle et al. (2002:7-8), "for the entire decade of the 1830s it maintained a remarkable record and was probably the most prosperous of all the California missions both before and after secularization." The mission was secularized in November 1836.

The VMP area of Oakland was once part of the Rancho San Antonio, a land grant awarded in 1820 by the last Spanish governor, Pablo Vicente de Sola, to Luis Maria Peralta. The rancho encompassed approximately 44,000 acres and stretched from the shores of San Francisco Bay to the crest of the hills, extending from San Leandro Creek on the south to El Cerrito Creek on the north (Kyle et al. 2002:9). Don Luis Peralta built an adobe in what is now old Oakland shortly after receiving the land. The adobe was originally occupied by his four sons, who operated the property, but they constructed their own homes in the 1830s and 1840s at other locations within the rancho. Don Luis Peralta divided Rancho San Antonio among his four sons in 1847, giving equitable shares to each that reached from the bay to hills. The VMP area is within the two central portions of the original land grant.

Anglo-Americans began to move into the area by the late 1840s, and two of the Peralta brothers sold off or rented most of their lands. Still, the area remained largely unpopulated by colonists until the onset of the Gold Rush. A great influx of unsuccessful argonauts began to filter into the east bay, where they squatted on property belonging to the Peraltas and others. The City of Oakland was established by three such squatters who, as a team, first settled on the land in 1850, then persuaded Antonio Peralta to rent them the property; they then proceeded as if they were the owners and laid out the town of Oakland. One of the squatters, Horace W. Carpentier, was elected to the State Assembly to represent Alameda County. He secretly presented a bill to

the state legislature in 1852 to incorporate Oakland; two years later, the City incorporated and Carpentier became mayor. During this early period, Carpentier also took control of and began development of the Oakland waterfront, and became a partner in a ferry to San Francisco (Kyle et al. 2002).

The area quickly grew when, in 1869, it was selected to be the western terminus of the transcontinental railroad; the port was also an important draw for economic and population growth. Growth was further spurred by the 1906 San Francisco earthquake, which drove thousands out of San Francisco toward the East Bay; Oakland's population doubled during this decade. Many small communities that had developed in the immediate vicinity during the early years of settlement were consolidated into the larger Oakland urban area. Most of the area encompassed by the VMP was annexed to the City in 1909 (Oakland Planning History 2020). By 1935, Oakland was one of the largest cities in the state.

Early on, the City invested in parks and open space for its citizens. This effort was spearheaded by Frank Mott, who was Oakland's mayor between 1905 and 1915. Mott teamed with Mumford Robinson, a well-known city planner, to develop a plan to beautify the city with civic improvements that included broad boulevards and large parks (Oakland Planning History 2020). The various parks and open spaces within the VMP area are a testimony to Mott's early vision of the City. Joaquin Miller Park, for example, was dedicated in 1917.

In the 1940s, Oakland grew rapidly due to wartime economic expansion; the combination of a large port and railroad terminus drew a substantial amount of wartime industry. Postwar industrial slowdown caused jobs and residents to move out of Oakland toward the end of the 1950s. The 1989 Loma Prieta earthquake damaged Oakland's infrastructure, including the collapse of a section of the Cypress Freeway in downtown Oakland and parts of the Bay Bridge. Rebuilding of the city since that time, and especially in the 2000s, has created a resurgence in prosperity and population.

Area of Potential Effects

An area of potential effects (APE) would be established for individual projects conducted under the VMP that require federal permits. Each APE would encompass the project's area of direct impact and a 20-foot buffer, as well as construction staging areas and access improvements, as necessary.

3.5.2 Regulatory Setting

Federal Laws, Regulations, and Policies

National Historic Preservation Act Section 106

The National Historic Preservation Act (NHPA) of 1966, as amended, requires federal agencies to consider the preservation of historic and prehistoric resources. The NHPA authorizes the Secretary of the Interior to expand and maintain the National Register of Historic Places (NRHP) and established an Advisory Council on Historic Preservation (ACHP) as an independent federal entity. Section 106 of the NHPA requires federal agencies to take into account the effects of their undertakings on significant cultural resources, which are referred to as *historic properties*, and afford the ACHP a reasonable opportunity to comment on the undertaking before licensing

or approving the expenditure of funds on any undertaking that may affect properties listed, or eligible for listing, in the NRHP.

Federal review of projects is normally referred to as the Section 106 process. The Section 106 review normally involves a four-step procedure described in detail in the implementing regulations (36 CFR Part 800):

- Initiate the Section 106 consultation process by notifying the appropriate consulting parties. Consultation is between the federal agency, the State Historic Preservation Officer (SHPO) or Tribal Historic Preservation Officer, and other consulting parties, including but not limited to the ACHP, certified local governments, and members of the general public with an economic, social, or cultural interest in the project.

- Identify properties that could be affected by the project and determine if they are listed in, or eligible for listing in, the NRHP, in consultation with the SHPO and interested parties.

- Assess the effects of the undertaking on properties that are eligible for inclusion in the NRHP, in consultation with the SHPO.

- Resolve adverse effects by developing and evaluating alternatives that could avoid, minimize, or mitigate impacts on historic resources. Consult with the SHPO, other agencies, and interested parties to develop an agreement (Memorandum of Agreement or Programmatic Agreement) that addresses the treatment of historic properties and notify the ACHP.

The ACHP's *Regulations, Protection of Historic Properties* (36 CFR Part 800) establish procedures for compliance with Section 106. These regulations define the criteria of adverse effect, define the role of the SHPO in the Section 106 review process, set forth documentation requirements, and describe procedures to be followed if significant historic properties are discovered during implementation of an undertaking. Historic properties must be considered in project planning and construction. The responsible federal agency must submit any proposed undertaking that may affect NRHP-eligible properties to the SHPO for review and comment before the project's approval.

As noted, Section 106 prescribes specific criteria for determining whether a project would have an adverse effect on a historic property, if any such properties exist within the APE as defined by the agency (36 CFR Section 800.5). An impact is considered adverse when prehistoric or historic archaeological sites, structures, districts, or objects listed in or eligible for listing in the NRHP are subjected to the following effects:

- Physical destruction of or damage to all or part of the property;

- Alteration of a property;

- Removal of the property from its historic location;

- Change of the character of the property's use or of physical features within the property's setting that contribute to its historic significance;

- Introduction of visual, atmospheric, or audible elements that diminish the integrity of the property's significant historic features;
- Neglect of a property that causes its deterioration; and
- Transfer, lease, or sale of the property.

Because the City would need to obtain a permit from USACE under CWA Section 404 for some of the proposed actions, the VMP constitutes a federal undertaking that would require compliance with Section 106 of the NHPA and federal significance criteria apply. For federally permitted or funded projects, cultural resource significance is evaluated in terms of eligibility for listing in the NRHP. The quality of significance in American history, architecture, archaeology, and culture is present in districts, sites, buildings, structures, and objects of state and local importance that possess integrity of location, design, setting, materials, workmanship, feeling and association, and that:

- Are associated with events that have made a contribution to the broad pattern of our history;
- Are associated with the lives of people significant in our past;
- Embody the distinct characteristics of a type, period, or method of construction, that represent the work of a master, that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
- Have yielded, or are likely to yield, information important in prehistory or history.

State Laws, Regulations, and Policies

California implements the NHPA through its statewide comprehensive cultural resource surveys and preservation programs. The California Office of Historic Preservation (OHP), an office of the California Department of Parks and Recreation (DPR), implements the policies of the NHPA on a statewide level. The OHP also maintains the California Historical Resources Inventory. The SHPO is an appointed official who implements historic preservation programs within the state's jurisdictions as well as serving as a consulting party in the federal process described above.

California Register of Historical Resources

The California Register of Historical Resources (CRHR) is an authoritative listing and guide to be used by state and local agencies, private groups, and citizens in identifying the existing historical resources of the state and to indicate which resources deserve to be protected, to the extent prudent and feasible, from substantial adverse change (Pub. Res. Code Section 5024.1[a]).

The eligibility criteria for inclusion on the CRHR are based on NRHP criteria (Pub. Res. Code Section 5024.1[b]). Certain resources are determined by the statute to be automatically included in the CRHR, including historic properties formally determined eligible for, or listed in, the NRHP. Cultural resources eligible for listing in the CRHR are referred to as *historical resources*.

To be eligible for the CRHR, a prehistoric or historic-period resource must be significant at the local, state, and/or federal level under one or more of the following criteria:

- It is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;
- It is associated with the lives of persons important in our past;
- It embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or
- It has yielded, or may be likely to yield, information important in prehistory or history.

For a resource to be eligible for the CRHR, it must also retain enough of its character or appearance (integrity) to be recognizable as a historical resource and to convey the reason for its significance. A historical resource that does not retain sufficient integrity to meet the NRHP criteria may still be eligible for listing in the CRHR.

The CRHR consists of resources that are listed automatically, as well as those that must be nominated through an application and public hearing process. The CRHR automatically includes the following:

- California properties listed on the NRHP and those formally determined to be eligible for the NRHP;
- California Historical Landmarks (CHLs) from No. 770 onward; and
- California Points of Historical Interest that have been evaluated by the OHP and have been recommended to the State Historical Resources Commission for inclusion on the CRHR.

Other resources that may be nominated to the CRHR are:

- Historical resources with a significance rating of Category 3 through 5 (i.e., properties identified as eligible for listing in the NRHP, the CRHR, and/or a register maintained by a local jurisdiction);
- Individual historical resources;
- Historical resources contributing to historic districts; or
- Historical resources designated or listed as local landmarks, or designated under any local ordinance, such as a historic preservation overlay zone.

California Environmental Quality Act

CEQA, as codified at Pub. Res. Code Sections 21000 et seq., requires lead agencies to determine if a proposed project would have a significant effect on archaeological resources. As defined in Section 21083.2, a "unique" archaeological resource is an archaeological artifact, object, or site

about which it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that it meets any of the following criteria:

- Contains information needed to answer important scientific research questions and there is a demonstrable public interest in that information;
- Has a special and particular quality such as being the oldest of its type or the best available example of its type; and
- Is directly associated with a scientifically recognized important prehistoric or historic event or person.

In addition, the CEQA Guidelines define historical resources as: (1) a resource in the CRHR; (2) a resource included in a local register of historical resources, as defined in Pub. Res. Code Section 5020.1(k) or identified as significant in a historical resource survey meeting the requirements of Pub. Res. Code Section 5024.1(g); or (3) any object, building, structure, site, area, place, record, or manuscript that a lead agency determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California, provided the lead agency's determination is supported by substantial evidence in light of the whole record.

If a lead agency determines that an archaeological site is a historical resource, the provisions of Pub. Res. Code Section 21084.1 and CEQA Guidelines Section 15064.5 would apply. If an archaeological site does not meet the CEQA Guidelines criteria for a historical resource, then the site is to be treated in accordance with the provisions of Pub. Res. Code Section 21083 regarding unique archaeological resources. The CEQA Guidelines note that if a resource is neither a unique archaeological resource nor a historical resource, the effects of a project on that resource shall not be considered a significant effect on the environment (CEQA Guidelines Section 15064[c][4]).

Assembly Bill 52 – Tribal Cultural Resources

TCRs, defined in Pub. Res. Code Section 21074(a), are also considered historical resources and are specifically addressed under CEQA. Impacts to TCRs are referenced independently from cultural resources in the CEQA checklist and are discussed in Section 3.13, "Tribal Cultural Resources," in greater detail.

AB 52 requires that state lead agencies consult with any California Native American tribe that is traditionally and culturally affiliated with the geographic area of a proposed project, if requested by the tribe. The bill, chaptered in Pub. Res. Code Section 21084.2, also specifies that a project with an effect that may cause a substantial adverse change in the significance of a TCR is a project that may have a significant effect on the environment. A detailed description of AB 52 and its requirements is provided in Section 3.13, "Tribal Cultural Resources," of this DEIR.

California Public Resources Code and California Administrative Code

Human remains, including those buried outside of dedicated cemeteries, are protected under several state laws, including Pub. Res. Code Section 5097.98 and Health and Safety Code Section 7050.5. Impacts could include intentional disturbance, mutilation, or removal of interred human remains.

Local Laws, Regulations, and Policies

City of Oakland General Plan

The City of Oakland General Plan contains a robust "Historic Conservation Strategy," which is thoroughly discussed in the Historic Preservation Element (City of Oakland 1994). Like most planning documents in urban areas, Oakland's General Plan focuses heavily on preservation of built environment resources (i.e., houses, buildings) and historic neighborhoods or districts.

Archaeological resources are addressed in Chapter 5, "Historic Preservation and Ongoing City Activities." The following policies are relevant to archaeological resources in the VMP area:

Objective 4: Archeological Resources: To develop databases identifying existing or potential archeological sites and adopt procedures for protecting significant archeological resources.

> **Policy 4.1 Archeological Resources**: To protect significant archeological resources, the City will take special measures for discretionary projects involving ground disturbances located in archeologically sensitive areas.

Policy 4.1 lists the following archaeological protection procedures for discretionary projects that involve ground-disturbing activities in sensitive areas:

- Mapping areas of high prehistoric or historic archeological potential;
- Archival studies for new development or other activities involving ground disturbance within areas of high archeological potential;
- Determination of whether the ground disturbance activity could damage archeological materials;
- Surface reconnaissance by archeologist, as necessary if ground disturbances could damage archaeological materials; and
- Subsequent actions, as necessary, such as monitoring or limited archaeological excavations.

3.5.3 Impact Analysis

Methodology

This analysis relies on standard professional practice for the assessment of VMP impacts on cultural resources. CEQA requires project proponents to assess a project's potential effects on historical resources (i.e., those that are listed or eligible for listing in the CRHR or in a local register or survey that meets the requirements of Pub. Res. Code Sections 5020.1[k] and 5024.1[g]). This entails the following steps:

- Identify potential historical resources.
- Evaluate the significance of identified cultural resources.

- Evaluate the anticipated effects of a project on all historical resources.

Archival Research

The Draft VMP (Dudek 2019:109) recognizes Oakland's rich and multicultural past, which includes Ohlone archaeological sites, buildings dating from the Spanish-Mexican settlement period, structures from the pioneer communities of the early 1860s, Italianate Victorian houses, and development from the 1906 post-earthquake boom. Historic-era buildings reflect a diversity of architectural styles, including Victorian, Beaux Arts, International, New Brutalist, and modernist styles. The VMP notes that the OHP's CRHR web page lists 67 resources in the City of Oakland. These include resources listed in the NRHP (51), as a CHL (8), as listed both in the NRHP and as a CHL (6), and as a State Point of Interest (2). There are 145 properties designated by the City as Oakland landmarks (City of Oakland 2020). The City also lists 45 buildings on a local register of historic resources and identifies nine historic preservation districts.

Eleven of the City's designated landmarks and one district are within the VHFHSZ area of the VMP. **Table 3.5-1** lists the resources within the VMP that are on Oakland's list of Designated Landmarks and historic preservation districts. Table 3.5-1 also provides information found in the OHP's *Built Environment Resources Directory* (BERD) for Alameda County (OHP 2020a) and California Historical Resources for Alameda County (OHP 2020b), and the NRHP (National Park Service 2020).

Table 3.5-1. City of Oakland Designated Landmarks and Historic Preservation Districts in the VMP

Oakland Landmark No.	Resource Name	CRHR Eligibility	NRHP Eligibility
4	Tower to General John C. Fremont in Joaquin Miller Park	No information; not in BERD	No information
5	Joaquin Miller Park and Abbey	Yes	Listed
32	Caldecott Tunnel – Bore 3	No	No information
34	Montclair Fire House – 6226 Moraga Avenue	Not evaluated	No information
37	Dunsmuir House and Carriage House – 2960 Peralta Oaks Court	Yes	Listed
38	Leona Park	No information; not in BERD	No information
40	Leimert Bridge	No information; not in BERD	No information
51	George McCrea House and Indian Campground – 3500 Mountain Boulevard	No information; not in BERD	Listed
103	Chrysthouse – 1600 Fernwood Drive	No information; not in BERD	No information
133	Claremont Resort and Spa – 41 Tunnel Road	Yes	Listed

Oakland Landmark No.	Resource Name	CRHR Eligibility	NRHP Eligibility
144	Morse House – 5654 Margarido Drive	Yes	Yes
8	Sheffield Village Historic District	Not evaluated	No information

Sources: City of Oakland 2020; OHP 2020a, 2020b; National Park Service 2020.

Research on the OHP web site also found that three designated CHLs (OHP 2020c) are within the VMP area, as listed in **Table 3.5-2**.

Table 3.5-2. California Historical Landmarks in the VMP Area

California Historical Landmark No.	Name	Location in the VMP Area
107	Joaquin Miller Home	Joaquin Miller Park
962	Site of Blossom Rock Navigation Trees	Redwood Regional Park, Madrone Picnic Area
970	Rainbow Trout Species Identified	Redwood Regional Park

Source: OHP 2020c

A record search of the VMP area was conducted by the Northwest Information Center (NWIC) of the California Historical Resources Information System at Sonoma State University in June 2020 (File No. 19-1867 and No. 19-2275). The purpose of the record search was to provide additional baseline information about the number of recorded cultural resources within the VMP area to ascertain the sensitivity of the region for cultural resources, along with the NRHP/CRHR eligibility status of the resources recorded. **Appendix E** of this DEIR contains the NWIC record search results. The NWIC information has largely been derived from study results voluntarily filed at the Information Center, and is not necessarily a comprehensive reflection of all cultural resources work conducted on the VMP lands. It is important to note that, although 40 studies (many of which include multiple reports) overlap with the VMP area, most of the property and roads included in the VMP area have not been completely surveyed for cultural resources. Of the 40 reported projects, 10 are along roadways (almost all on SR 13 and SR 24), while another 11 are telecommunications projects with either narrow linear or small isolated footprints; three others are general overviews of the region and six are for residential developments. The remaining 10 projects represented a variety of actions, including two studies for fire management and a study of Anthony Chabot Regional Park.

The record search revealed that four historic districts are included in or overlap portions of the VMP area. In addition, six archaeological resources and 14 built environment resources have been recorded in the VMP area. Many of these resources are elements of the four recorded districts that overlap portions of the VMP area. All of the recorded resources and districts are from the historic era; none reflect the prehistory or Native American presence in the region. Recorded resources in the program area, as identified by the NWIC record search, are listed in **Table 3.5-3**. Two districts, two buildings, and one archaeological site have previously been evaluated and determined to be significant properties or resources. One district, eight buildings, and one archaeological site have previously been evaluated and identified as not eligible for

either the CRHR or NRHP. The remaining seven buildings and archaeological sites have not yet been evaluated; data are not clear about the evaluation status of Anthony Chabot Regional Park.

Table 3.5-3. NWIC Record Search Results

Resource No. (P-XX-XXX)	Name/Title	Type[1]	USGS Quadrangle	NRHP/CRHR Eligibility
01-005846	Lake Temescal Regional Park	D	Oakland East	Not Eligible
01-010128	Bridge 28 0015L Caldecott Tunnel – Bore #3	BE	Oakland East	Not Eligible
01-010523	Lake Chabot Clubhouse*	BE	Hayward	Eligible for CRHR
01-011121	Cooper Residence	BE	Oakland East	Not Eligible
01-011122	Common Area of Tract 4156	BE	Oakland East	Not Eligible
01-011248	Utility Pole #110134281	BE	Oakland East	Not Eligible
01-011252	Utility Pole #26298	BE	Oakland East	Not Eligible
01-011377	Oakland, Antioch, & Eastern Railway / Sacramento Northern Railway	BE	Oakland East	Not Evaluated
01-011382	City of Oakland Fire Department Station 6	BE	Oakland East	Not Eligible
01-011414	Anthony Chabot Regional Park	D	Hayward, Las Trampas Ridge, Oakland East	Unknown[2]
01-011415, 07-004484	Redwood Regional Park Historic District*	D	Oakland East	Eligible
01-011416	CA-ALA-000650H – stone-lined ditch	BE	Oakland East	Not Eligible
01-011419	Anthony Chabot Equestrian Center*	BE	Oakland East	Eligible
01-011420, 07-004486	Sibley Volcanic Regional Preserve*/ Round Top Regional Park*	D	Oakland East	Eligible for the NRHP/Listed in the CRHR
01-011421	5750 Redwood Road / Skyline Ranch*	S	Oakland East	Eligible
01-011424	11500 Skyline Boulevard – Richard C. Trudeau Training Center	BE	Oakland East	Not Eligible
01-011538	Leona Heights Sulfur Mine / McDonell Sulfur Mine	S	Oakland East	Not Eligible
01-011995	S1: Refuse scatter	S	San Leandro	Not Evaluated
01-011997	S3: Stone Quarry	S	San Leandro	Not Evaluated
01-011998	S4: Fence line	BE	Hayward, San Leandro	Not Evaluated
01-011999	S5: Dirt Road	S	San Leandro	Not Evaluated
01-011200	S6: Cypress Structure Landfill (reclaimed)	S	Hayward	Not Evaluated
01-011201	S7: WPA-era landscape elements	BE	Hayward	Not Evaluated

Notes: Resources with an * have been evaluated and determined eligible for listing in the NRHP and/or CRHR.

[1] BE=Built Environment (building or structure); D=District; S=Site; WPA = Works Projects Administration

[2] The park was recorded as a district, but it appears that was not evaluated as such; only individual elements of the park were evaluated.

Source: NWIC Record Search File No. 19-1867, No. 19-2275.

The cultural resources study also examined the potential for surface archaeological resources within the VMP area, and a predictive model was developed using GIS. The fundamental concept surrounding predictive models is to project known patterns or relationships into unknown areas. In the case of archaeological predictive modeling, the primary assumption is that archaeological sites tend to recur in areas favorable to human settlement. The model utilized those environmental characteristics of places where sites do or do not occur, and allowed for the extrapolation from small areas to broader geographic areas. Previous research by Meyer (2013) has indicated that, among the multiple environmental conditions that may predict prehistoric human settlement or activity in central and northern California, three environmental factors—distance to water, slope, and distance to a confluence of streams —are useful for predicting the majority of site locations. Surface site potential within the VMP area is depicted in **Figure 3.5-1**.

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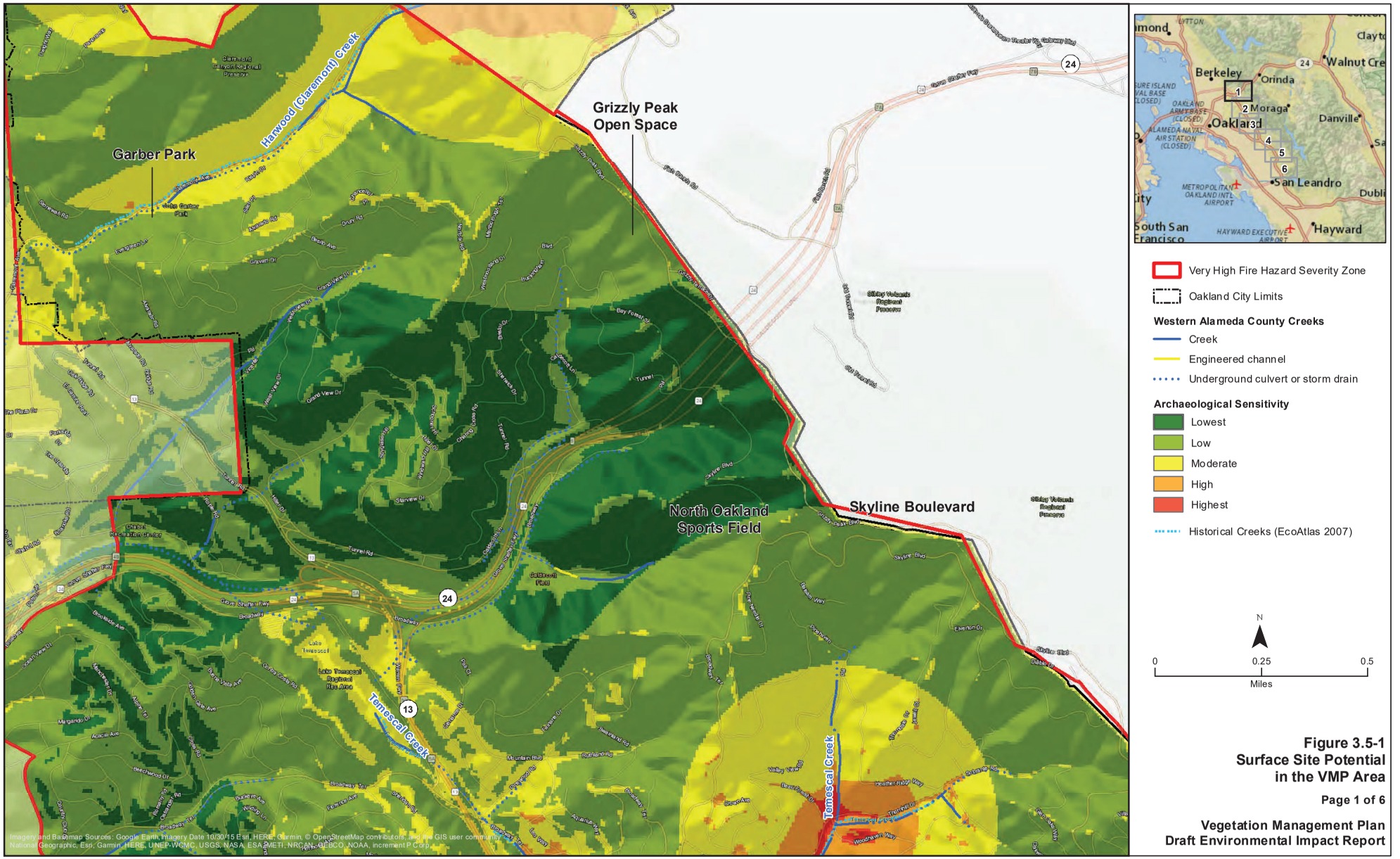

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Figure 3.5-1
Surface Site Potential in the VMP Area

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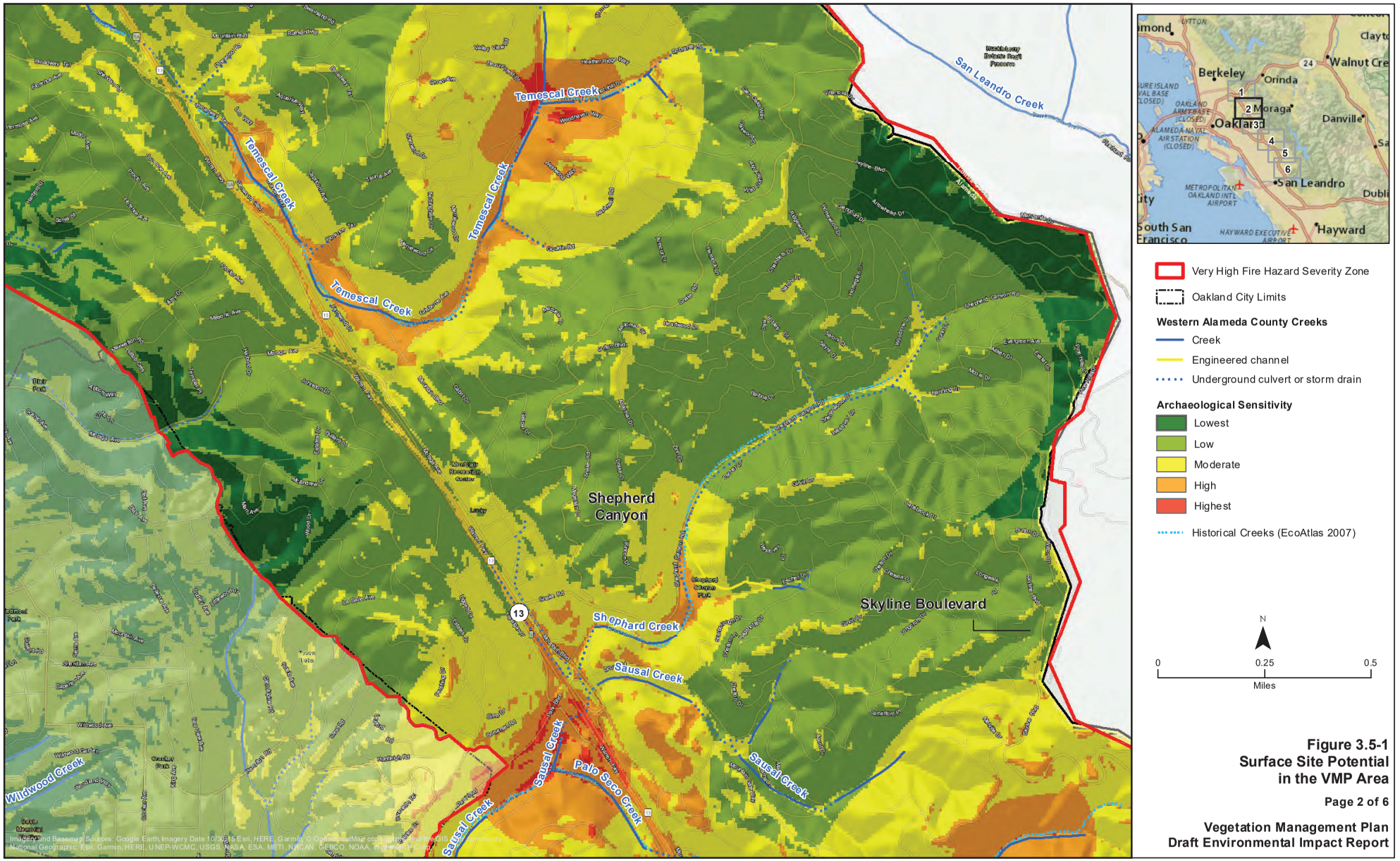

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Figure 3.5-1
Surface Site Potential in the VMP Area

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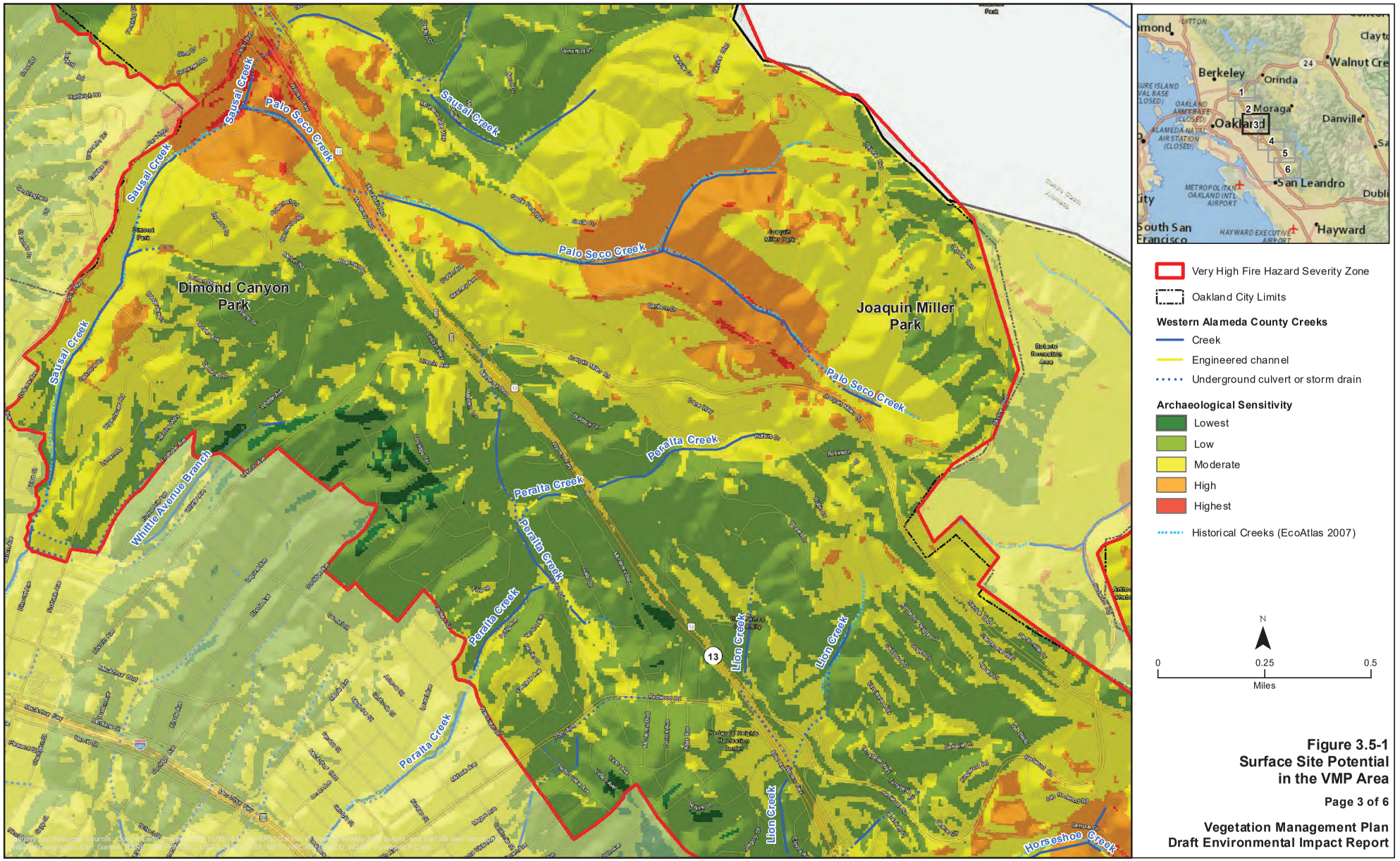

Figure 3.5-1
Surface Site Potential in the VMP Area

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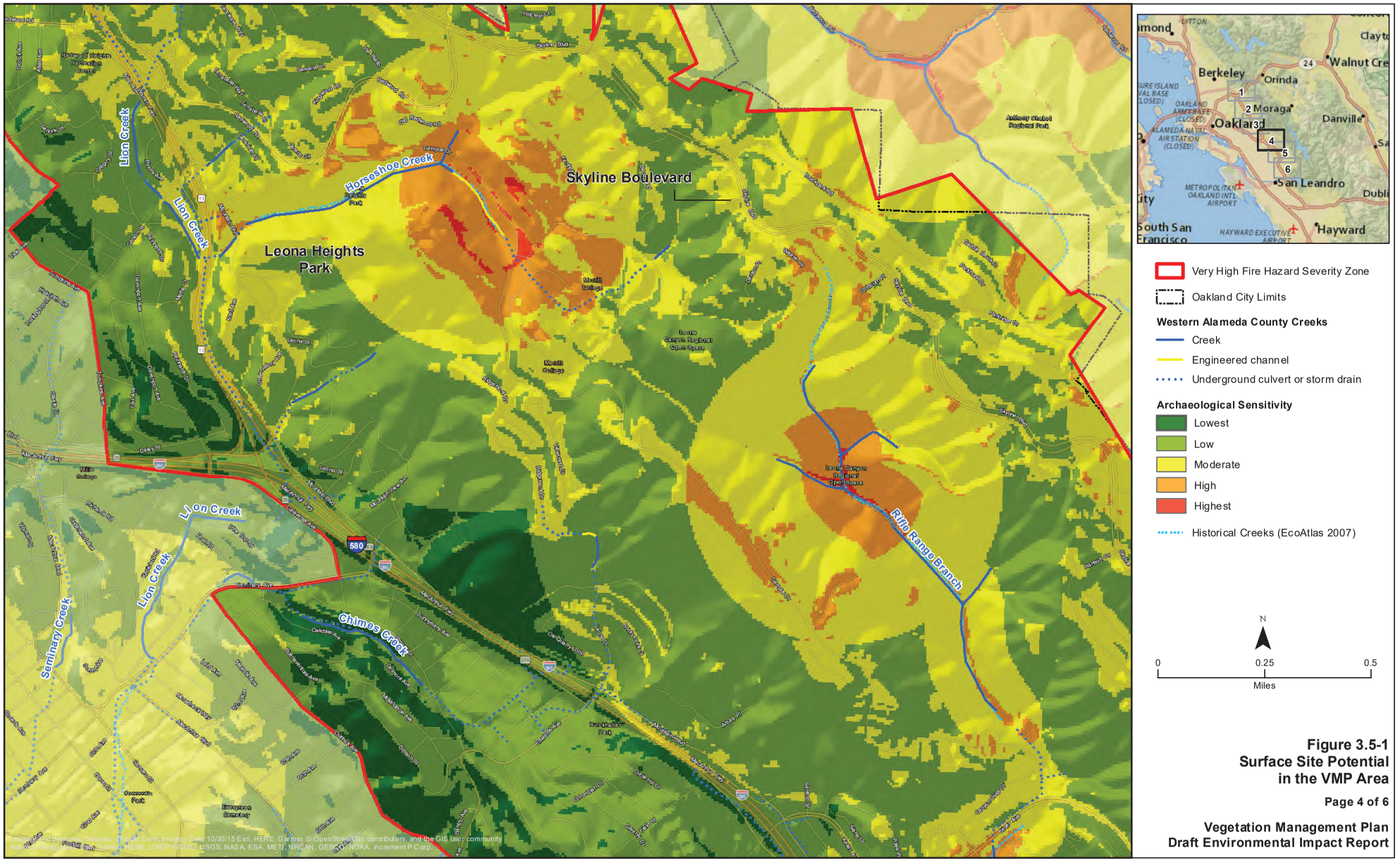

Figure 3.5-1
Surface Site Potential in the VMP Area

Vegetation Management Plan
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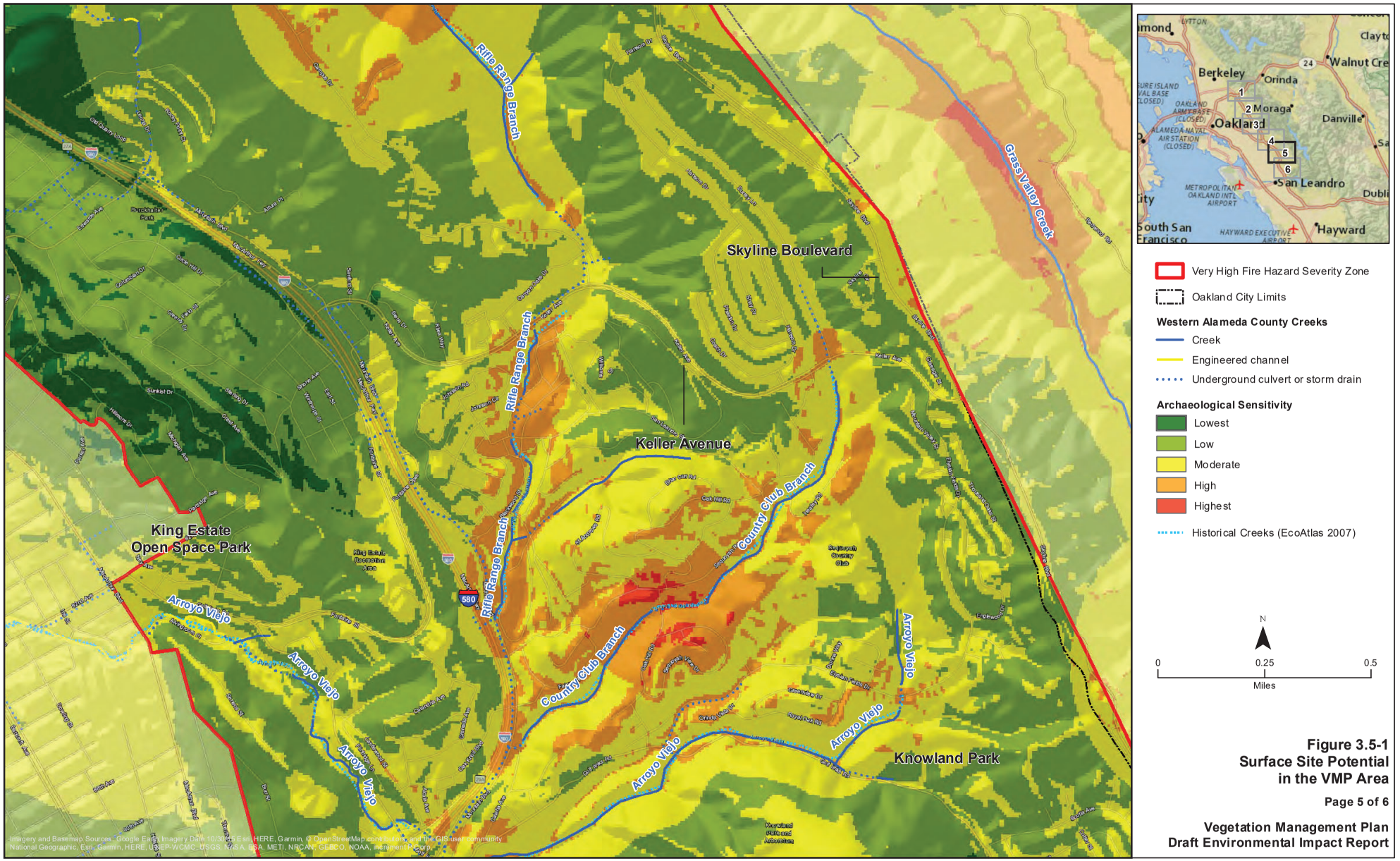

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Figure 3.5-1
Surface Site Potential in the VMP Area

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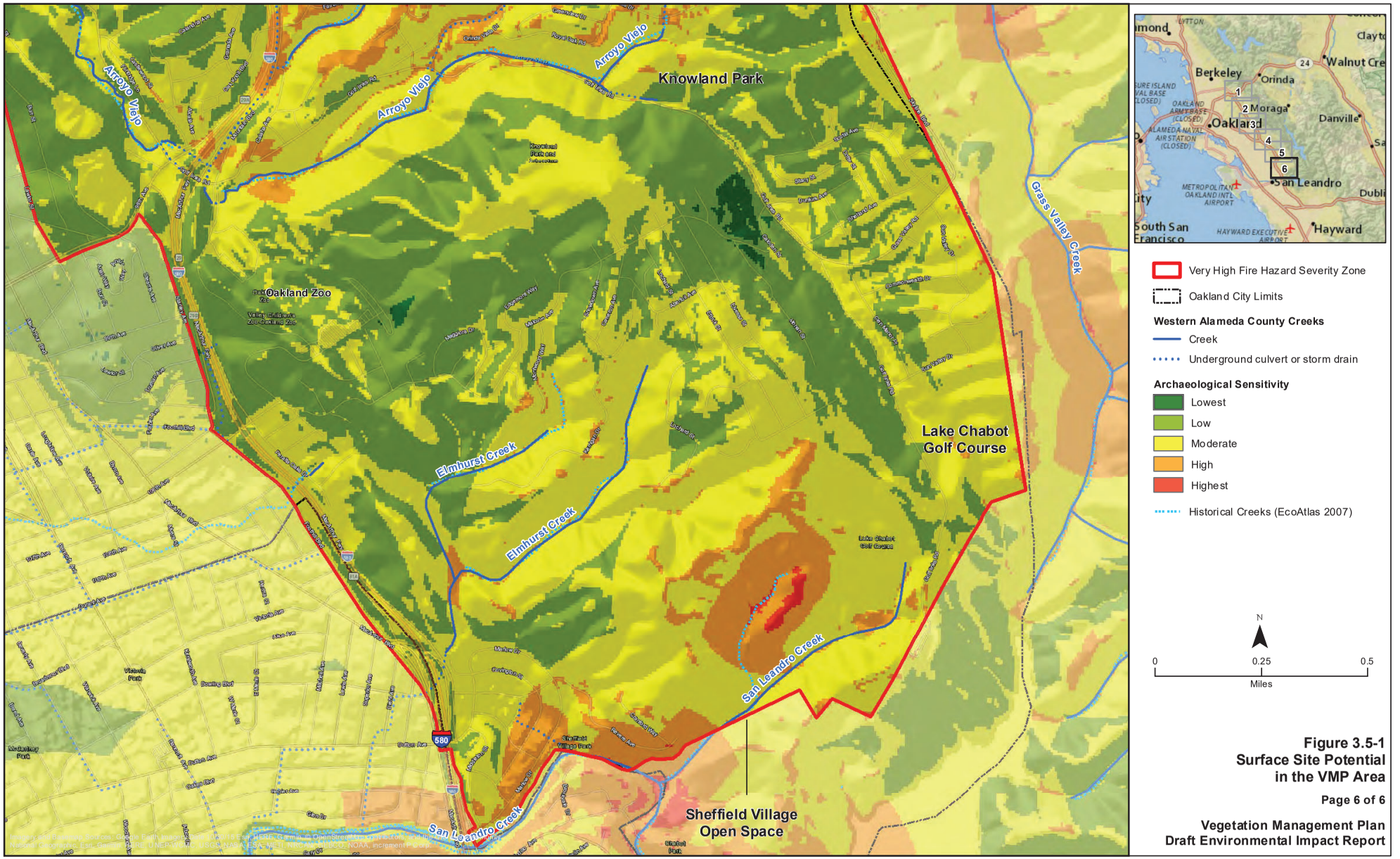

Figure 3.5-1
Surface Site Potential in the VMP Area

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Vegetation Management Plan
Draft Environmental Impact Report

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Native American Consultation

An email request was made to the Native American Heritage Commission (NAHC) on August 12, 2019, to review its files for the presence of recorded sacred sites in the VMP area. The NAHC responded on August 16, 2019, stating that no significant resources were identified in the VMP area as a result of a search of their files. The NAHC also provided a list of seven tribes and tribal contacts with a traditional and cultural affiliation with the VMP area for notification pursuant to Pub. Res. Code Section 21080.3.1 (AB 52). Coordination with tribes is described in Section 3.13, "Tribal Cultural Resources." No tribes have previously provided notice to the City of a desire to be notified of all projects, and none of the tribes that were contacted requested consultation on the VMP. Impacts to TCRs are analyzed in Section 3.13, "Tribal Cultural Resources."

Thresholds of Significance

Based on Appendix G of the CEQA Guidelines, the VMP would result in a significant impact on cultural resources if it would:

- Cause a substantial adverse change in the significance of a historical resource pursuant to CEQA Guidelines Section 15064.5;
- Cause a substantial adverse change in the significance of an archaeological resource under CEQA Guidelines Section 15064.5; or
- Disturb any human remains, including those interred outside of dedicated cemeteries.

Issues Not Evaluated Further

Vegetation management techniques include biological treatments, primarily grazing; hand labor techniques; mechanical techniques; and chemical applications (i.e., herbicides). Due to the nature of the VMP, impacts of the following vegetation management techniques would result in no impacts because they do not involve ground disturbance or impacts to structures, and therefore are not discussed further in this section:

- Hand labor techniques, except for the use of shovels, Pulaski hoes, and McLeod fire tools
- Herbicides

It should be noted that tribal consultation did not result in identification of TCRs related to locations of plants important to Oakland-area tribes.

Environmental Impacts

Impact CUL-1: Adverse Change in Significance of Historical Resources of the Historic Era and Built Environment (*Less than Significant*)

Archival research has identified 13 historic-era resources within the VMP area that have been determined significant by the City, the state, or at a national level, as summarized in **Table 3.5-4**. Five of these resources do not appear to have been evaluated for CRHR/NRHP eligibility but

may, in fact, meet those criteria, should they be evaluated in the future, and they are considered potentially eligible for the purposes of this environmental document. Furthermore, as mentioned earlier, not all of the previously recorded resources identified by the record search have been evaluated, nor has most of the VMP area been surveyed for cultural resources. As a result, it can be anticipated that the VMP area likely contains numerous as-yet-unidentified historic-era buildings and built resources that could be NRHP/CRHR-eligible and, therefore, are considered potentially eligible for the purposes of this analysis.

Table 3.5-4. Summary of Historic Resources in the VMP Area

Name	Portion of VMP Area	Significance		
		City	State	National
Joaquin Miller Park and Abbey / Tower to General John C. Fremont / CHL 107	JMP-1, JMP-2, JMP-3, JMP-4; Abbey: JMP-1; Tower: JMP-4	X	X	X
Caldecott Tunnel – Bore 3*	--	X		
Montclair Fire House*	--	X		
Dunsmuir House and Carriage House / Sheffield Village Historic District	URB-1	X	X	X
Leona Heights Park*	LHT-1, LHT-2, LHT-3	X		
Leimert Bridge*	DIM-1 (does not include bridge)	X		
George McCrea House and Indian Campground	--	X	X	X
Chrysthouse*	--	X		
Claremont Resort and Spa	--	X	X	X
Morse House	--	X	X	
Lake Chabot Clubhouse / Anthony Chabot Equestrian Center / Skyline Ranch	URB-1, Median		X	X
Redwood Regional Park Historic District / CHL 962 and 970	URB-1		X	X
Sibley Volcanic Regional Preserve / Round Top Regional Park	URB-1		X	X

* Sites potentially eligible for listing

Seven of the known historical resources are within portions of the VMP area, as shown in Table 3.5-4. Routine maintenance vegetation management activities, as described in Section 2.2.1 under "Current and Recent Vegetation Management Activities led by Oakland Fire Department," have been occurring at and around the known historical resources for decades. This work is often done in historic parks and districts with assistance of stewardship groups that are committed to maintaining the integrity of the resource/park/district, including natural and manicured landscapes.

As noted in Section 2.2.1 under "Current and Recent Vegetation Management Activities Led by Oakland Fire Department," OFD has traditionally used hand labor to manage vegetation on urban and residential parcels, roadsides, and small treatment areas within larger parks or open space areas, and these activities would continue to occur under the VMP. Within the VMP area, historic resources are considered priority 1 treatment areas, and the VMP calls for clearing flammable materials from within 30 feet of historic structures through hand techniques or manual mechanical methods. More generally, within the VMP area, all areas within 100 feet of structures are also considered priority 1 treatment areas and are managed in a similar fashion. Thus, the VMP enhances protection to all built environment resources, whether they are identified as culturally significant or not.

Vegetation management activities specific to the Joaquin Miller Park and Sheffield Village Open Space historic districts are called out in Table 2-8 in Chapter 2, *Project* Description. These techniques include hand or manual labor for removal of all vegetation within 100 feet of structures at both parks. Mechanical removal of trees is proposed for Joaquin Miller Park within 300 feet of structures, and grazing is proposed in flashy fuel areas. Hand labor would be used to remove trees within 300 feet of structures at Sheffield Village Open Space, and grazing would also be used in grassy areas and flashy fuel locations. These techniques are currently used to manage vegetation around these parks and, in particular, around the built environment contributors to the historic districts.

Conclusion

Within the VMP area, historic-era resources and buildings are considered priority 1 treatment areas. Application of the management standards outlined in Section 9.1 of the VMP (**Appendix A**, *Draft Vegetation Management Plan,* of this DEIR) would safely protect these resources from the impacts of fire. As a result, the priority 1 treatment projects described in the VMP would have a **less than significant** impact on known historical resources of the historic era and built environment and no mitigation is required.

Impact CUL-2: Adverse Change in Significance of Archaeological Sites that Are Historical Resources (*Less than Significant with Mitigation*)

Six previously recorded archaeological sites are known to be located within the VMP area, and others are likely present in areas that have not yet been surveyed for archaeological resources. In addition, archaeological resources are not always visible on the ground surface; therefore, ground disturbance could reveal the presence of buried archaeological resources.

As previously noted, distance to water, slope, and distance to a confluence of streams have been identified as the principal characteristics applicable to the sensitivity of an area to contain archaeological deposits. The terrain of the VMP area is characterized by eleven drainages that

run generally east to west or northeast to southwest, downward from the summit ridgeline that roughly parallels Grizzly Peak Boulevard and Skyline Drive. The presence of so many streams would indicate that there is a high probability of archaeological resources on VMP lands; however, this prediction is countered by knowledge that these creeks generally converge into a few larger creeks in the lower plain below the VHFHSZ, where large Native American settlements are known to occur. Furthermore, the lands within the VMP area are generally very steeply sloped. The steepest slopes in the VHFHSZ have gradients up to 62 degrees (186 percent), although most of the area has slope gradients of less than 27 degrees (50 percent) and the mean slope gradient for the area is 16 degrees (29 percent) (Dudek 2019). A study for Napa County (Watershed Information & Conservation Council 2010) determined that locations with a slope of less than 15 percent were the most sensitive for archaeological resources (highest sensitivity), while areas with a slope of 15-20 percent were considered to be of high sensitivity. Generally, slopes of 20-30 percent were of moderate sensitivity, while those of 30-40 percent were of low sensitivity. Slopes of 40 percent or more were considered to have the lowest sensitivity for archaeological deposits. Based on the Napa County study, the VMP area largely falls within the categories of moderate to low sensitivity for archaeological resources.

Application of the sensitivity model for the presence of archaeological resources within the VMP area is depicted in Figure 3.5-1. **Table 3.5-5** lists the percentages of land by sensitivity for the entire VMP area. The vast majority of the region has a moderate sensitivity, while 15 percent of the acreage is identified as high or highest sensitivity.

Table 3.5-5. Acreage According to Sensitivity Ranking for the VMP Area

Sensitivity Ranking	Total Acres in VMP Area	% of Total Acres
Lowest	122	5
Low	703	31
Moderate	1,095	49
High	302	14
Highest	15	1

Table 3.5-6 lists the amount of acreage according to archaeological sensitivity for each of the VMP treatment areas. Not all of the treatment areas are sensitive for archaeological resources; six of the 20 VMP treatment areas (Tunnel Road Open Space, North Oakland Sports Field, Marjorie Saunders Park, McDonnell Avenue, Leona Street, and Blue Rock Court) are identified with only lowest and low rankings for sensitivity. Three treatment areas have similar rankings with minimal additional acreage (< 1 acre) identified as moderate sensitivity (Garber Park, Grizzly Peak Open Space, and Beaconsfield Canyon). The Police/Safety Department Property and King Estates treatment areas are also of low sensitivity but have somewhat more substantial amounts (2.66 and 16.40 acres, respectively) of moderately sensitive acreage. The remaining nine treatment areas, although they may contain lowest or low sensitivity lands, have acreage of moderate and high sensitivity; four of these (Dimond Canyon Park, Joaquin Miller Park, Leona Heights Park, and Sheffield Open Space) also contain land with high and highest sensitivity.

Table 3.5-6. VMP Treatment Projects and Archaeological Sensitivity by Acres

VMP Treatment Area	Priority	Acres According to Archaeological Sensitivity				
		Lowest	Low	Moderate	High	Highest
Garber Park						
GAR-1	1	--	0.46	0.87	--	--
GAR-2	1	--	0.27	0.04	--	--
GAR-3	1	--	0.65	--	--	--
Grizzly Peak Open Space						
GPO-1	1	12.09	15.23	0.40	--	--
GPO-2	2	9.83	9.11	--	--	--
GPO-3	3	9.19	0.41	--	--	--
GPO-4	3	2.42	17.47	--	--	--
Tunnel Road Open Space						
TRO-1	1	3.21	1.14	--	--	--
North Oakland Sports Field						
NOR-1	1	16.66	5.00	--	--	--
NOR-2	2	7.72	--	--	--	--
NOR-3	3	11.67	6.85	--	--	--
Shepard Canyon Park						
SHP-1	1	--	6.79	5.09	0.43	--
SHP-2	1	--	4.59	4.45	0.04	--
SHP-3	2	--	2.11	9.06	0.45	--
SHP-4	3	--	7.39	11.36	1.39	--
Beaconsfield Canyon						
BCN-1	1	--	1.51	--	--	--
BCN-2	2	--	1.85	0.03	--	--
Marjorie Saunders Park						
MJS-1	1	--	0.79	--	--	--
MJS-2	2	--	1.60	--	--	--
Dimond Canyon Park						
DIM-1	1	--	0.22	1.61	1.02	0.41
DIM-2	1	--	0.54	1.15	0.02	--
DIM-3	1	--	0.25	0.42	--	--

VMP Treatment Area	Priority	Acres According to Archaeological Sensitivity				
		Lowest	Low	Moderate	High	Highest
Joaquin Miller Park						
JMP-1	1	--	17.98	63.83	31.38	0.42
JMP-2	1	--	3.33	13.57	1.08	--
JMP-3	2	--	1.63	9.79	2.38	--
JMP-4	3	--	1.66	42.31	22.96	1.29
Leona Heights Park						
LHT-1	1	--	0.69	10.66	1.66	--
LHT-2	1	--		0.54	1.24	0.04
LHT-3	2	--	--	3.21	0.55	--
McDonnell Avenue						
MCD-1	1	--	0.80	--	--	--
Police/Safety Department Property						
PSD-1		--	4.45	2.64	--	--
PSD-2	1	--	0.45	0.02	--	--
Leona Street						
LST-1	1	0.22	0.09	--	--	--
Blue Rock Court						
BLU-1	1	1.66	0.36	--	--	--
BLU-2	2	0.36	0.10	--	--	--
BLU-3	3	6.2	0.15	--	--	--
Oak Knoll						
OKN-1	1	--	0.55	0.59	--	--
OKN-2	3	--	4.99	8.50	0.77	--
King Estates						
KES-1	1	0.43	9.63	4.90	--	--
KES-2	3	1.53	52.34	11.50	--	--
Knowland Park and Arboretum						
KNO-1	1	0.08	16.40	10.47	0.42	--
KNO-2	1	--	1.95	5.06	1.34	--
KNO-3	2	--	9.60	4.29	0.02	--
KNO-4	2	0.55	21.49	9.40	0.64	--
KNO-5	3	0.35	203.45	156.13	6.96	--

VMP Treatment Area	Priority	Acres According to Archaeological Sensitivity				
		Lowest	Low	Moderate	High	Highest
Sheffield Village Open Space						
SHF-1	1	--	5.19	14.91	3.27	--
SHF-2	2	--	1.29	3.50	1.35	--
SHF-3	3	--	44.01	176.52	62.17	3.95
Urban and Residential Parcels						
URB-1	1	12.31	21.81	7.5	1.54	0.42
Medians						
MEDIAN	1	0.11	2.49	1.94	0.51	--

As previously noted, six known archaeological sites are present within the VMP area. One of these resources (Skyline Ranch) has previously been evaluated as eligible for listing in the CRHR/NRHP and another (Leona Heights Sulfur Mine/ McDonell Sulfur Mine) has previously been determined to be ineligible for listing; the remaining four sites have not been evaluated. All four of these unevaluated sites are in the VMP treatment area for project SHF-3, which involves grazing. These sites are described below:

- Site P-01-011995 is a historic refuse scatter consisting of sheet metal, a broken concrete container, stove parts, and a fence post. While it is unlikely that the site would be found significant, a definitive statement on its eligibility should be made in order to conduct grazing, as animals walking through the area could move or break the surface artifacts present.
- Site P-01-011997, a stone quarry, should similarly be evaluated.
- Site P-01-011999 is a dirt access road; grazing would not damage this site, but its eligibility should be determined.
- Grazing also would not affect site P-01-011200, which is a landfill comprised of the debris resulting from the collapse and demolition of the Cypress Structure due to the Loma Prieta earthquake in 1989. This site has been intentionally capped; therefore, it is protected from disturbance from grazing or any other surface techniques that would be implemented under the VMP.

Additional archaeological sites (surface or subsurface) are undoubtedly located within the VMP area, and likely within the VMP treatment areas as well. These sites could be adversely affected by treatment activities that cause ground disturbance, especially if the activities occur in areas ranked high and highest for archaeological sensitivity. However, site types relative to the kind of activity planned should be analyzed, as not all archaeological sites would be equally affected by the various techniques.

Grazing could adversely affect archaeological sites as large numbers of animals would be concentrated in restricted areas. Hooves can churn up the ground and move artifacts both horizontally and vertically within the treatment area. Artifacts can also be broken.

Mechanical techniques such as grading, disking, and yarding, as described in Chapter 2, can disturb the ground up to a depth of about 1 foot, and can damage both surface and subsurface archaeological remains. These activities can also move archaeological materials horizontally, as can mowing.

Most hand labor techniques generally would not be expected to affect archaeological deposits; however, damage could result if shovels, Pulaski hoes, or McLeod fire tools are used. Use of these implements could break artifacts and disturb the vertical integrity of surface archaeological sites or subsurface materials.

Mitigation Measures

Mitigation Measure CUL-1: Provide Sensitivity Training, Assess Archaeological Sensitivity, and Survey Areas of High or Highest Sensitivity.

Although vegetation management activities can occur all year round, the City will ensure that City workers and members of stewardship groups who assist with implementing the VMP will receive informal training in the form of a brochure to educate them about the need to avoid and protect significant archaeological resources. The material will be developed by a qualified archaeologist meeting the U.S. Secretary of the Interior's guidelines for professional archaeologists. The material will include relevant information regarding sensitive cultural resources, including applicable regulations, protocols for avoidance, and consequences of violating state laws and regulations. The material will also describe appropriate avoidance and minimization measures for resources that could be discovered and will outline what to do and whom to contact if potential archaeological resources or artifacts are encountered. The requirement for confidentiality and culturally appropriate treatment of any finds of significance to Native Americans, consistent with Native American tribal values, will be underscored.

During development of the VMP annual work plan, the maps that depict the archaeological sensitivity of each treatment area will be reviewed by OFD and compared to the proposed VMP treatment activities. If the work plan includes ground-disturbing techniques in areas identified as having high or highest sensitivity, either the work plan will be modified to use non-ground-disturbing techniques or the treatment area will be surveyed by a qualified archaeologist. If archaeological resources are identified, Mitigation Measure CUL-2 will be implemented.

Mitigation Measure CUL-2: Avoid Use of Techniques that Cause Ground Disturbance within Known Archaeological Historical Resources.

One known archaeological site (Skyline Ranch) that appears eligible for listing in the CRHR/NRHP exists within the VMP area, and four previously recorded sites in the VMP area have not been evaluated for eligibility. Additionally, other sites may be identified in the future during VMP-related activities or through cultural resources studies for other City projects. Archaeological sites that have been identified but not evaluated can be

treated by avoidance or by conducting an evaluation study. If a site is evaluated and determined not to be eligible for listing in the CRHR/NRHP, future avoidance of any kind is not required. If a site is found to be eligible, preservation in place is the preferred treatment under Section 15126.4(b)(3) of the CEQA Guidelines. As such, grazing and mechanical techniques, along with hand labor activities that cause ground disturbance, would not be implemented within the site boundaries and a 10-foot buffer. Alternatively, though not preferred, data recovery studies of eligible sites could take place, and the OFD would then be able to use any VMP method deemed appropriate.

Mitigation Measure CUL-3: Response Measures for Potential Unknown Archaeological Resources and Tribal Cultural Resources.

If evidence of any subsurface archaeological features or deposits (e.g., lithic scatters, midden soils, historic era mining, farming, or construction materials) is discovered during VMP treatment activities, all ground-disturbing activity in the area of the discovery shall be halted within 50 feet of the find until a qualified archaeologist can assess the significance of the find and make recommendations. If the finds are of Native American origin, a Native American representative from a traditionally and culturally affiliated tribe will be notified and invited to assess the significance of the find and make recommendations in collaboration with the archaeologist. If the site can be protected in place and avoided, no further action is necessary. Further evaluation for CRHR eligibility and treatment will be required if the resource cannot be protected and avoided. Such evaluations shall be conducted by a qualified archaeologist and, if the site is of Native American origin, in consultation with a Native American representative from a tribe with a traditional and cultural affiliation with the project area.

If, after evaluation, a resource is considered significant, or is considered a tribal cultural resource, all preservation options shall be considered as required by CEQA (see Pub. Res. Code Section 21084.3), including avoidance of the resource, possible capping, data recovery, and/or mapping. Treatment that preserves or restores the cultural character and integrity of a tribal cultural resource may include tribal monitoring, culturally appropriate recovery of cultural objects, and reburial of cultural objects or soil.

If artifacts are recovered from significant prehistoric archaeological resources or tribal cultural resources, the first option shall be to transfer the artifacts to an appropriate tribal representative. If possible, accommodations shall be made to re-inter the artifacts near the site. If no other options are available, recovered prehistoric archeological material will be housed at a qualified curation facility.

The results of the identification, evaluation, and/or data recovery program for any unanticipated discoveries shall be presented in a professional-quality report that details all methods and findings, evaluates the nature and significance of the resources, analyzes and interprets the results, and distributes this information to the public.

Conclusion

Implementation of the following mitigation measures would reduce significant impacts on archaeological historical resources. Mitigation Measure CUL-1 (Provide Sensitivity Training, Assess Archaeological Sensitivity, and Survey Areas of High or Highest Sensitivity) would provide

City and volunteer workers with information about identifying archaeological resources, assess treatment areas for archaeological sensitivity, and inspect areas of high and highest sensitivity for the presence of archaeological resources. Mitigation Measure CUL-2 (Avoid Use of Techniques that Cause Ground Disturbance Within Known Archaeological Historical Resources) would ensure that archaeological sites would be protected from disturbance by VMP techniques. Mitigation Measure CUL-3 (Stop Work if Cultural Remains Are Unearthed and Work with Local Native American Tribes if the Site Is Determined to Be a Tribal Cultural Resource) would ensure that archaeological resources discovered during implementation of the VMP would be protected in place or evaluated, and that Native American tribes would be consulted if the discovered site reflects Native American lifeways. With implementation of Mitigation Measures CUL-1 through CUL-3, potential effects on archaeological and historical resources in VMP treatment areas would be **less than significant with mitigation**.

Impact CUL-3: Disturb Human Remains, Including Those Interred Outside of Dedicated Cemeteries (*Less than Significant with Mitigation*)

No locations with human remains are currently known to exist on lands within the VMP area; however, burials may be identified during the course of pre-maintenance surveys or discovered as the result of ground-disturbing activities, such as those listed in Impact CUL-2. Although unlikely, particularly due to terrain and general geographical locations of VMP treatment areas, ground disturbance could uncover human remains. Implementation of **Mitigation Measure CUL-4 (Stop Work if Human Remains Are Unearthed during Project Activities)** would reduce potential disturbance of human remains by ensuring compliance with the California Health and Safety Code. Therefore, impacts of the VMP on human remains would be **less than significant with mitigation.**

Mitigation Measures

Mitigation Measure CUL-4: Stop Work if Human Remains Are Unearthed during Project Activities.

California law protects Native American human burials, skeletal remains, cremated remains, and items associated with Native American burials from vandalism and inadvertent destruction. Consistent with the California Health and Safety Code Sections 7050.5 and 7052 and the California Native American Historical, Cultural, and Sacred Sites Act, if suspected human remains are found during treatment activities, potentially damaging ground-disturbing activities within 50 feet of the remains will be halted immediately, and the Alameda County Coroner shall be notified immediately to determine the nature of the remains. The Coroner shall examine all discoveries of suspected human remains within 48 hours of receiving notice of a discovery (Health and Safety Code Section 7050.5[b]). If the remains are determined to be those of a Native American, the Coroner shall contact the NAHC by phone within 24 hours of making that determination (Health and Safety Code Section 7050.5[c]). The NAHC shall then assign a most likely descendant (MLD) to serve as the main point of Native American contact and consultation. Following the coroner's findings, the MLD, in consultation with the City, shall determine the ultimate treatment and disposition of the remains and take appropriate steps to ensure that additional human interments, if present, are not disturbed. The responsibilities for acting upon notification of a discovery of Native

American human remains are identified in the California Native American Historical, Cultural, and Sacred Sites Act.

Conclusion

With the implementation of Mitigation Measure CUL-4, the potential to disturb human remains, including those interred outside of designated cemeteries would be **less than significant with mitigation**.

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3.6 GEOLOGY, SOILS, AND SEISMICITY

This section discusses existing conditions and evaluates the VMP's effects related to geology, soils, seismicity, and paleontological resources. It also describes applicable federal, state, and local regulations related to geology, soils, seismicity, and paleontological resources.

3.6.1 Environmental Setting

Regional Geology

The VMP area is located within the Northern California Coast Ranges, a part of the California's Coast Ranges Geomorphic Province, a highly seismically active area with northwest-trending ranges with low mountains and valleys (CDOC 2002). The geologic structure in the area is directly related to tectonic processes between the Calaveras and Hayward Fault Zone. The Hayward Fault Zone stretches from San Jose northwest along the foothills of the East Bay Hills to San Pablo Bay (CGS 2010). Lateral and compressional forces along the fault have resulted in folding, and faulting and uplift of the East Bay Hills (Contra Costa County Community Development Department 2004). The VMP area is situated along the Hayward Fault Zone within the East Bay Hills, characterized as moderate to very steep-sloped ranges and interior valleys, which generally consists of exposed Franciscan complex bedrock, which becomes heavily fractured and metamorphized along the Hayward Fault (CGS 1991). The Franciscan complex consists of a mixture of rocks including chert, greenstone, sandstone, shale, and various metamorphic rocks. Rock materials of the East Bay Hills consists mostly of tilted Tertiary-aged Miocene marine sedimentary rocks and non-marine sedimentary rocks of shale and sandstone of the Great Valley Sequence (CGS 1991). A narrow band of ultramafic rocks can be found along the Hayward fault alignment.

The geology of the VMP area is shown in **Figure 3.6-1** and further described below.

Soils

Soils underlying the East Bay Hills can generally be grouped into two areas. The western foothills are primarily upland soils (Maymen, Millsholm, and Xerorthents). These upland soils are distributed throughout the hillslopes of the northern portion of the VMP area and have slopes of 30 to 75 percent. Millsholm loam is a shallow soil, less than 12 inches and has a high erosion rate with 50 to 70 percent slopes. Xerorthents consists of soil materials with high rapid runoff rates and erosion potential. These upland soils are typically well drained with high to very high runoff potential and low plasticity (Natural Resources Conservation Service [NRCS] 2020). Texture of these soils generally consists of loam, clay loam, or clay, approximately 20 to 40 inches thick before encountering bedrock.

Along the eastern side of the East Bay Hills, in the southern portion of the VMP area near Lake Chabot, soils that commonly occur include Los Osos clay loam, Millsholm loam, and Los Gatos loam. These soils are moderate to very steep sloping, overlying hard sedimentary rock formations. These soils are excessively drained. Los Gatos loam generally occurs as loam to gravelly loam 24 to 39 inches thick above bedrock (NRCS 2020). This unit is well drained with

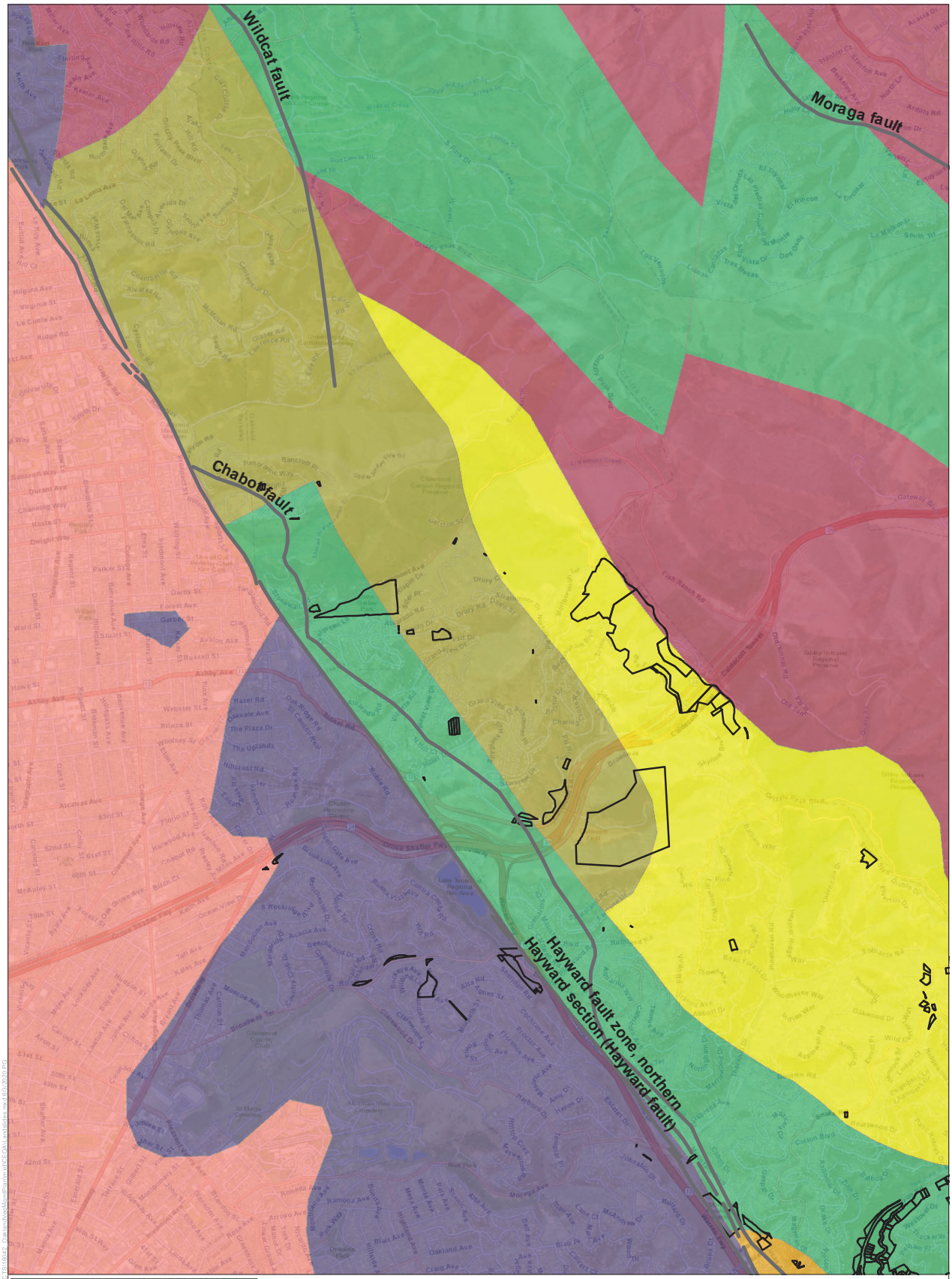
very high runoff. Los Gatos loam is highly susceptible to erosion by wind and moderately susceptible to erosion by water.

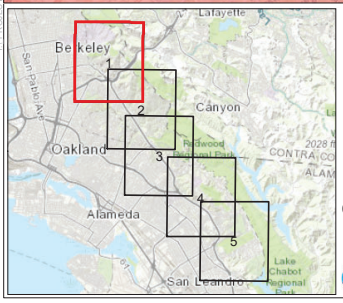
Seismicity

Alquist-Priolo Fault Zones and Faults

The San Francisco Bay area is known to be highly seismically active, including northwest-trending ranges. The Hayward Fault Zone is located along the center of the VMP area with other faults in the county associated with this fault zone. This fault is estimated to have a 31 percent probability of producing an earthquake of magnitude 6.7 or greater within the next 30 years (Field 2014).

Other faults in proximity to the VMP area include Chabot Fault (0 mile), Moraga Fault (1.9 mile east), Miller Creek Fault (1.7 mile east), and Wildcat Fault (0.75 mile north).





Proposed Project

Program Area

Geological Landform and Age

- marine and nonmarine (continental) sedimentary rocks, Pleistocene
- marine sedimentary and metasedimentary rocks, Cretaceous
- marine sedimentary and metasedimentary rocks, Cretaceous-Jurassic
- marine sedimentary rocks, Miocene
- nonmarine (continental) sedimentary rocks, Pliocene-Pleistocene
- plutonic rocks, Mesozoic
- volcanic rocks, Tertiary

Faults

QuaternaryFaults

N

0 1,000 2,000

Feet

Horizon WATER and ENVIRONMENT

Source: ESRI 2020, USGS CGS 2007

Figure 3.6-1
Geology of VMP Area

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Figure 3.6-1
Geology of VMP Area

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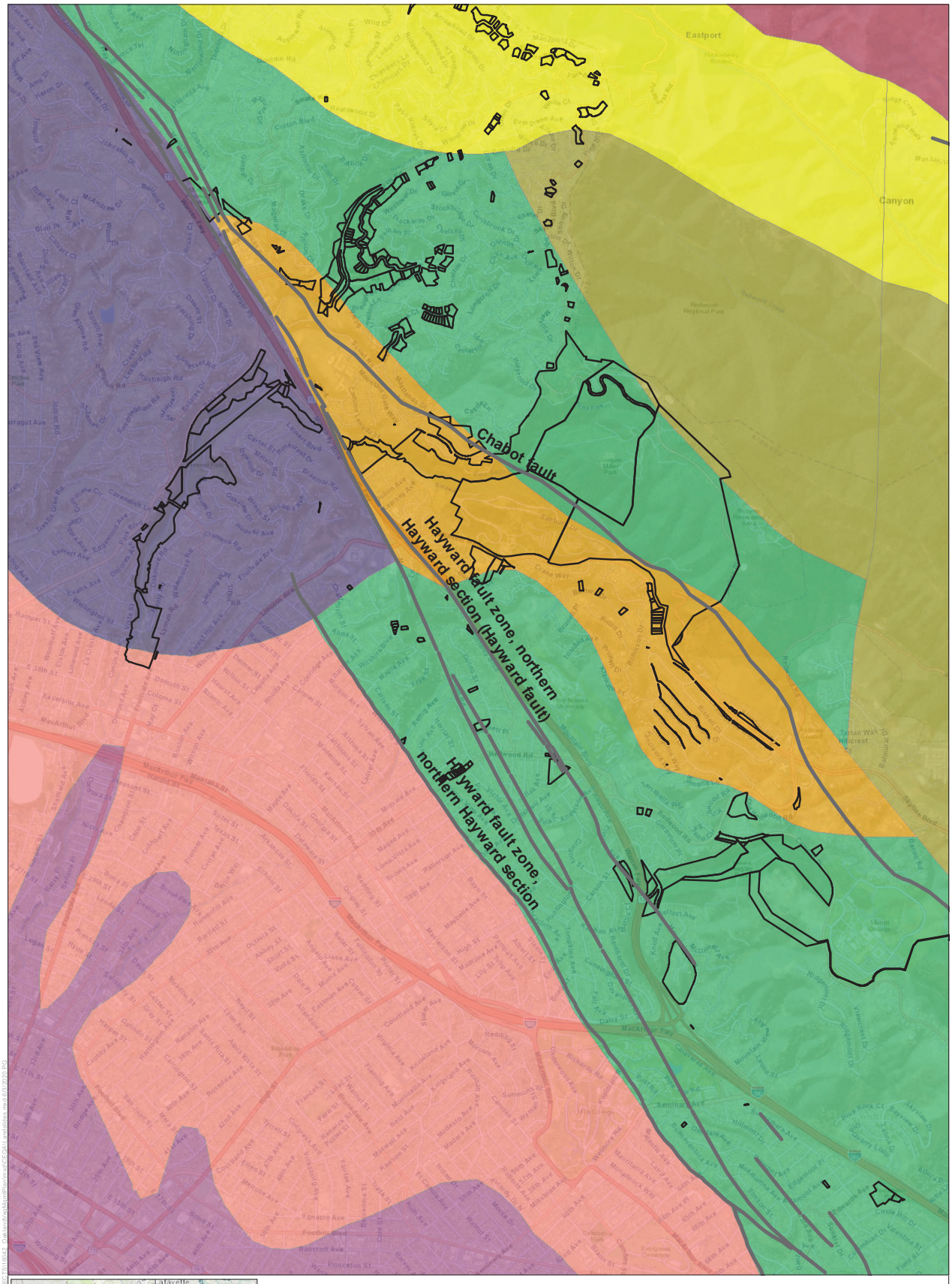

Figure 3.6-1
Geology of VMP Area

Sheet 3 of 5

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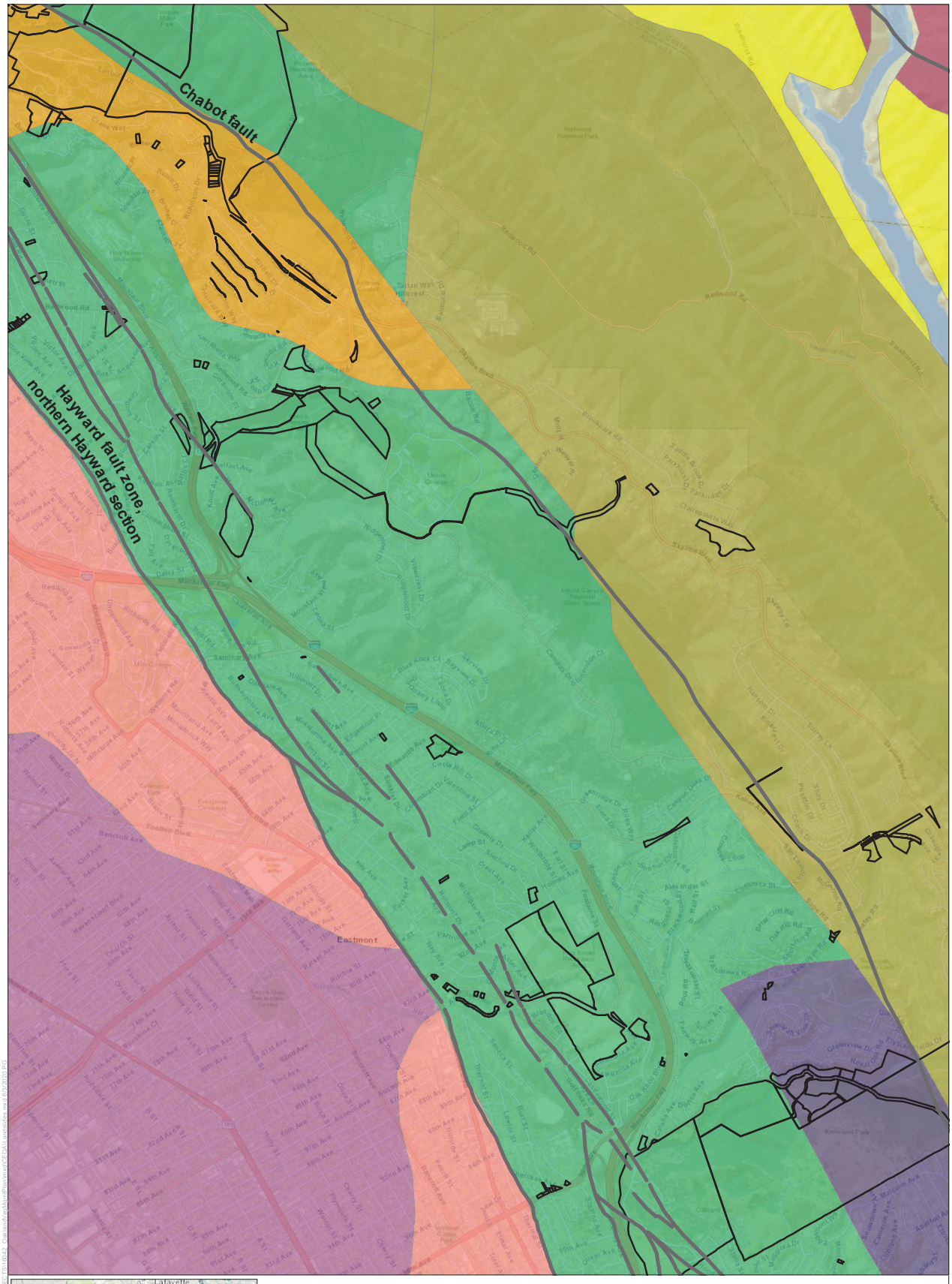

Figure 3.6-1
Geology of VMP Area

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Figure 3.6-1
Geology of VMP Area

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Ground Shaking

The severity of ground shaking experienced at a specific location depends on a variety of factors, such as the magnitude and duration of the seismic event, fault type associated with the event, distance from the epicenter, and physical properties of the underlying geology and soils. The San Francisco Bay area lies in a very seismically active region with relatively frequent and significant ground shaking events. Since ground shaking is a considerable hazard throughout the San Francisco Bay area, ground shaking can cause landslides resulting in liquefaction in the VMP area and surrounding areas. **Table 3.6-1** shows the probability for large earthquakes to occur in the region. Like other locations in the vicinity of major, active faults such as the Hayward Fault, the potential for very strong ground shaking at the VMP area is high.

Table 3.6-1. Earthquake Probability for the San Francisco Region

Magnitude (≥M)	Average Reoccurrence Interval (Years)	Likelihood of Event within 30 years
6.0	8.9	98%
6.7	29	72%
7.0	48	51%
7.5	124	20%
8.0	825	4%

Source: Field 2014

Landslides

Rock slope failure or landslides may occur in steeply sloped areas during substantial seismic events. Saturated soils and precipitation events increase the likelihood of a landslide being triggered.

The CGS compiled and created statewide landslide susceptibility maps through interpolation of historic landslide information, local geology, rock strength, and hillslope angle (methodology by Wilson and Keefer 1985 and implemented by Ponti et al. 2008) to create classes of landslide susceptibility (where 0 is low and 10 is high) (CDOC 2020). Landslide susceptibility is shown in **Figure 3.6-2**, including the relative likelihood of deep landsliding based on rock strength and steepness of slopes in the region. In general, steep slopes and weak rocks are more likely to generate landslides, while landslide susceptibility is low on very low slopes, even in weak materials. Classes VIII, IX, and X are very high landslide susceptibility and include moderate to very steep slopes in weak rock and very steep slopes in hard rock. Areas of interest within the VMP area are described below.

In general, steeper portions of the East Bay Hills have a moderate (V to VIII) to high (IX to X) susceptibility of landslides (CDOC 2020). These hillslopes are more susceptible to landslides, particularly during or soon after very wet winters when the ground is saturated for extended periods. Ground saturation increases the soil pore water content, which reduces the shear strength of the slope, which can increase the risk for landsliding. When saturated soils occur near roadways, landslides may be exacerbated by road vibration and can occur as road slip-outs.

Liquefaction

Soil liquefaction is a phenomenon that occurs when saturated sandy or silty soils lose strength during cyclic loading, such as caused by earthquakes. During the loss of strength, the soil acquires mobility sufficient to permit both horizontal and vertical movements, essentially behaving like a liquid. The factors known to influence liquefaction potential are soil type and depth, grain size, density, groundwater level, degree of saturation, and both the intensity and duration of ground shaking.

Liquefaction hazard mapping in the region indicates that the majority of upland areas in the VMP are rated very low for liquefaction hazard, with the exception of small areas such as Golf Links Road north of the Oakland Zoo (moderately low), Peralta Oaks Court (moderately low), and the area from Lyman Road (moderately low to moderate) east toward Park Boulevard (moderate) (USGS 2006).

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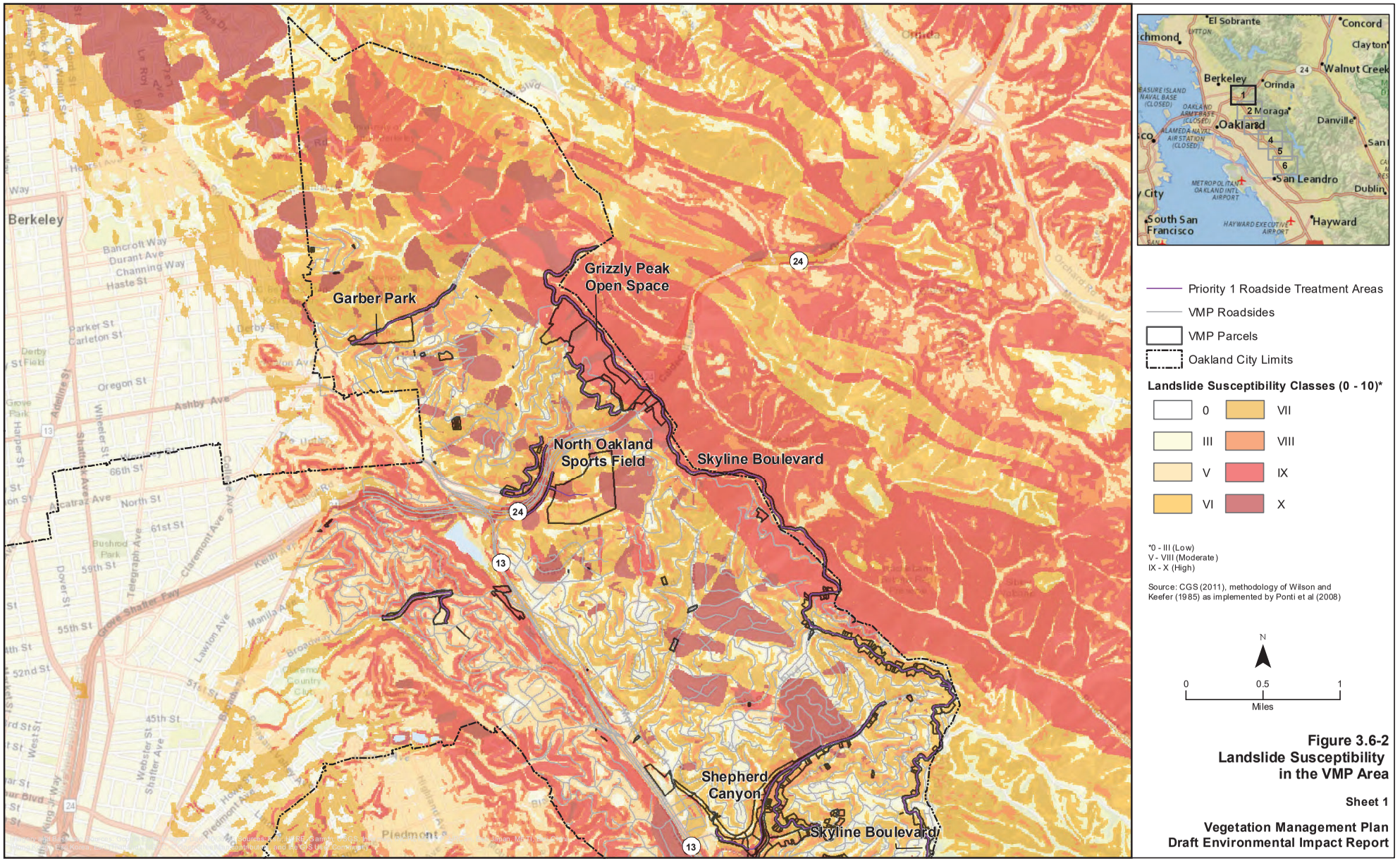

Figure 3.6-2
Landslide Susceptibility in the VMP Area

Sheet 1

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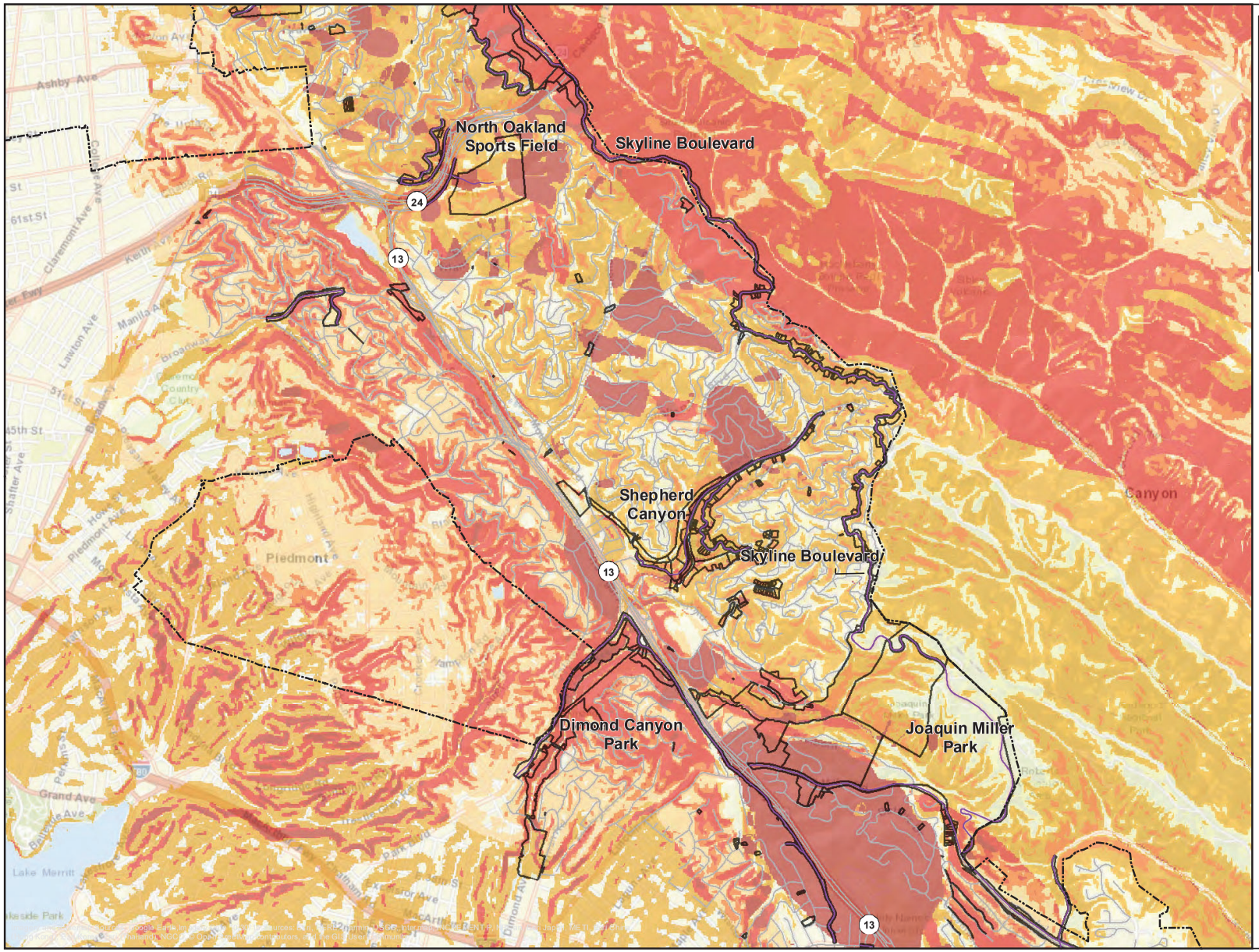

Priority 1 Roadside Treatment Areas

VMP Roadsides

VMP Parcels

Oakland City Limits

Landslide Susceptibility Classes (0 - 10)*

0	VII
III	VIII
V	IX
VI	X

*0 - III (Low)
V - VIII (Moderate)
IX - X (High)

Source: CGS (2011), methodology of Wilson and Keefer (1985) as implemented by Ponti et al (2008)

N

0 0.5 1

Miles

Figure 3.6-2
Landslide Susceptibility in the VMP Area

Sheet 2

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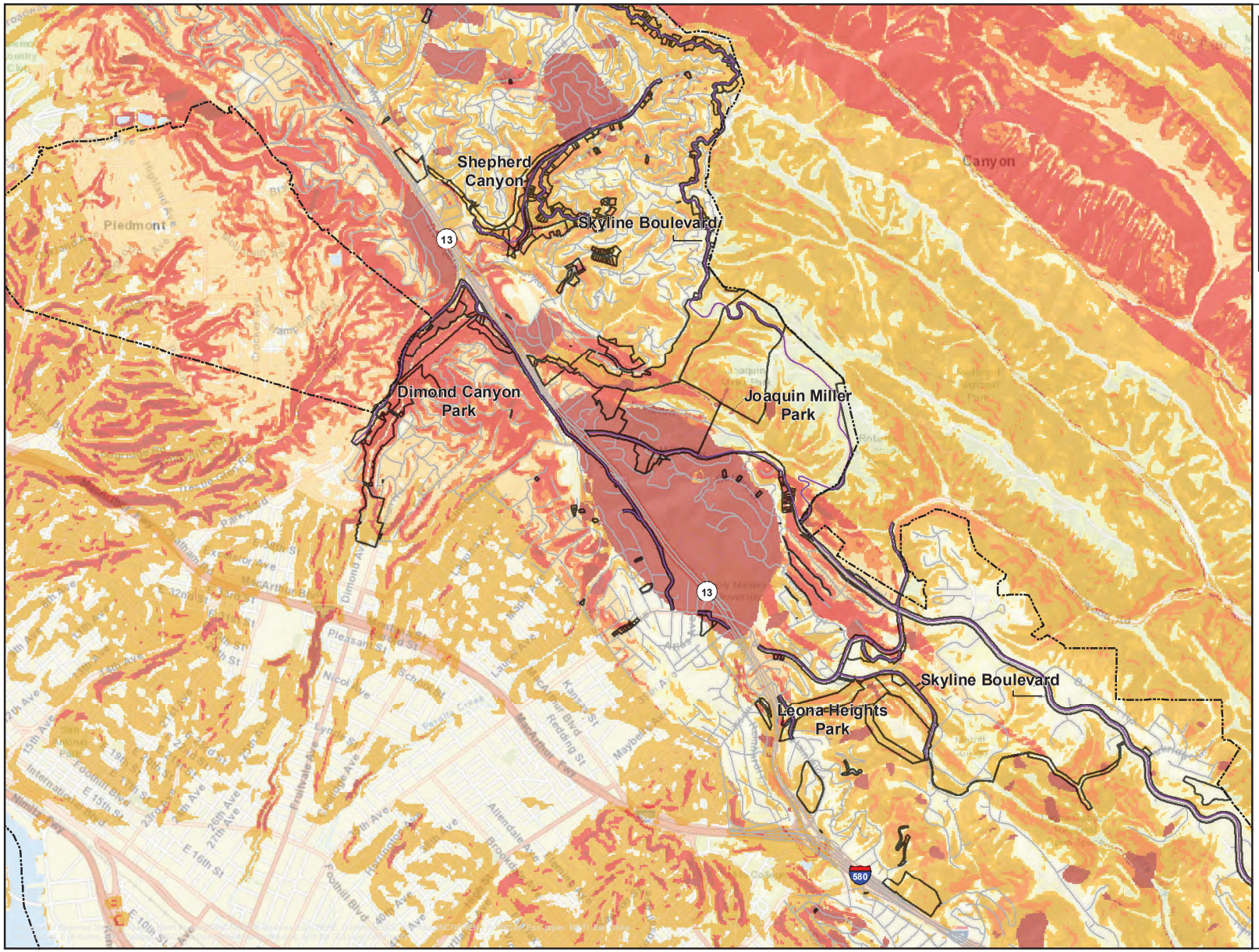

Priority 1 Roadside Treatment Areas

VMP Roadsides

VMP Parcels

Oakland City Limits

Landslide Susceptibility Classes (0 - 10)*

	0		VII
	III		VIII
	V		IX
	VI		X

*0 - III (Low)
V - VIII (Moderate)
IX - X (High)

Source: CGS (2011), methodology of Wilson and Keefer (1985) as implemented by Ponti et al (2008)

N

0 0.5 1

Miles

Figure 3.6-2
Landslide Susceptibility in the VMP Area

Sheet 3

Vegetation Management Plan
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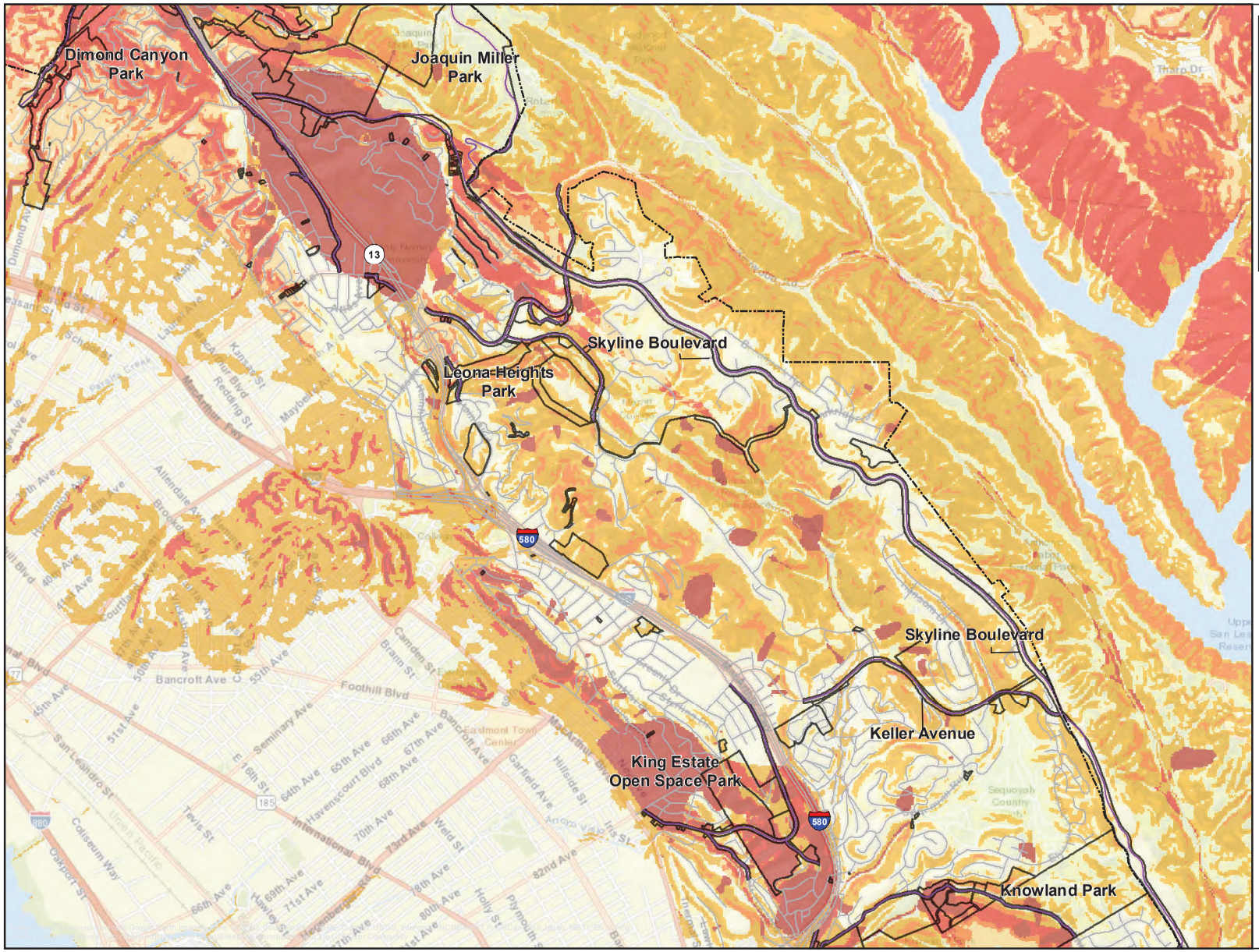

Priority 1 Roadside Treatment Areas

VMP Roadsides

VMP Parcels

Oakland City Limits

Landslide Susceptibility Classes (0 - 10)*

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V	IX
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*0 - III (Low)
V - VIII (Moderate)
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Source: CGS (2011), methodology of Wilson and Keefer (1985) as implemented by Ponti et al (2008)

N

0 0.5 1

Miles

Figure 3.6-2
Landslide Susceptibility in the VMP Area

Sheet 4

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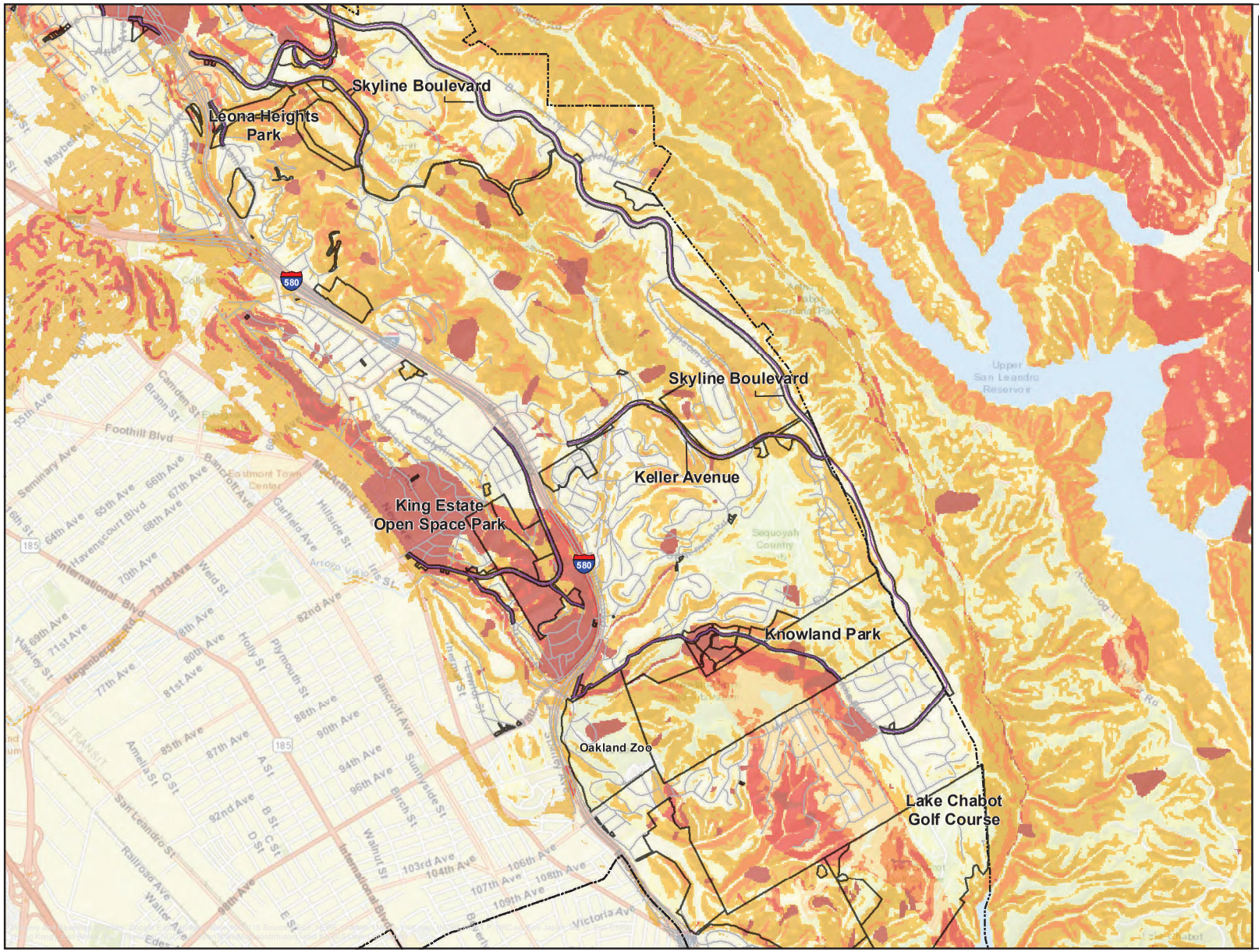

Priority 1 Roadside Treatment Areas

VMP Roadsides

VMP Parcels

Oakland City Limits

Landslide Susceptibility Classes (0 - 10)*

0	VII
III	VIII
V	IX
VI	X

*0 - III (Low)
V - VIII (Moderate)
IX - X (High)

Source: CGS (2011), methodology of Wilson and Keefer (1985) as implemented by Ponti et al (2008)

N

0 0.5 1

Miles

Figure 3.6-2
Landslide Susceptibility in the VMP Area

Sheet 5

Vegetation Management Plan
Draft Environmental Impact Report

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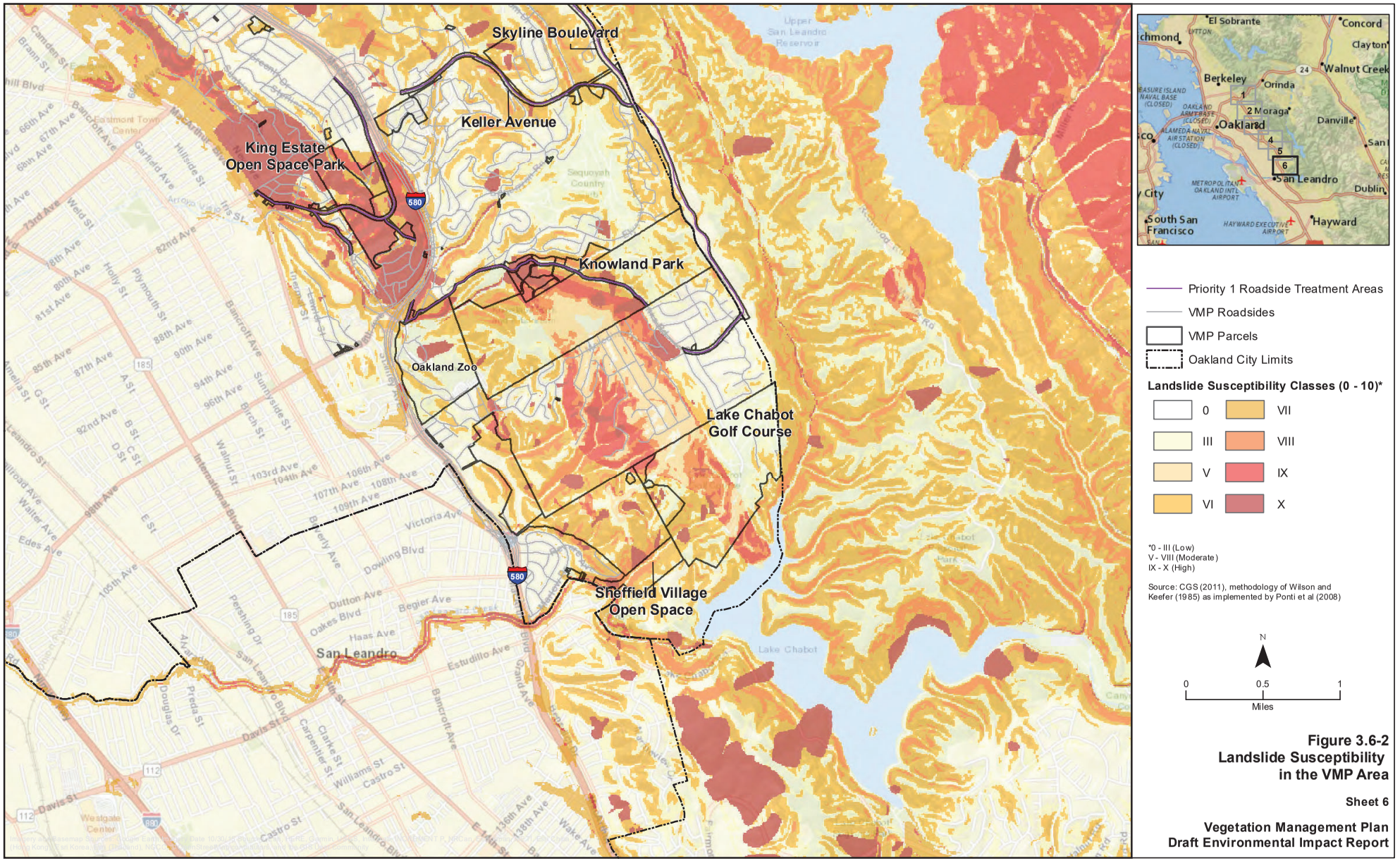

Figure 3.6-2
Landslide Susceptibility in the VMP Area

Sheet 6

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Paleontological Resources

A paleontological resource is defined as fossilized remains of vertebrate and invertebrate organisms, fossil tracks, and plant fossils. In California, paleontological resources are generally observed in sedimentary and metasedimentary deposits. Based on a database query of the University of California Museum of Paleontology in search of paleontological discoveries, 533 recorded collections were found within Alameda County. Specimens included plant material, invertebrates, microfossils, and vertebrates; and were found in geologic formations listed below (University of California Museum of Paleontology [UCMP] 2020).

Geologic formations within Alameda County with recorded[7] paleontological resources include:

- Claremont
- Claremont Shale
- Grizzly Peak
- Knoxville
- Monterey
- Orinda
- San Antonio
- Sobrante
- Unnamed Eocene

Many recorded paleontological resources had unspecified locations within the County; however, the following paleontological resource locations in the vicinity of VMP sites were recorded: Berkeley, Caldecott Tunnel, Oakland, Lake Chabot, Claremont Canyon, Round Top (UCMP 2020).

3.6.2 Regulatory Setting

Federal Laws, Regulations, and Policies

National Earthquake Hazards Reduction Act

The National Earthquake Hazards Reduction Act of 1977 (Public Law 95-124) and creation of the National Earthquake Hazards Reduction Program (NEHRP) established a long-term earthquake risk reduction program to better understand, predict, and mitigate risks associated with seismic events. The following four federal agencies are responsible for coordinating activities under NEHRP: USGS; National Science Foundation; FEMA; and National Institute of Standards and Technology. Since its inception, NEHRP has shifted its focus from earthquake prediction to hazard reduction. The current program objectives (NEHRP 2016) are as follows:

1. Develop effective measures to reduce earthquake hazards;
2. Reduce facilities and system vulnerabilities to earthquakes;
3. Improve earthquake hazards identification and risk assessment methods; and
4. Improve the understanding of earthquakes and their effects.

[7] Some collections did not specify geologic formation (UCMP 2020).

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

State Laws, Regulations, and Policies

Alquist-Priolo Earthquake Fault Zoning Act

The Alquist-Priolo Earthquake Fault Zoning Act (California Pub. Res. Code Section 2621 *et seq*.) was passed to reduce the risk to life and property from surface faulting in California. The Alquist-Priolo Act prohibits construction of most types of structures intended for human occupancy directly on or across the surface traces of active faults and strictly regulates construction in the corridors along active faults (earthquake fault zones). It also defines criteria for identifying active faults, giving legal weight to terms such as "active," and establishes a process for reviewing building proposals in and adjacent to earthquake fault zones. Under the Alquist-Priolo Act, faults are zoned and construction along or across them is strictly regulated if they are "sufficiently active" and "well defined." Before a project can be permitted, cities and counties must require a geologic investigation to demonstrate that proposed buildings would not be constructed across active faults.

Seismic Hazards Mapping Act

The Seismic Hazards Mapping Act of 1990 (Pub. Res. Code Sections 2690 et seq.) establishes statewide minimum public safety standards for mitigation of earthquake hazards. While the Alquist-Priolo Act addresses surface fault rupture, the Seismic Hazards Mapping Act addresses other earthquake-related hazards, such as strong ground shaking, liquefaction, and seismically induced landslides. Its provisions are similar in concept to those of the Alquist-Priolo Act: the State of California is charged with identifying and mapping areas at risk of strong ground shaking, liquefaction, landslides, and other corollary hazards, and cities and counties are required to regulate development within mapped seismic hazard zones. In addition, the Seismic Hazards Mapping Act addresses expansive soils, settlement, and slope stability. Under the Seismic Hazards Mapping Act, cities and counties may withhold the development permits for a site within a seismic hazard zone until appropriate site-specific geologic and/or geotechnical investigations have been carried out and measures to reduce potential damage have been incorporated into the development plans.

California Public Resources Code

Pub. Res. Code Section 5097.5 states that "no person shall knowingly and willfully excavate upon, or remove, destroy, injure or deface any historic or prehistoric ruins, burial grounds, archaeological or vertebrate paleontological site, including fossilized footprints, inscriptions made by human agency, or any other archaeological, paleontological or historical feature, situated on public lands, except with the express permission of the public agency having jurisdiction over such lands. Violation of this section is a misdemeanor." As used in this section, "public lands" means lands owned by, or under the jurisdiction of, the state, or any city, county, district, authority, or public corporation, or any agency thereof.

Local Laws, Regulations, and Policies

City of Oakland General Plan

Applicable policies and actions from the City of Oakland General Plan Safety Element (City of Oakland 2004) include the following:

Policy GE-1: Develop and continue to enforce and carry out regulations and programs to reduce seismic hazards and hazards from seismically triggered phenomena.

- **Action GE-1.2:** Enact regulations requiring the preparation of site-specific geologic or geotechnical reports for development proposals in areas subject to earthquake-induced liquefaction, settlement or severe ground shaking, and conditioning project approval on the incorporation of necessary mitigation measures.

Policy GE-2: Continue to enforce ordinances and implement programs that seek specifically to reduce the landslide and erosion hazards.

- **Action GE-2.1:** Continue to enforce provisions under the subdivision ordinance requiring that, under certain conditions, geotechnical reports be filed and soil-hazards investigations be made to prevent grading from creating unstable slopes, and that any necessary corrective actions be taken.

- **Action GE-2.2:** Continue to enforce the grading, erosion and sedimentation ordinance by requiring, under certain conditions, grading permits and plans to control erosion and sedimentation.

- **Action GE-2.3:** Continue to enforce provisions under the creek protection, storm water management and discharge control ordinance designed to control erosion and sedimentation.

- **Action GE-2.5:** Enact regulations requiring new development projects to employ site-design and source-control techniques to manage peak storm-water runoff flows and impacts from increased runoff volumes.

- **Action GE-2.6:** Design fire-preventive vegetation-management techniques and practices for creek-sides and high-slope areas that do not contribute to the landslide and erosion hazard.

3.6.3 Impact Analysis

Methodology

Impacts related to geology, soils, seismicity, and associated hazards were evaluated based on professional standards and review of soils and geologic information for the VMP area. This analysis focused on the VMP's potential to increase the risk of personal injury, risk of loss of life, and damage to property as a result of existing geologic conditions in the VMP area. The impact analysis assumes that the risk to, or posed by, existing City facilities from seismic hazards, expansive soils, or other geologic hazards within the VMP area are part of the baseline condition

and would not be an impact of the VMP. This analysis also considers the VMP's potential impacts on paleontological resources.

Criteria for Determining Significance

Based on Appendix G of the CEQA Guidelines and the City of Oakland CEQA Thresholds of Significance, the VMP would have a significant impact related to geology, soils, and seismicity if it would expose people or structures to geologic hazards, soils, and/or seismic conditions so unfavorable that they could not be overcome by special design using reasonable construction and maintenance practices. Specifically, the VMP would result in a significant impact related to geology, soils and seismicity if it would:

- Expose people or structures to substantial adverse effects, including the risk of loss, injury, or death involving:
  - Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault (Refer to Division of Mines and Geology Special Publications 42 and 117 and Pub. Res. Code Section 2690 et seq.);
  - Strong seismic ground shaking;
  - Seismic-related ground failure, including liquefaction, lateral spreading, subsidence, collapse; or
  - Landslides;
- Result in substantial soil erosion or the loss of topsoil, creating substantial risks to life, property, or creeks/waterways;
- Be located on a geologic unit or soil that is unstable or that would become unstable as a result of the project and potentially result in an on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse;
- Be located on expansive soil, as defined in Section 1802.3.2 of the California Building Code (2007, as it may be revised) creating substantial direct or indirect risks to life or property;
- Be located above a well, pit, swamp, mound, tank vault, or unmarked sewer line, creating substantial risks to life or property;
- Be located above landfills for which there is no approved closure and post-closure plan, or unknown fill soils, creating substantial risks to life or property;
- Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater; or

- Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.

Issues Not Evaluated Further

Due to the nature of the VMP, there would be no impacts related to the following significance criteria and, therefore, these significance criteria are not evaluated further:

- **Rupture of a known earthquake fault**. The Hayward Fault runs through the VMP area and is the only fault in the plan's vicinity that is recognized by the Alquist-Priolo Earthquake Fault Zoning Act. However, the VMP would not directly or indirectly cause substantial adverse effects involving rupture of a known earthquake fault or strong seismic ground shaking. Additionally, the VMP does not include construction of structures that could be affected by seismic or secondary seismic hazards.

- **Strong seismic ground shaking.**The VMP is located within a seismically active area. However, the VMP would not result in construction of structures and treatment techniques would not substantially increase exposure to seismic ground shaking.

- **Seismic-related ground failure, including liquefaction**. In general, the VMP area is located in upland areas and rated very low for liquefaction. As mentioned above, soils in the VMP area are well drained are therefore less susceptible to liquefaction.

- **Be located on expansive soils**.The VMP area is within the East Bay Hills, characterized as moderate to steep slopes with shallow loam soil types that have a low shrink or swell potential. Shrink-swell potential primarily affects structures and the VMP does not include construction of buildings or roadways. Therefore, the VMP would not result in substantial adverse effects related to expansive soils.

- **Be located above a well, pit, swamp, mound, tank vault, or unmarked sewer line** . These features primarily affect structures and the VMP does not include construction of buildings or roadways. Therefore, the VMP would not result in substantial adverse effects related to location above a well, pit, swamp, mound, tank vault, or unmarked sewer line.

- **Be located above landfills or unknown fill soils**. The VMP area is not located above any landfills or unknown fill soils. Therefore, no physical impact on landfills woul occur.

- **Soils incapable of supporting septic tanks or alternative wastewater disposal**. The VMP does not include construction of septic tanks or wastewater treatment systems; therefore this criterion is not applicable to the VMP.

Environmental Impacts

Impact GEO-1: Result in Substantial Erosion or Loss of Topsoil (*Less than Significant with Mitigation*)

Steeply sloped areas within the VMP area are more susceptible to erosion or loss of topsoil than less steep areas. For this EIR, erosion and loss of topsoil are evaluated together as surficial

erosion. In contrast, landslides are larger, singular mass movements; landslide potential is described further below in Impact GEO-2. Steeper hillslopes in the VMP area are more sensitive to potential erosion impacts caused by VMP activities. Additionally, the history of past land practices can influence hydrologic conditions, resulting in erosion impacts or effects to natural drainage courses. For example, soils that have been compacted provide reduced infiltration rates for precipitation, which typically results in increased overland runoff, which in turn may lead to increased erosion. Such erosion events may be exacerbated by vegetation removal if the vegetation removal is extensive, reduces the vegetative canopy to a substantial degree, and increases the extent of bare soil that would be susceptible to raindrop erosion or rilling. Because of the interaction between rainfall, surface erosion, and water quality, these issues are also discussed in Section 3.9, "Hydrology and Water Quality." The increased potential for erosion following VMP activities can contribute sediment to downstream waterways.

VMP activities may also affect the tree root structure in treatment areas. Damage to tree root structure can contribute to soil instability and increase the risk of surface erosion. In addition, the loss of plant cover and loss of input of organic matter could potentially degrade the soil structure. Additionally, soil compaction potentially due to mechanized equipment or grazing could increase runoff due to reduced rainfall infiltration, as described above, resulting in the potential for increased surface erosion. These potential effects are described further below by the proposed vegetation management techniques.

Grazing

Grazing has a relatively lower potential for ground disturbance compared to other VMP treatments; however, soil compaction, displacement, and erosion can occur from over-grazing and the development of animal trails. When areas are overgrazed, trails can develop as animals follow repeated paths of foraging and movement. Grazing trails, when they develop, can have a hydrologic effect of concentrating runoff and increasing erosion. The mechanical force from grazing animals' hooves can also compact the soil and cause soil movement in a downslope direction. As described above, soil compaction lowers the ability of the soil to infiltrate rainfall (i.e., lowered infiltration rate), which results in an increased likelihood of overland flow.

Under baseline conditions, approximately 900 acres of the VMP area are grazed annually. The VMP would increase grazing activities up to 1,100 acres per year. The VMP would thereby incrementally increase grazing-related erosion impacts. Implementation of **Mitigation Measure BIO-5 (Grazing)** would avoid, reduce, or minimize erosion impacts from grazing by monitoring livestock to prevent overgrazing. Up to 900 acres of VMP areas have been grazed annually over the last several years. During that time, grazing management has included the rotation and movement of herds to prevent overgrazing effects. The conditions in Mitigation Measure BIO-5 would provide additional measures to avoid and minimize erosion impacts by preventing overgrazing.

Mechanical Treatments

Mechanical treatment techniques have the potential to increase soil erosion and loss of topsoil where vegetation removal or other activities remove the vegetative ground cover and expose or disturb the top layer of soil. Additionally, mechanical equipment can compact soils or cause rutting, increasing erodibility of soil. The VMP includes standards to guide the areal concentration of vegetation removal. These standards would help to avoid and reduce the

potential for significant erosion. Implementation of **Mitigation Measure GEO-1 (Minimize Soil Disturbance)** would further minimize soil disturbance by limiting ground disturbance to the minimum footprint necessary to meet objectives, leaving stumps intact, and minimizing the use of mechanical equipment on steep slopes. Implementation of **Mitigation Measure GEO-2 (Erosion and Sediment Control Measures)** would minimize soil erosion and loss of topsoil by requiring erosion control measures in areas where soils are potentially disturbed. Implementation of **Mitigation Measure GEO-3 (Geotechnical Evaluation)** would reduce the potential for landslides through evaluation of potential for future landslide potential from VMP treatments by a qualified professional in situations where landslide potential is increased. This measure would also help reduce soil erosion impacts from operating equipment used during mechanical treatment activities. Implementation of **Mitigation Measure AES-2 (Staging)** would reduce the potential for erosion by requiring that equipment be staged on areas that have already been compacted or previously disturbed. Implementation of **Mitigation Measure HYD/WQ-1 (Work Windows)**, which requires that wheeled or tracked equipment used by creeks only be used when there is no flow and prohibits vegetation treatment activities within 48 hours of a significant rainfall, would further reduce soil erosion effects.

Hand Labor Treatments

In comparison to other treatments, hand labor treatments would likely have a relatively lower potential to cause soil erosion or loss of topsoil due to the smaller scale and reduced intensity of the treatment. However, removal of soil-binding roots can lead to soil exposure. As described above, implementation of Mitigation Measures GEO-1 and GEO-2 would also reduce the potential for soil erosion from hand labor treatments.

Herbicides

Herbicides would be used to remove targeted vegetation or prevent regrowth. Herbicide would be applied using the cut and daub method or by backpack sprayer. Herbicide use on herbaceous species is not proposed, with the exception of spot treatment of pampas grass and jubata grass. As broadcast herbicide application is not proposed on herbaceous groundcover, this would minimize the potential for significant soil exposure or the creation of large barren soil areas with subsequent erosion. Long-term effects of herbicide use could affect the root structure in treated areas, potentially causing root decay or instability, which could increase erosion in the longer-term. However, the increase in erosion from herbicide use is not anticipated to be significant.

Mitigation Measures

Mitigation Measure AES-2: Staging (VMP BMP GEN-4)

See text in Section 3.2, “Aesthetics.”

Mitigation Measure BIO-5: Grazing (revised from VMP BMP BIO-6)

See text in Section 3.4, “Biological Resources.”

Mitigation Measure GEO-1: Minimize Soil Disturbance (VMP BMP GEN-2)

To reduce the potential for erosion and loss of topsoil, the City and its contractors shall implement the following measures during ground-disturbing activities:

- To minimize impacts to natural resources, the City and its contractors shall limit the area of ground disturbance to the minimum footprint necessary to meet the goals and objectives of the vegetation management activity.

- Ground-disturbing activities will not occur when soils are saturated, or within one week following an inch or more of rain, unless the ground is consistently firm and can support the weight of machinery or livestock (during grazing) without creating ruts.

- The City and its contractors shall leave stumps from removed trees and shrubs intact, with stump heights not exceeding 6 inches, as measured from the uphill side.

- When heavy equipment is used, the City and its contractors shall utilize low ground-pressure equipment, to the extent feasible.

- The City and its contractors shall not use heavy equipment on unstable slope areas, slopes with gradients exceeding 65%, slopes with gradients between 50% and 65% where the erosion hazard rating is high or extreme, or slopes with gradients over 50% that lead without flattening to sufficiently dissipate water flow and trap sediment before reaching a stream or other water resource.

- The City and its contractors shall regrade or recontour any areas subject to soil disturbance from heavy equipment, including dragging or skidding of trees or other material.

Mitigation Measure GEO-2: Erosion and Sediment Control Measures (VMP BMP GEN-3)

The City and its contractors shall implement the following measures:

- Upland soils exposed by maintenance activities shall be seeded and stabilized using erosion control fabric or hydroseeding.

- Erosion control fabrics shall consist of natural fibers that biodegrade over time. No plastic or other non-porous material shall be used as part of a permanent erosion control approach. Plastic sheeting may be used to protect a slope from runoff temporarily, but only if there are no indications that special-status species would be affected by the application, as determined by a qualified biologist.

- Erosion control materials shall be absent of monofilament material or netting that can entrap wildlife.

- Erosion control measures shall be installed according to manufacturer's specifications.

- Appropriate measures include, but are not limited to, the following:

  - silt fences
  - straw bale barriers
  - brush or rock filters
  - storm drain inlet protection
  - sediment traps
  - sediment basins
  - erosion control blankets and mats
  - soil stabilization (e.g., tackified straw with seed, jute, or geotextile blankets, broadcast and hydroseeding)

- All temporary construction-related erosion control methods (e.g., silt fences) shall be removed at the completion of the project.
- The City and its contractors shall comply with California Stormwater Quality Association (CASQA) Construction BMPs guidance and specifications on implementation of the erosion control measures listed above (see also www.casqa.org/resources/bmp-handbooks/construction):
  - SC-3. Sediment Basins
  - SC-4. Straw or Sand Bag Barriers
  - SC-5. Sediment Traps
  - SC-6. Silt Fences
  - SS-1. Erosion Control Blankets, Mats, and Geotextiles
  - VR-1. Brush or Rock Filters
  - VR-4a. Temporary Outlet Protection
  - VR-4b. Storm Drain Inlet Protection
  - WD-1. Earth Dike
  - WD-1. Slope Drain
  - WD-3. Temporary Drains and Swales

Mitigation Measure GEO-3: Geotechnical Evaluation

City staff shall determine on a case-by-case basis whether to retain a qualified professional (e.g., engineering geologist or geotechnical engineer) to conduct a geotechnical reconnaissance to evaluate the potential impacts of VMP treatment activities on future landslide potential if:

- Habitable structures are located within 100 feet of the toe of the slope downhill of the treatment area and
- The prescribed treatment would include the use of heavy equipment or machinery and substantial ground-disturbing activities (i.e., this measure would not apply to methods such as hand treatment, weed eating, or herbicide treatment), and one or more of the following conditions is identified:
  - The treatment area is listed as "unstable," "many landslides" on applicable slope stability mapping; or
  - The average slope steepness of the treatment area is greater than 10 degrees (about 18 percent); or
  - There is visible evidence of landslide activity (e.g., scarps, crooked trees, landslide-generated debris piles) within the treatment area, as documented by a field reconnaissance visit.

Mitigation Measure HYD/WQ-1: Work Windows (VMP BMP GEN-1)

See text in Section 3.9, "Hydrology and Water Quality."

Conclusion

The VMP would have potential for erosion or topsoil loss due to soil disturbance and vegetation removal. Implementation of Mitigation Measures AES-2, BIO-5, GEO-1, GEO-2, GEO-3, and HYD/WQ-1 would avoid and minimize potential effects of erosion or loss of topsoil during and following VMP activities to a less-than-significant level. Therefore, impacts for erosion or loss of topsoil would be considered **less than significant with mitigation**.

Impact GEO-2: Substantial Adverse Effects Involving Landslides (*Less than Significant with Mitigation*)

Landslides can result in substantial property damage, injury, and loss of life. Landslides are more likely to occur with saturated soil conditions, and are more prone to happen during or following winter seasons with abundant rainfall. Landslides can also be triggered by earthquakes. As discussed in the environmental setting, much of the VMP is located in a region designated as highly susceptible to landslides (CDOC 2020). In addition to rainfall and earthquakes, slope instability and the likelihood for landslides is affected by several factors including geologic material and structure, slope steepness, groundwater and soil moisture conditions, soil type, land use practices, and vegetation cover conditions.

The VMP would not involve construction of habitable structures. Therefore, no additional long-term exposure to landslides beyond current conditions would occur as a result of the VMP. However, some VMP treatment techniques, such as those that occur on steep slopes, could result in increased potential for landslides.

Plant root systems provide cohesion to surface soils and reduce soil water content, which reduce the driving factors that favor landslide development. Treatment techniques resulting in the removal of vegetation (e.g., mechanical treatment, hand removal, herbicide application, etc.) could affect the root structure in treated areas such that the stability of slopes and soils could decrease, which could increase the risk for landslide. If the removal of vegetation is extensive, at a watershed scale, it can also affect soil moisture content by reducing evapotranspiration, also leading to increased soil moisture, runoff and in some specific instances increase the risk of landslides. However, such an effect generally requires a more comprehensive and wide-scale removal of vegetation than what is proposed in the VMP.

In general, regardless of vegetation management technique, areas with steeper slopes and where previous landslides have occurred are at higher risk for future landslides. Additionally, landslides can impact water quality through generation of erodible material and can result in increased sedimentation impacts to areas located below (downstream of) the VMP. These issues are discussed in more detail in Section 3.9, “Hydrology and Water Quality.” However, the widespread or complete removal of vegetation in treatment areas would not occur under the VMP, which would minimize the potential for these impacts. Vegetation treatment within the VMP area (provided in Appendix A of this DEIR) includes leaving a minimum number of trees per acre in each vegetation type and guidance on spacing between retained trees. For example, mature eucalyptus stands would be thinned to ensure 35-foot horizontal spacing between trunks, and second-growth eucalyptus stands would be thinned to reach an average 25-foot spacing between trunks.

Moderate to high severity wildfire can greatly increase the likelihood of debris sliding and debris flows (Haas et al. 2017). Wildfires can also create soil hydrophobicity, whereby rainstorms following a wildfire can result in significantly increased runoff and the potential for debris flows, which can impact people or structures that are located below an area that has burned. The VMP would reduce risks of fire, especially catastrophic fire, and thus help reduce the risk for post-fire soil hydrophobicity and resulting debris flows. This would be a beneficial impact compared to existing conditions.

Grazing

Grazing has a lower ground disturbance potential compared to mechanical techniques; however, soil compaction, displacement and erosion can occur from over grazing and the development of animal trails. While overgrazing could increase surface runoff and erosion, it would not likely contribute to increasing the risk for landsliding. Implementation of **Mitigation Measure BIO-5** would minimize the potential of landslides from grazing by monitoring livestock to ensure over-grazing does not occur.

Hand Labor Techniques

Some hand labor techniques (e.g., use of chainsaws and weed whips) include shrub removal, minor pruning, and mulch application. The potential for these types of vegetation management

activities to increase the risk of landslides is considered very minimal due to the small scale of the activity and minimal soil disturbance. The impact would be less than significant and no mitigation is required.

Mechanical Techniques

Mechanical treatment techniques would have elevated potential to create landslides from ground disturbance compared to grazing and hand labor techniques. Mechanical techniques generally including mowing, grading, tree removal, and chipping that require large mechanical equipment. Mechanical vegetation removal, especially along steep slopes and areas already prone to landslides would generate a higher potential of slope instability. For example, if many trees that were anchoring the toe of a previously active slide area were removed, the historic or previous landslide could be activated. However, the standards for vegetation treatment within the VMP (leaving a minimum number of trees per acres in each vegetation types and guidance on spacing between retained trees) would minimize this potential, because the wide scale removal of trees that could reactivate a slide area would not occur under the VMP. However, if mechanical techniques caused slope instability that could result in landslides or debris flows, resulting in impacts to habitat or infrastructure, the impacts would be potentially significant. Based on the tree removal standards proposed in the VMP, tree removal activities in the VMP would not occur at a scale or extent to result in such slope instability, landslides, or debris flows. Implementation of **Mitigation Measures GEO-1 and GEO-2** would further minimize the risk of landslides by minimizing the areas of disturbance and by implementing erosion control measures in areas where soils are disturbed. Implementation of **Mitigation Measure GEO-3** would reduce the potential for landslides through evaluation of potential for future landslide potential from VMP treatments by a qualified professional in situations where landslide potential is increased. Implementation of **Mitigation Measure AES-2** would reduce the potential for landslides by staging equipment on areas that have already been compacted or previously disturbed.

Herbicide

Herbicides would be used to kill vegetation or prevent growth. Potential to create landslides from ground disturbance from herbicide treatments is insignificant. However, long-term effects could affect the root structure in treated areas such that the stability of slopes and soils could decrease, which would increase the risk of landslide. Based on the areas where herbicide would be applied, and the standards proposed in the VMP for tree retention, herbicide application under the VMP would not occur at a scale or extent to result in slope instability, landslides, or debris flows. The increase in erosion from herbicide use is not anticipated to be significant.

Mitigation Measures

The City would implement the following mitigation measures to reduce Impact GEO-2:

Mitigation Measure AES-2: Staging (VMP BMP GEN-4)

See text in Section 3.2, “Aesthetics.”

Mitigation Measure BIO-5: Grazing (revised from VMP BMP BIO-6)

See text in Section 3.4, “Biological Resources.”

Mitigation Measure GEO-1: Minimize Soil Disturbance (VMP BMP GEN-2)

See text in Impact GEO-1 above.

Mitigation Measure GEO-2: Erosion and Sediment Control Measures (VMP BMP GEN-3)

See text in Impact GEO-1 above.

Mitigation Measure GEO-3: Geotechnical Evaluation

See text in Impact GEO-1 above.

Conclusion

The VMP is unlikely to increase the potential risk for landslides. Application of Mitigation Measures AES-2, BIO-5, GEO-1, GEO-2, and GEO-3, would provide additional impact avoidance and minimization to reduce potential effects on long-term slope instability in landslide-prone areas during and following implementation of VMP activities. Therefore, potential adverse effects involving landslides would be considered **less than significant with mitigation.**

Impact GEO-3: Directly or Indirectly Destroy a Unique Paleontological Resource or Site or Unique Geologic Feature (*Less than Significant with Mitigation*)

Some of the VMP activities (e.g., grazing, hand removal, herbicide application) would be conducted above-ground. Therefore, these treatment types would not impact paleontological resources or unique geological features. Soils would be disturbed during implementation of mechanical treatments. Mechanical treatments could disturb soils to a depth of one foot. The potential for these ground-disturbing activities to uncover, much less destroy, a previously documented or unknown paleontological resources is unlikely, since resources are usually found at least a few feet but often many feet below the ground surface. However, the possibility exists that ground disturbance could reveal the presence of a buried paleontological resource. Implementation of **Mitigation Measure GEO-4 (Stop Work if Paleontological Resources Are Unearthed during VMP Treatment Activities)** would ensure that paleontological resources discovered during implementation of the VMP would be protected in place or evaluated. The impact on unique paleontological resources from implementation of the VMP would be less than significant with mitigation.

Mitigation Measures

The City and its contractors shall implement the following mitigation measure to reduce Impact GEO-3:

Mitigation Measure GEO-4: Stop Work if Paleontological Resources Are Unearthed during VMP Treatment Activities

If evidence of any paleontological resources (e.g., fossilized remains of plants and animals) is discovered during VMP treatment activities, the City and its contractors shall halt all ground-disturbing activity within 20 feet of the find until a qualified professional paleontologist can assess the significance of the find and make recommendations. If the site can be protected in place and avoided, no further action is necessary. Further evaluation and treatment shall be required if the resource cannot be protected and

avoided. Such evaluations shall be conducted by a qualified paleontologist. Treatment may include preparation and recovery of fossil materials for an appropriate museum or university collection, and may include preparation of a report describing the finds. The City shall be responsible for ensuring that the consulting paleontologist's recommendations for treatment are implemented.

Conclusion

The VMP is unlikely to uncover, much less destroy, paleontological resources. Implementation of Mitigation Measure GEO-4 would provide additional impact avoidance and minimization during implementation of the VMP. Therefore, the potential impacts to paleontological resources and unique geological features would be **less than significant with mitigation.**

3.7 GREENHOUSE GAS EMISSIONS, CLIMATE CHANGE, AND ENERGY

This section includes an environmental setting that describes the existing greenhouse gas (GHG) emissions and climate change issues in the study area, which includes the VMP area and the broader state of California context. The environmental setting also describes energy resources that serve the VMP area. This section then describes the regulatory setting and evaluates the VMP's effects on GHG emissions, climate change, and energy resources. The impact evaluation begins by describing the methodology used to evaluate significance and then presents the impact analysis. Detailed information about the assumptions and modeling calculations used in this analysis are provided in **Appendix C**, *Air Quality/Greenhouse Gas Emissions Calculations,* of this DEIR.

3.7.1 Environmental Setting

Climate change results from the accumulation in the atmosphere of GHGs, which are produced primarily by the burning of fossil fuels for energy. Because GHGs (CO_2, methane, and N_2O) persist and mix in the atmosphere, emissions anywhere in the world affect the climate everywhere in the world. GHG emissions are typically reported in terms of carbon dioxide equivalents (CO_2e), which convert all GHGs to an equivalent basis taking into account their global warming potential (GWP) compared to CO_2. **Table 3.7-1** shows the six GHGs and their respective GWP.

Table 3.7-1. Greenhouse Gas Overview and Global Warming Potential

Greenhouse Gas	GWP over 100 years (in IPCC 2013/SAR)[(a)]	Description
Carbon Dioxide (CO_2)	1/1	Released into the atmosphere through burning of fossil fuels (coal, natural gas and oil), solid waste, trees, and wood products, and also because of certain chemical reactions; removed from the atmosphere when it is absorbed by plants and oceans; remains in the atmosphere for 50 to more than 100,000 years.
Methane (CH_4)	28/21	Emitted during the production and transport of coal, natural gas, and oil; methane emissions also result from livestock and other agricultural practices and from the decay of organic waste, notably in municipal solid waste landfills; remains in the atmosphere for about 10 years.
Nitrous Oxide (N_2O)	265/310	Emitted during agricultural and industrial activities, as well as during combustion of fossil fuels and solid waste; remains in the atmosphere for about 100 years.
Hydrofluoro-carbons (HFCs)	4-12,400/ 650–11,700	Typically used in refrigeration and air conditioning equipment, as well as in solvents; emissions are generated primarily from use in air conditioning systems in buildings and vehicles; remains in the atmosphere from 10 to 270 years.

Greenhouse Gas	GWP over 100 years (in IPCC 2013/SAR)[(a)]	Description
Perfluoro-carbons (PFCs)	6,630-11,100/ 6,500–9,200	Emitted as by-products of industrial and manufacturing sources; remains in the atmosphere from 800 to 50,000 years.
Sulfur Hexa-fluoride (SF_6)	23,500/23,900	Used in electrical transmission and distribution; remains in the atmosphere approximately 3,200 years.

[(a)] As scientific understanding of the global warming potential (GWP) of various greenhouse gases (GHGs) improves over time, GWP values are updated in the Intergovernmental Panel on Climate Change (IPCC) scientific assessment reports. For regulatory consistency, however, the United Nations Framework Convention on Climate Change reporting guidelines (and international treaties) for national inventories continue to the use of GWP values to those published in the IPCC's 1996 Second Assessment Report (SAR). The table shows GWP values for 100 years from IPCC 2013 and SAR.

Sources: U.S. Environmental Protection Agency [USEPA] 2018; IPCC 2013; IPCC 1996

These six gases are the major GHGs that were recognized by the United Nations Framework Convention on Climate Change in 1992 and other later international climate change treaties including the Kyoto Accords which was the first international treaty to establish GHG emission reduction goals. Other GHGs were not recognized by the international treaties, chiefly because of the smaller role that they play in global climate change or the uncertainties surrounding their effects. One GHG not recognized by the international treaties is atmospheric water (H_2O) because no obvious correlation exists between H_2O and specific human activities. Water acts in a feedback manner; higher temperatures lead to higher H_2O vapor concentrations, which in turn cause more global warming (Intergovernmental Panel on Climate Change [IPCC] 2013). Nitrogen trifluoride was not recognized in the initial Kyoto Accords, but was subsequently included by the United Nations Framework Convention on Climate Change and recognized in California as a GHG.

The most important GHG in human-induced global warming is CO_2. Although many gases have much higher GWP than the naturally occurring GHGs, CO_2 is emitted in such vastly higher quantities that it accounts for about 81 percent of the GWP of all GHGs emitted by the United States (USEPA 2020a). Fossil fuel combustion, especially for the generation of electricity and powering of motor vehicles, has led to substantial increases in CO_2 emissions over time and, thus, substantial increases in atmospheric CO_2 concentrations. In 2018, atmospheric CO_2 concentrations were about 409 ppm, more than 46 percent higher than the pre-industrial concentrations of about 280 ppm (USEPA 2020a). In addition to the sheer increase in the volume of its emissions, CO_2 is a major factor in human-induced global warming because of its long lifespan in the atmosphere (50,000–100,000 years).

In 2015, total Bay Area GHG emissions were 85 million metric tons of carbon dioxide equivalents (MMT CO_2e) which represents a decrease from the 86.6 MMT CO_2e estimated for 2011 emissions (BAAQMD 2015, BAAQMD 2017a). The transportation sector was the largest source of emissions, accounting for approximately 41 percent of the total 2015 emissions. Light and medium-duty cars and trucks accounted for 72 percent of emissions in the transportation sector while heavy duty truck accounted for 16 percent.

In 2017, Oakland's core emissions, GHGs emitted within city limits were approximately 2.6 MMT CO_2e while consumption emissions, which include lifecycle GHGs emitted due to activities occurring within city limits, were approximately 7.4 MMT CO_2e. With consumption emissions included, material use and waste was the largest source of emissions (39 percent), followed by transportation and land use (32 percent), buildings and energy use (20 percent), and port operations (9 percent). Total GHG emissions have declined by 24 percent since 2005 (City of Oakland 2020a).

Vegetation and soil in natural and working lands can serve as both carbon sources and sinks depending on management practices and events like wildfires. In California, from 1995-2016, urban forests were net carbon sinks (CARB 2020).

Energy Resources and Consumption

California has extensive energy resources, including an abundant supply of crude oil, high production of conventional hydroelectric power, and leads the nation in electricity generation from renewable resources (solar, geothermal, and biomass resources) (U.S. Energy Information Administration [EIA] 2020). California has the second highest total energy consumption in the United States but one of the lowest energy consumption rates per capita (47th in 2018) due to its mild climate and energy efficiency programs (EIA 2020). A comparison of California's energy consuming end-use sectors indicates that the transportation sector is the greatest energy consumer, by approximately two to three times compared to the other end-use sectors (Industrial, Commercial, and Residential, which are listed in order of greatest to least consumption) (EIA 2020). California is the largest consumer of motor gasoline and jet fuel in the United States (EIA 2020).

The City of Oakland uses East Bay Community Energy (EBCE) as its energy provider and utilizes EBCE's 100-percent carbon-free service for municipal accounts (City of Oakland 2019). The city placed 3rd in the 2019 Green Fleet awards and has acquired only alternative fuel or hybrid vehicles since 2002 (City of Oakland 2018a, American Council for an Energy Efficient Economy [ACEEE] 2019, 100 Best Fleets 2020). Oakland's municipal fleet is composed of greater than 9-percent-efficient vehicles, including hybrid, plug-in hybrid, and battery electric vehicles (ACEEE 2019). Between 2005 and 2013, City-wide energy use decreased 2.2 percent, with a 3.3-percent increase in electricity use being offset by a 5.4 decrease in natural gas use (City of Oakland 2020b). As of 2017, there were over 25 MW of solar capacity installed in the City (City of Oakland 2019).

Issues Linked to Climate Change

Anthropogenic (human-caused) emissions of GHGs are widely accepted in the scientific community as contributing to global warming. Temperature increases associated with climate change are expected to adversely affect plant and animal species, cause ocean acidification and sea level rise, alter frequency and intensity of precipitation events, increase wildfire risks, affect water supplies, affect agriculture, and harm public health (BAAQMD 2017a, City of Oakland 2018b, IPCC 1996, IPCC 2013). Projected local impacts of climate change include rising Bay and Delta waters, increased vulnerability to floods, decreased water supply due to shrinking Sierra snowpack, increased fire danger, more extreme heat events and public health impacts, added stress on infrastructure, higher prices for food and fuels, and other ecological and quality of life impacts (City of Oakland 2018b). Increased wildfire risk and severity are anticipated throughout

California due to the progression of climate change (Westerling 2018, Krawchuk et al. 2009). Ten of the most destructive fires in California have occurred since 2015 (CAL FIRE 2019a), and California is facing a dramatic increase in the number and severity of wildfires. The Fourth Climate Assessment (Bedsworth et al. 2018), projects that California's wildfire burn area likely will increase by 77 percent by the end of the century. As identified in Governor Newsom's Strike Force report (State of California 2019), the growing risk of catastrophic wildfires has created an imperative for the state to act urgently and swiftly to expand fire prevention efforts. The VMP anticipates an increase in wildfire potential due to climate change and seeks to manage fuels such that wildfire impacts are reduced.

Global climate change is already affecting ecosystems and societies throughout the world. Climate change adaptation refers to the efforts undertaken by societies and ecosystems to adjust to and prepare for current and future climate change, thereby reducing vulnerability to those changes. Human adaptation has occurred naturally over history; people move to more suitable living locations, adjust food sources, and more recently, change energy sources. Similarly, plant and animal species also adapt over time to changing conditions; they migrate or alter behaviors in accordance with changing climates, food sources, and predators.

Many national, as well as local and regional, governments are implementing adaptive practices to address changes in climate, as well as planning for expected future impacts from climate change. Some examples of adaptations that are already in practice or under consideration include conserving water and minimizing runoff with climate-appropriate landscaping, capturing excess rainfall to minimize flooding and maintain a constant water supply through dry spells and droughts, protecting valuable resources and infrastructure from flood damage and sea level rise, and using energy- and water-efficient appliances. By reducing the risk of wildfires and thereby also reducing the significant carbon releases associated with catastrophic wildfires, the VMP supports adaptive practices to help address climate change.

3.7.2 Regulatory Setting

This subsection discusses the federal, state, and local laws, and regulations that pertain to GHG emissions in the proposed project area and the state of California.

Federal Laws, Regulations, and Policies

USEPA is responsible for the regulation of transportation-related emission sources, such as aircraft, ships, and certain types of locomotives, under the exclusive authority of the federal government. USEPA also establishes vehicular emission standards, including those for vehicles sold in states other than California. Automobiles sold in California must meet stricter emission standards established by CARB.

In *Massachusetts v. The Environmental Protection Agency* [2007], the U.S. Supreme Court ruled that GHGs are air pollutants that can be regulated under the CAA. The court found that USEPA has a mandatory duty to enact rules regulating mobile GHG emissions under the CAA. The court held that GHGs fit the definition of an air pollutant that causes and contributes to air pollution and may reasonably be anticipated to endanger public health or welfare. Following the court's decision, in 2009, the USEPA Administrator found that the current and projected concentrations

of GHGs threaten public health and welfare of current and future generations and that combined emissions from new motor vehicles contribute to GHG pollution.

Corporate Average Fuel Economy Standards

On April 1, 2010, USEPA and the National Highway Traffic Safety Administration (NHTSA) established a program to reduce GHG emissions and improve fuel economy standards for new model year 2012–2016 cars and light trucks. On August 9, 2011, USEPA and the NHTSA announced standards to reduce GHG emissions and improve fuel efficiency for heavy-duty trucks and buses. On October 15, 2012, USEPA and NHTSA established a program to reduce GHG emissions and improve fuel economy standards for new cars and light trucks through 2025 (USEPA 2012). In August 2016, USEPA and the NHTSA jointly finalized Phase 2 Heavy-Duty National Program standards to reduce GHG emissions and improve fuel efficiency of medium- and heavy-duty vehicles for model year 2018 and beyond (USEPA 2020b). However, in August 2018, USEPA and the NHTSA proposed amendments to the standards covering model years 2021 – 2026 that would decrease the existing fuel efficiency requirements for those years and these amendments were finalized in March 2020 (NHTSA 2020).

State Laws, Regulations, and Policies

California Environmental Protection Agency (Cal EPA) is a state agency that includes CARB, the SWRCB, nine RWQCBs, California Department of Resources Recycling and Recovery (CalRecycle), California Department of Toxic Substances Control (DTSC), OEHHA, and California Department of Pesticide Regulation (CDPR). The mission of Cal EPA is to restore, protect, and enhance the environment, to ensure public health, environmental quality, and economic vitality.

GHG Reduction Goals

In recent years, California has enacted a number of policies and plans to address GHG emissions and climate change. In 2006, the California State Legislature enacted AB 32, the Global Warming Solutions Act, which set the overall goals for reducing California's GHG emissions to 1990 levels by 2020. Executive Order (EO) S-3-05 established a goal of 80 percent below 1990 levels by 2050. EO B-30-15 established an interim target to reduce California's GHG emissions to 40 percent below 1990 levels by 2030, and the 2030 target has been codified in Senate Bill (SB) 32, which was signed into law on September 8, 2016. Along with SB 32, AB 197 was also signed into law on September 8, 2016, and requires the state to focus its pollution-reduction efforts on disadvantaged communities and to increase legislative oversight of climate programs.

CARB approved the *First Update to the AB 32 Scoping Plan* on May 22, 2014 (CARB 2014). This update defines climate change priorities for the next 5 years and also sets the groundwork to reach long-term goals set forth in EOs S-3-05 and B-16-2012. The update also highlights California's progress toward meeting the near-term 2020 GHG emission reduction goals and evaluates how to align the state's longer term GHG reduction strategies with other state policy priorities for water, waste, natural resources, clean energy, transportation, and land use.

In 2017, CARB further updated the Scoping Plan to reflect progress since 2005, additional reduction measures, and plans for reductions beyond 2020. CARB approved the *2017 Climate Change Scoping Plan: The Strategy for Achieving California's 2030 Greenhouse Gas Target* (CARB 2017) on December 14, 2017, to reflect the 2030 target set by EO B-30-15 and codified by SB 32

(CARB 2017, CARB 2018). The 2017 Scoping Plan includes further emission reductions from cap and trade, clean energy, doubling building energy efficiency, clean fuels, transit-oriented development, clean cars and transit, sustainable freight, reduction of methane and refrigerants, and restoration of natural and working lands.

GHG Reduction Regulations

CARB has completed rulemaking to implement several GHG emission reduction regulations and continues to investigate the feasibility of implementing additional regulations. These include the low carbon fuel standard, which reduces GHG emissions associated with fuel usage, and the Renewable Portfolio Standard (RPS), which requires electricity suppliers to increase the amount of electricity generated from renewable sources to certain thresholds by various deadlines. SB 350 established a California GHG reduction target of 40 percent below 1990 levels and sets a renewable portfolio goal of 50 percent by 2030, along with encouraging energy efficiency savings and electrification of transportation. In 2018, SB 100 updated the RPS to require 50 percent renewable resources by the end of 2026, 60 percent by the end of 2030, and 100 percent renewable energy and zero carbon resources by 2045. EO B-55–18 signed by Gov. Brown set a goal of statewide carbon neutrality by 2045 and net negative emissions thereafter.

In January 2012, CARB approved the Advanced Clean Cars Program, a vehicle emission control program for model years 2017–2025. To advance California's support of the national program to regulate emissions, CARB submitted a proposal that would allow automobile manufacturer compliance with USEPA's requirements to show compliance with California's requirements for the same model years. The final rulemaking package was filed on December 6, 2012, and the final rulemaking became effective on December 31, 2012.

California Integrated Energy Policy

SB 1389, passed in 2002, requires the California Energy Commission (CEC) to prepare an *Integrated Energy Policy Report* (IEPR) for the governor and legislature every 2 years and an update every other year (CEC 2020a). The report analyzes data and provides policy recommendations on trends and issues concerning electricity and natural gas, transportation, energy efficiency, renewable energy, and public interest energy research (CEC 2020a). The 2017 *Final Integrated Energy Policy Report* includes policy recommendations such as implementing the Clean Energy and Pollution Reduction Act; resiliency of the electricity sector; and addressing the vulnerability of California's energy infrastructure to extreme events related to climate change, including sea-level rise and coastal flooding (CEC 2018a). The 2018 IEPR Update, *Toward A Clean Energy Future*, was split into two volumes that were adopted separately in August 2018 and February 2019 (CEC 2018b, CEC 2019). The 2018 Update covers a broad range of topics, including decarbonizing buildings, energy efficiency, energy equity, integrating renewable energy, climate adaptation activities for the energy sector, and the California Energy Demand Forecast. The Final 2019 Integrated Energy Policy Report provides analyses of electricity sector trends, building decarbonization and energy efficiency, zero-emission vehicles, energy equity, climate change adaptation, and electricity, natural gas, and transportation energy demand forecasts (CEC 2020b).

California Forest Carbon Plan

The California Forest Carbon Plan was prepared by the Forest Climate Action Team, which was comprised of members from multiple state and federal agencies. The plan contains the

following goals, objectives, and targets that may be relevant to the VMP (Forest Climate Action Team 2018):

Goal: California's overarching climate goal for forests is to manage them as healthy and resilient net sinks of carbon that provide a range of ecosystem and societal benefits while reducing GHG and other carbon emissions associated with management activities, conversion, wildfire events, and other disturbances.

Objectives and Targets:

- Enhance: Expand and improve forest management to enhance forest health and resilience, resulting in enhanced long-term carbon sequestration and storage potential.
  - Improve Health and Resilience on Private and State/Local Public Forestland
    - By 2020, double the current rate of forest restoration and fuels reduction treatments, including prescribed fire, through the CAL FIRE Vegetation Treatment Program (CalVTP; CAL FIRE 2019b) from the recent average of 17,500 acres per year to 35,000 acres per year.
    - By 2030, increase forest restoration and fuels treatments, including mechanical thinning and prescribed burning, from the current rate of approximately 17,500 acres per year to 60,000 acres per year.
  - Restore Ecosystem Health of Wildfire- and Pest-Impacted Areas through Reforestation
- Protect: Increase protection of California's forested lands and reduce conversion to non-forest uses, resulting in a more stable forested land base.
- Innovate: Pursue innovations in wood products and biomass utilization in a manner that reduces or offsets GHG emissions; promotes land stewardship; and strengthens rural economies and communities.
- Protect and Expand Urban Forests
  - Protect the existing tree canopy through policies and programs targeting ongoing maintenance and utilization of industry best management practices.
  - By 2030, increase total urban tree canopy statewide by 10 percent above current levels, targeting disadvantaged and low-income communities and low-canopy areas, with a preference for planting species and varieties that provide substantial carbon storage and are resilient to climate-linked stressors

Regional Laws, Regulations, and Policies

BAAQMD Clean Air Plan and Regional Climate Protection Strategy

The BAAQMD has adopted and released the *Final 2017 Bay Area Clean Air Plan* (also known as *Spare the Air – Cool the Climate: A Blueprint for Clean Air and Climate Protection in the Bay Area*) and *Regional Climate Protection Strategy* (RCPS) that updates the *2010 Bay Area Clean Air Plan*; provides a road map for the BAAQMD's future efforts to reduce air pollution; and

identifies rules, control measures, and strategies to reduce GHG emissions throughout the Bay Area. As part of this update, 85 control measures have been identified and categorized within nine economic sectors, including stationary sources, transportation, waste, water, and energy. Potential measures applicable to the VMP include (but are not limited to) the reduction of solid waste, reduction of water use, and use of clean available construction equipment in local projects (BAAQMD 2017a).

In addition, the BAAQMD has established a Climate Protection Planning Program, which aims to achieve its goal of reducing GHG emissions in the Bay Area by establishing GHG reduction goals, developing and implementing the 2017 Clean Air Plan, and working with local governments (BAAQMD 2020a). The BAAQMD's GHG emission reduction goals are 40 percent below 1990 levels by 2030, and 80 percent below 1990 levels by 2050 (BAAQMD 2020b).

Local Laws, Regulations, and Policies

Applicable local plans, policies, regulations, and ordinances are presented below.

Oakland 2030 Equitable Climate Action Plan

The City's 2030 Equitable Climate Action Plan (ECAP) contains the following goals and actions that may be relevant to the VMP:

Goal: GHG reduction target for the year 2030 of 56 percent below 2005 levels.

ECAP Actions:

> **A-4. Wildfire Risk Reduction.** Adopt and fully implement a Vegetation Management Plan for high-fire risk areas. Continue to update and enforce the Oakland Fire Code to require building owners in high-risk areas to maintain defensible space and implement fire prevention measures. Increase wildfire safety requirements for new construction or major renovations in high fire risk areas.
>
> **CR-2. Expand and Protect Tree Canopy Coverage.** By 2022, create a fifty-year Urban Forest Master Plan that: Prioritizes strategies to address disparities among neighborhoods in tree canopy coverage; Ensures that carbon sequestration is a major factor in tree planting targets, selection of tree species, and tree management practices; Establishes a clear and sustainable funding mechanism for ongoing tree maintenance; and Establishes a protocol and goals for community partnerships for tree planting and maintenance.
>
> **CR-3. Rehabilitate Riparian Areas and Open Space**. Secure funding to continue and expand programs to restore creeks and provide ecosystem services in coordination with stormwater management planning, prioritizing investment that reduces climate risks in frontline communities. Include funding for ongoing maintenance and public access.

City of Oakland General Plan

The following policies from the City of Oakland General Plan are relevant to the VMP (City of Oakland 1996):

Objective CO-13: Energy Resources. To manage Oakland's energy resources as efficiently as possible, reduce consumption of non-renewable resources, and develop energy resources which reduce dependence on fossil fuels.

3.7.3 Impact Analysis

Methodology

This section describes the methods used to evaluate whether the maintenance activities of the VMP would result in significant impacts related to GHG emissions, climate change, and energy.

GHG Emissions from Equipment, Vehicles, and Livestock

Emissions associated with proposed management activities were quantified; the sources of these emissions include off-road equipment such as chainsaws, tractors, mowers, chippers, masticators, and excavators; material hauling vehicles; vendor trips, and worker commutes. Emissions of GHGs were estimated based on the equipment, phasing, duration, material import and export volumes, and worker quantities. See Section 2.3.9, "Construction Personnel," for more information on worker quantities. The assumptions used to develop these estimates which are summarized in Appendix C of this DEIR.

In addition, GHG emissions from livestock and off-road equipment were estimated based on values used in a project with similar equipment and vegetation management activities, the CalVTP EIR (CAL FIRE 2019b). Emissions from worker, vendor, and hauling trips were estimated using CalEEMod Version 2016.3.2.

Carbon Sequestration Analysis

Impacts on carbon sequestration are discussed qualitatively in this analysis. VMP activities such as yarding, creation of fuel breaks, pruning, and chipping result in temporary removal of stored carbon, accelerated release of carbon via decay, and by removing growing vegetation may initially decrease sequestration rates. Other activities such as mulching, grazing, thinning, and revegetation may gradually increase carbon stored in soil and vegetation.

While VMP areas have been prioritized and treatment methods selected, the VMP includes an adaptive management component and it is not known which specific plants will receive which type or types of treatment and when, therefore the loss of carbon stock cannot be accurately quantified. Modeling carbon content requires detailed information on the health, size, and type of vegetation removed at the time of removal, which, given the 10-year plan timeframe, would be speculative at this point. Calculation of any increases in carbon sequestration rates over time due to reduced fire risk, improved plant health, and increased soil organic carbon content would be similarly speculative at this time. Therefore, a qualitative discussion of the carbon sequestration impacts of the plan are provided as well as an analysis of the plan's consistency with BAAQMD's Clean Air Plan, the California Forest Carbon Plan, and the State's Updated Scoping Plan.

Criteria for Determining Significance

Based on Appendix G of the CEQA Guidelines and the City of Oakland CEQA Thresholds of Significance, the VMP would result in a significant impact on GHG emissions and energy resources if it would:

- Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment, specifically;
  - Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of GHGs;
  - Result in potentially significant environmental impacts due to wasteful, inefficient, or unnecessary consumption of energy resources during project construction or operation; or
  - Conflict with or obstruct a state or local plan for renewable energy or energy efficiency.

In addition, the VMP would result in a significant impact on carbon sequestration if it would:

- Result in the loss of forest land or conversion of forest land to non-forest use, such that it would release significant amounts of GHG emissions, or significantly reduce carbon sequestering.

The BAAQMD CEQA Guidelines included operation-related thresholds of significance for land use development and stationary-source projects. Stationary sources have a threshold of 10,000 MT CO_2e. For land use development projects, including residential, commercial, industrial, and public land uses and facilities, the threshold includes compliance with a qualified GHG reduction strategy or annual emissions of less than 1,100 MT CO_2e or efficiency performance criteria based on service population (BAAQMD 2017b). This "bright-line threshold" of 1,100 MT CO_2e was set for the 2020 goal established in AB 32. At the time of publication of this EIR, BAAQMD has not provided an updated analysis regarding the applicability of this bright-line threshold to the 2030 and 2050 goals of SB 32. Because implementation of the VMP would take place after 2020, the GHG analysis should consider whether the project would make substantial progress toward these future goals. In absence of guidance from BAAQMD, the relevance of an appropriate threshold for post-2020 GHG emissions must be considered. For purposes of this EIR, this analysis presents several threshold options and evaluates the VMP against each option to support the final impact conclusion.

Bright-Line Threshold

One option to consider is to continue the use of the 1,100 MT CO_2e threshold. This threshold was established by BAAQMD by conducting a "gap" analysis, considering the emissions reductions required from projects undergoing CEQA review that are not otherwise addressed by existing regulations or strategies identified in the Scoping Plan. BAAQMD determined that, with a bright-line threshold of 1,100 MT CO_2e, most CEQA projects would be required to implement all feasible mitigation measures because they would exceed this threshold and, most importantly, that 92 percent of GHG emissions above this threshold would be captured (Appendix D of BAAQMD 2017b).

Sacramento Metropolitan Air Quality Management District (SMAQMD) initially conducted a similar analysis of the CEQA projects that would be captured by establishing a bright-line threshold for the 2020 goals. Recently, SMAQMD updated its analysis and determined that the existing bright-line threshold would still capture over 98 percent of GHG emissions (SMAQMD 2020). Thus, it would be reasonable to assume that an updated analysis by BAAQMD would find that projects would continue to achieve a high capture rate of total GHG emissions with use of this bright-line threshold. This conclusion supports the continued use of 1,100 MT CO_2e as a significance threshold post-2020 and indicates that continued progress toward the 2030 and 2050 goals is likely to be maintained with this bright-line threshold.

Revised Bright-Line Threshold

A second option to consider is applying the CARB's 40 percent reduction target for 2030 compared to 2020 levels. Applying this to BAAQMD's bright-line threshold would produce a revised bright-line threshold of 660 MT CO_2e. The City of Oakland's 56 percent reduction goal in 2030 from 2005 is not relevant as it was based on an emission inventory analysis that does not include the primary emission source categories included in the VMP emission inventory, such as animal grazing, off-road construction equipment, and landscaping equipment (Appendix B of City of Oakland 2020a). Even if a 56 percent reduction was applied to the 1,100 MT CO_2e threshold, this would produce a revised bright-line threshold of 484 MT CO_2e. Either of these options would be overly conservative, as existing regulations will reduce the statewide and Oakland area emissions substantially. In addition, the 2017 Scoping Plan estimates that only a 4- to 8-percent reduction will be required from natural and managed lands (the emission category most applicable to analysis of the VMP); the 2017 Scoping Plan indicates that this reduction is to be achieved by increased management to improve resiliency (reduce wildland fires) and more reliable long-term carbon storage. These approaches are the purpose of the VMP.

Zero Equivalency Threshold

A third option is to consider a zero equivalency option, which establishes a level below which project-specific increases in GHG emissions are considered equivalent to zero. This concept is currently used for air-permitted sources by the San Joaquin Valley Air Pollution Control District (SJVAPCD), which has established that its zero equivalency level is 230 MT CO_2e per year (SJVAPCD 2012). While this policy is primarily applicable to small stationary sources, it puts into context what can be classified as a *de minimis* increase in GHG emissions.

Other Threshold Options

Other threshold options considered and dismissed for evaluation of the VMP in this EIR are use of an efficiency metric or comparison to a "business as usual" (BAU) or reference percent reduction. An efficiency metric, such as BAAQMD's 4.2 MT CO_2e per service population, GHG per acre managed, or GHG per animal grazed, is not a feasible option because it would be difficult to establish the correct service population or alternative metric to apply to natural and managed lands, such as comparing emissions to a typical residential/commercial land use project, where this type of threshold is more commonly used. A BAU approach would be difficult to apply because capturing the primary vegetation management source categories would require quantification of changes in resiliency and reliability of long-term carbon storage. At this time, quantitative methods to measure these changes are still being established, as outlined in

the 2017 Scoping Plan. Without a reliable method for quantifying this change, which is the primary reduction target for this source category, a BAU analysis would not be meaningful.

Threshold Used in This Analysis

Based on these three potential options of bright-line thresholds, ranging from 230 MT CO_2e per year to 1,100 MT CO_2e per year, emissions less than any of these possible values would be less than significant because the project would be making substantial progress toward the 2030 and 2050 GHG emission goals.

Environmental Impacts

Impact GHG-1: Generate GHG Emissions (*Less than Significant*)

VMP activities would generate GHG emissions through the combustion of fossil fuels during the operation of gasoline- and diesel-powered equipment and off-road vehicles. Worker, vendor, and hauling trips would also generate GHG emissions. Additionally, livestock would emit methane during grazing activities. Impacts on carbon sequestration are discussed in Impact GHG-4 below. **Table 3.7-2** shows annual GHG emissions from current and recent vegetation management activities (as detailed under Section 2.2.1, "Background") were estimated to be approximately 158 MT CO_2e, while the VMP's estimated annual GHG emissions would be approximately 217 MT CO_2e. Appendix C of this DEIR contains detailed assumptions used to estimate current and VMP-related annual GHG emissions. The increase in emissions from baseline would result primarily from the increase in grazing and increased use of construction and landscaping equipment to conduct mechanical treatments. Thus, the VMP would generate an increase of approximately 59 MT CO_2e from baseline conditions, which is less than any of the three bright-line threshold options (ranging from 230 MT CO_2e per year to 1,100 MT CO_2e per year). These emissions would likely decrease over time as vehicles and equipment, in compliance with federal and state regulations and City goals, increase in efficiency and transition to low or no emission models. Additionally, VMP activities would decrease the risk of large uncontrolled and unplanned emissions from wildfires; this reduction has not been accounted for in these baseline calculations.

Table 3.7-2. VMP GHG Emissions

VMP Activity		CO_2e Emissions – Annual (Metric Tons / Year)
Baseline		
Grazing	Grazing	101.72
	Worker Trips	8.11
Roadside Treatments	Roadside Treatments (Assume all Hand Labor)	35.20
	Worker Trips	12.52
	Baseline Total	157.55

VMP Activity		CO_2e Emissions – Annual (Metric Tons / Year)
VMP		
Grazing	Grazing	123.30
	Grazing – Trips	8.98
Hand Labor	Hand Labor	59.00
	Hand Labor – Trips	18.90
Mechanical	Mechanical	6.20
	Mechanical – Trips	5.60E-01
Herbicide	Herbicide	0.00
	Herbicide – Trips	0.12
Summary		
Annual	**Emissions – Annual (metric tons/year)**	
	VMP Total	217.06
	VMP Total – Baseline	59.51
	BAAQMD Threshold	1,100
Above Threshold?		No

Conclusion

VMP activities would result in the emission of GHGs through the combustion of fossil fuels by equipment and vehicles, and in the form of methane emissions from livestock. VMP GHG emissions would be well below the three potential bright-line thresholds. Additionally, the purpose of the VMP is to reduce the risk of uncontrolled wildfires which can emit large amounts of GHGs. Therefore, the VMP's impacts regarding generation of GHG emissions would be **less than significant** and no mitigation is required**.**

Impact GHG-2: Potential to Conflict with an Applicable Plan, Policy, or Regulation Adopted for the Purpose of Reducing the Emissions of GHGs (*Less than Significant*)

The City of Oakland has established a goal of reducing GHG emissions by 56 percent by 2030 compared to a 2005 baseline. The VMP would use fossil-fuel powered vehicles and off-road construction and landscaping equipment and would not involve the construction of any facilities that would generate GHG emissions. The VMP would also generate GHG emissions in the form of methane from grazing. The emission source categories included in the City's emission inventory, which was used to determine that a 56 percent reduction by 2030 would be needed to meet climate goals, did not include the primary emission source categories relevant to the VMP, such as animal grazing, off-road construction equipment, and landscaping equipment (Appendix B of City of Oakland 2020a).

Even though GHG emissions associated with the VMP are not explicitly included in the City's GHG emission inventory, the adoption and implementation of a VMP is one of the actions included in the Oakland 2030 Equitable Climate Action Plan. The VMP would not conflict with any of the goals, policies, or implementation actions identified in the applicable GHG reduction plans, such as the *Oakland 2030 Equitable Climate Action Plan* (City of Oakland 2020a), because it would not create any facilities that would generate future GHG emissions, and would be completed as efficiently as possible. Vegetation management and urban forestry are also recognized in the 2017 Scoping Plan (CARB 2017) as being needed to enhance carbon sequestration and resilience through management and restoration. Therefore, the activities proposed in the VMP are in line with the 2017 Scoping Plan goals for natural and working lands. Also, many of the activities that would be conducted under the VMP are currently performed under existing conditions. Additionally, VMP activities would decrease the risk of large uncontrolled and unplanned emissions from wildfires, which is key to improving resilience of natural and working lands. Thus, the VMP's emissions would not involve any activities that would conflict with the City's plans and reduction goals or the statewide reduction goals related to AB 32, SB 32, and EO B-55-18, and would not represent a significant source of the City's GHG emissions.

Conclusion

For the reasons described above, this impact would be **less than significant** and no mitigation is required**.**

Impact GHG-3: Result in Wasteful, Inefficient, or Unnecessary Consumption of Energy Resources or Conflict with a State or Local Plan for Renewable Energy or Energy Efficiency (*Less than Significant with Mitigation*)

The VMP's activities would require the consumption of energy (fossil fuels, electricity) for equipment, worker vehicles, vendor and hauling trips, and powering the electric fence used during grazing. The consumption of energy for the VMP's equipment and vehicles would be reduced by implementing **Mitigation Measure AQ-1 (Fugitive Dust BMPs),**which would minimize vehicle idling and ensure that equipment is properly tuned and maintained.

The energy consumption during VMP activities is necessary for fire hazard reduction and resource protection; and a portion of VMP activities are already conducted under current/baseline conditions. Additionally, wildfires can damage powerlines and other energy infrastructure and responses to wildfires can expend large amount of energy with protection of public safety prioritized over efficiency. VMP activities would not cause wasteful, inefficient, and unnecessary consumption of energy or cause a substantial increase in energy demand and the need for additional energy resources.

In addition, VMP activities would not conflict with any of the goals, policies, or implementation actions identified in the applicable energy plans, such as the *Final 2019 Integrated Energy Policy Report, City of Oakland General Plan,* and *City of Oakland Energy and Climate Action Plan* because the VMP activities would not create any future energy demands and would be completed as efficiently as possible. Thus, with implementation of Mitigation Measure AQ-1, the VMP would not conflict with any plans relating to renewable energy or energy efficiency.

Mitigation Measures

Mitigation Measure AQ-1: Fugitive Dust BMPs

See text in Section 3.3, "Air Quality."

Conclusion

The VMP's effect on energy resources would be **less than significant with mitigation**.

Impact GHG-4: Reduction in Carbon Sequestration (*Less than Significant*)

The 2018 Forest Carbon Plan includes multiple goals relating to sustaining forests and it supports the treatment of forests to reduce wildfire risks, primarily through thinning and forest treatments that improve forest health.

VMP activities involving the removal of trees, shrubs, and grasses would lead to a temporary drop in carbon in live vegetation and could marginally decrease carbon sequestration rates in the short term. However, these activities would support forest health and reduce the risk of catastrophic wildfire, which can result in the uncontrolled and rapid release of significant amounts of stored carbon and the dramatic reduction in future sequestration by destroying vegetation over large areas. In the 2017 Scoping Plan, California identified that 80 percent of carbon sequestration loss from natural and working lands was a result of loss from wildland fire.

Most forest carbon removed would be left as cut, chipped, or mulched material on the ground surface. This material would decompose into soil carbon, with some off-gassing from the decomposition process. Some material would be hauled off-site to mulch/compost facilities. Additionally, VMP treatments in forested areas focus on removing smaller trees such as saplings and sprouts, while retaining larger diameter trees which are both more fire-resistant and store larger amounts of carbon compared to smaller diameter trees. This approach would minimize the amount of forest carbon lost due to VMP treatments.

Conclusion

VMP activities would lead to a temporary drop in carbon in live vegetation and could marginally decrease carbon sequestration rates in the short term. However, the purpose of these activities is to reduce the risk of wildfires, which can result in the uncontrolled and rapid release of large amounts of stored carbon and a dramatic reduction in carbon sequestration rates over impacted areas over the longer term. Additionally, these activities are in alignment with the State's Forest Carbon Plan. Therefore, this impact would be **less than significant** and no mitigation is required.

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3.8 HAZARDS AND HAZARDOUS MATERIALS

This section describes the existing conditions of the VMP area and regulatory setting with respect to hazards and hazardous materials. The environmental setting section identifies areas potentially affected by known hazardous materials in soil or groundwater. This section also describes the significance criteria and methodology used to evaluate the potential impacts of the VMP related to hazardous materials. Potential wildfire impacts associated with the VMP are described in Section 3.14, "Wildfire."

3.8.1 Environmental Setting

Schools

Multiple schools are located within the VMP area. Public schools within 0.25 mile of VMP treatment projects are shown in **Table 3.8-1**.

Hazardous Materials in Soil and Groundwater

Hazardous materials contamination of soil and groundwater typically occurs from improper hazardous materials containment or management at sites with current or past land uses involving hazardous materials use (e.g., gas stations, dry cleaning facilities, military land uses, waste disposal sites). Known hazardous materials sites are documented in the SWRCB's GeoTracker database and California Department of Toxic Substance Control's (DTSC's) EnviroStor database. **Table 3.8-2** shows such known sites within 0.25 mile of VMP treatment projects, as identified in GeoTracker and/or EnviroStor. In addition to known hazardous materials sites, unknown contamination of soil or groundwater with hazardous materials is possible.

Airports

No airports are located within 2 miles of the VMP area. The nearest airport is Oakland International Airport, which is approximately 3.3 miles from the closest portion of the VMP area.

Table 3.8-1. Public Schools within 0.25 Mile of VMP Treatment Projects

School			Distance to VMP Areas (feet)
Name	**Address**	**Grades**	
East Bay Innovation Academy	3400 Malcolm Avenue	6-12	82.6
Castlemont High	8601 MacArthur Boulevard	8-12	291.8
LPS Oakland R & D Campus	8601 MacArthur Boulevard	9-10	313.6
Castlemont Primary Academy	8711 MacArthur Boulevard	K-5	300.9
Castlemont Junior Academy	8711 MacArthur Boulevard	6-8	308.0
Hillcrest Elementary	30 Marguerite Drive	K-8	0.0
Bay Area Technology	8251 Fontaine Street	6-12	278.1
Rudsdale Continuation	8251 Fontaine Street	10-12	246.0
Independent Study, Sojourner Truth	8251 Fontaine Street	1-12	258.6
Montclair Elementary	1757 Mountain Boulevard	K-5	131.3
Glenview Elementary	4215 La Cresta Avenue	K-5	964.3
Parker Elementary	7929 Ney Avenue	K-5	1,046.0
Grass Valley Elementary	4720 Dunkirk Avenue	K-5	554.9
Chabot Elementary	6686 Chabot Road	K-5	701.3
Conservatory of Vocal/Instrumental Arts	3800 Mountain Boulevard	K-9	811.2
Community School for Creative Education	8755 Fontaine Street	K-4	258.2
Howard Elementary	8755 Fontaine Street	K-5	244.3
Kaiser Elementary	25 South Hill Court	K-5	544.8
Community Day	4917 Mountain Boulevard	9-12	0.0
Oakland Community Day Middle	4917 Mountain Boulevard	7-8	0.0
Francophone Charter School of Oakland	9736 Lawlor Street	K-8	118.5
Carl B. Munck Elementary	11900 Campus Drive	K-5	219.1
Joaquin Miller Elementary	5525 Ascot Drive	K-5	506.4
Montera Middle	5555 Ascot Drive	6-8	516.6
Burckhalter Elementary	3994 Burckhalter Avenue	K-5	329.5
Redwood Heights Elementary	4401 39th Avenue	K-5	150.6

Table 3.8-2. Known Hazardous Materials Sites within 0.25 Mile of VMP Treatment Projects

Hazardous Materials Site					Distance to VMP Areas (feet)
Site Name	**Address**	**EnviroStor / GeoTracker ID**	**Site Type**	**Status**	
Oakland Unity High School	2955 Peralta Oaks Court	60001662	School Investigation	No Action Required	183.8
Oakland Naval Hospital	8750 Mountain Boulevard	1970003	State Response	No Further Action	705.6
Oakland Naval Hospital	8750 Mountain Boulevard	80001204	Voluntary Cleanup	Active	705.6
Durant Park Man Area	4720 Dunkirk Avenue	80000389	Military Evaluation	No Further Action	222.6
6200 Antioch Street	6200 Antioch Street	60002624	Voluntary Cleanup	Active	393.9
Bennett's Auto Repair	735 MacArthur Boulevard	T0600101825	LUST Cleanup Site	Completed – Case Closed	548.5
Former Dynasty Cleaners	293-295 MacArthur Boulevard	T10000006397	Cleanup Program Site	Open – Assessment & Interim Redial Action	1250.8
Sabek Inc.	635 MacArthur Boulevard	T0600100729	LUST Cleanup Site	Completed – Case Closed	641.7
Earle Shenk Residence	6159 Acacia Avenue	T0600101570	LUST Cleanup Site	Completed – Case Closed	796.8
Gallagher & Burke	7100 Mountain Boulevard	T0600101135	LUST Cleanup Site	Completed – Case Closed	301.3
Arco	2740 98th Avenue	T0600100088	LUST Cleanup Site	Completed – Case Closed	465.7
Oak Knoll Naval Hospital	8750 Mountain Boulevard	T0600100954	LUST Cleanup Site	Completed – Case Closed	715.6
Oakland Naval Hospital	8750 Mountain Boulevard	T0600112722	Military Cleanup Site	Completed – Case Closed	954.7
Chevron	11880 Skyline Boulevard	T0600101291	LUST Cleanup Site	Completed – Case Closed	113.2
City of Oakland Corporation Yard	5921 Shepherd Canyon Road	T0600100469	LUST Cleanup Site	Completed – Case Closed	0.0
City of Oakland Fire Station #24	6226 Moraga Avenue	T0600101588	LUST Cleanup Site	Completed – Case Closed	0.0
Classic Touch Cleaners	3518 Fruitvale Avenue	T10000003562	Cleanup Program Site	Completed – Case Closed	971.8
Former Norge Cleaners	2114 MacArthur Boulevard	T10000001544	Cleanup Program Site	Open – Verification Monitoring	1008.7
Glenview Elementary School	4215 La Cresta Avenue	T10000011445	LUST Cleanup Site	Open – Site Assessment	657.5
1431 Leimert Boulevard	1431 Leimert Boulevard	T10000011595	Cleanup Program Site	Open – Site Assessment	178.5
Unocal #5269	2240 Mountain Boulevard	T0600101457	LUST Cleanup Site	Completed – Case Closed	632.6

Hazardous Materials Site					Distance to VMP Areas (feet)
Site Name	**Address**	**EnviroStor / GeoTracker ID**	**Site Type**	**Status**	
City of Oakland Fire Station #25	2795 Butters Drive	T0600100579	LUST Cleanup Site	Completed – Case Closed	0.0
Hi Hat Cleaners	11881 Skyline Boulevard	T06019799056	Cleanup Program Site	Completed – Case Closed	197.1
Private Residence	6106 Oceanview Drive	T10000005350	LUST Cleanup Site	Completed – Case Closed	758.7
City of Oakland Fire Station #6	7080 Colton Boulevard	T0600100585	LUST Cleanup Site	Completed – Case Closed	22.6
Car Service	5865 Broadway	T0600191449	LUST Cleanup Site	Completed – Case Closed	781.0
Chevron #9-3575	5775 Broadway	T0600101668	LUST Cleanup Site	Completed – Case Closed	1081.6
Private Residence	Private Residence	T10000001165	LUST Cleanup Site	Completed – Case Closed	584.7
Golden Gate Academy	3800 Mountain Boulevard	T0600101634	LUST Cleanup Site	Completed – Case Closed	509.7
Sequoyah Country Club	4550 Heafey Road	T0600101215	LUST Cleanup Site	Completed – Case Closed	638.7
Exxon #7-8907	8008 Mountain Boulevard	T0600100554	LUST Cleanup Site	Completed – Case Closed	1289.0
Lake Chabot Golf Course	11450 Golf Links Road	T0600101699	LUST Cleanup Site	Completed – Case Closed	0.0
Merritt College	12500 Campus Drive	T0600101633	LUST Cleanup Site	Completed – Case Closed	88.9
Young's Cleaners	10700 MacArthur Boulevard	SL18344764	Cleanup Program Site	Open – Assessment & Interim Remedial Action	999.2
EBMUD San Leandro Filter Plant	7700 Greenley Drive	T0600102049	LUST Cleanup Site	Completed – Case Closed	1238.0
Leona Heights Sulfur Mine	End of McDonell Avenue	L10003827506	Cleanup Program Site	Open – Verification Monitoring – Land Use Restrictions	934.0
Chevron #9-2142 (Independent)	4150 Redwood Road	T0600102249	LUST Cleanup Site	Open – Assessment & Interim Remedial Action	143.0
Chevron #9-3415	4500 Park Boulevard	T0600102247	LUST Cleanup Site	Completed – Case Closed	705.1
USA Petroleum	10700 MacArthur Boulevard	T0600101808	LUST Cleanup Site	Completed – Case Closed	516.8
Chevron #9-1740	6550 Moraga Avenue	T0600100353	LUST Cleanup Site	Completed – Case Closed	559.8
Mills College	5000 MacArthur Boulevard	T0600100899	LUST Cleanup Site	Completed – Case Closed	635.5
Shell #13-5683	9750 Golf Links Road	T0600101931	LUST Cleanup Site	Completed – Case Closed	148.3
BP #11122	3101 98th Avenue	T0600100203	LUST Cleanup Site	Completed – Case Closed	688.0

Hazardous Materials Site					Distance to VMP Areas (feet)
Site Name	**Address**	**EnviroStor / GeoTracker ID**	**Site Type**	**Status**	
Shell #13-5683	9750 Golf Links Road	T0600140495	LUST Cleanup Site	Completed – Case Closed	49.0
Southland #19403	10501 Foothill Boulevard	T0600100002	LUST Cleanup Site	Completed – Case Closed	556.2
Emergency Operations Center	3304 Joaquin Miller Road	T0600101586	LUST Cleanup Site	Completed – Case Closed	18.0
Payless Gas	999 MacArthur Boulevard	T0600198797	Cleanup Program Site	Completed – Case Closed	1054.0
10605 Foothill Boulevard	10605 Foothill Boulevard	T10000012379	Cleanup Program Site	Open – Verification Monitoring	492.9
Exxon #7-4121	10605 Foothill Boulevard	T0600120383	LUST Cleanup Site	Completed – Case Closed	507.7
Arco #6002	6235 Seminary Avenue	T0600100105	LUST Cleanup Site	Completed – Case Closed	11.4
Caltrans Caldecott Tunnel	240 Caldecott Lane	T10000003438	LUST Cleanup Site	Completed – Case Closed	543.5
Desert Petroleum #796	2844 Mountain Boulevard	T0600100090	LUST Cleanup Site	Open – Site Assessment	982.9
Mashhoon Property / Union 76	5725 Thornhill Drive	T0600102278	LUST Cleanup Site	Completed – Case Closed	779.8

Notes: LUST = leaking underground storage tank

Source: DTSC 2020; SWRCB 2020

Emergency Response and Evacuation

As described in Chapter 2, *Project* Description*,* one of the primary goals of the VMP is to reduce wildfire hazard along critical access/egress routes within the City's very high fire hazard severity zone (VHFHSZ). As such, many of the roadways identified for treatment in the VMP are considered critical routes for emergency response and evacuation. Many of these roadways are also designated evacuation routes in the City of Oakland General Plan, Safety Element (City of Oakland 2004), including:

- Skyline Boulevard
- Golf Links Road
- Keller Avenue
- Redwood Road
- Joaquin Miller Road
- Park Boulevard
- Grizzly Peak Boulevard
- Claremont Avenue

3.8.2 Regulatory Setting

Federal Laws, Regulations, and Policies

Comprehensive Environmental Response, Compensation, and Liability Act

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA, also called the Superfund Act) (42 U.S. Code [USC] Section 9601 *et seq.*) is intended to protect the public and the environment from the effects of past hazardous waste disposal activities and new hazardous material spills. Under CERCLA, the USEPA has the authority to identify the parties responsible for hazardous materials releases and to ensure their cooperation in site remediation. CERCLA also provides federal funding (through the "Superfund") for the remediation of hazardous materials contamination. The Superfund Amendments and Reauthorization Act of 1986 (Public Law 99-499) amends some provisions of CERCLA and provides for a Community Right-to-Know program.

Resource Conservation and Recovery Act

The Resource Conservation and Recovery Act (RCRA) (42 USC Section 6901 *et seq.*) was enacted in 1976 as an amendment to the Solid Waste Disposal Act to address the nationwide generation of municipal and industrial solid waste. RCRA gives USEPA the authority to control the generation, transport, treatment, storage, and disposal of hazardous waste, including underground storage tanks storing hazardous substances. RCRA also establishes a framework for the management of nonhazardous wastes. RCRA addresses only active and future facilities; it does not address abandoned or historical sites, which are covered by CERCLA (as described above).

Federal Insecticide, Fungicide, and Rodenticide Act

The Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) (7 USC Section 136 *et seq.*) was enacted in 1947. The purpose of FIFRA is to establish federal jurisdiction over the distribution,

sale, and use of pesticides. Key provisions of FIFRA require pesticide applicators to pass a licensing examination for status as "qualified applicators," create a review and registration process for new pesticide products, and provide for thorough and understandable labeling that includes instructions for safe use.

Occupational Safety and Health Administration Regulations

The Occupational Safety and Health Act of 1970 created the Occupational Safety and Health Administration (OSHA) to ensure safe and healthful conditions for workers by setting and enforcing standards and by providing training, outreach, education, and assistance. To fulfill this purpose, OSHA develops and enforces mandatory job safety and health standards. These standards, codified in 29 Code of Federal Regulations (CFR) Part 1910, address issues that range in scope from walking and working surfaces, to exit routes and emergency planning, to hazardous materials and personal protective equipment (PPE). They include exposure limits for a wide range of specific hazardous materials, including pesticides, as well as requirements that employers provide PPE (i.e., protective equipment for eyes, face, or extremities; protective clothing, and respiratory devices) to their employees wherever such equipment is necessary (29 CFR Section 1910.132).

State Laws, Regulations, and Policies

California state regulations, which are equal to or more stringent than federal regulations, require those handling hazardous wastes to plan for and manage such wastes to handle, store, and dispose of them properly, to reduce risks to human health and the environment.

Hazardous Substance Account Act

The Hazardous Substance Account Act (HSAA), codified in Health and Safety Code Sections 25300-25395.45, is the California equivalent of CERCLA. The HSAA established a program to: (a) provide for response authority for releases of hazardous substances, including spills and hazardous waste disposal sites that pose a threat to the public health or the environment; (b) compensate persons, under certain circumstances, for out-of-pocket medical expenses and lost wages or business income resulting from injuries proximately caused by exposure to releases of hazardous substances, and (c) make available adequate funds in order to permit the State of California to assure payment of its 10-percent share of the costs mandated pursuant to CERCLA.

Hazardous Waste Control Act

The Hazardous Waste Control Act of 1972 created the Hazardous Waste Management Program, which is similar to, but more stringent than, the federal program under RCRA. The Hazardous Waste Control Act is implemented by regulations contained in Title 26 of the California Code of Regulations (Cal. Code Regs.). These regulations list more than 800 materials that may be hazardous and establish criteria for their identification, packaging, and disposal. Under the Hazardous Waste Control Act and Title 26 Cal. Code Regs., hazardous waste generators must complete a manifest that accompanies the waste from the generator to the transporter to the ultimate disposal location. Copies of the manifest must also be filed with DTSC.

Pesticide Regulations

USEPA has delegated primary authority to the California Department of Pesticide Regulation (CDPR) to enforce federal and state laws pertaining to the proper and safe use of pesticides. County Agricultural Commissioners (CACs) and their staffs are largely responsible for in-field enforcement of CDPR's pesticide use regulations in California's 58 counties. Personnel from CDPR's headquarters and CDPR field staff provide training, coordination, and technical and legal support to the counties.

Title 3 Cal. Code Regs., Division 6 describes the role of CDPR and provides guidance related to pesticide regulatory programs; pesticides (including pesticide registration and the identification and use of restricted materials); licensing, work requirements, and pesticide-related worker safety during pest control operations; and environmental protection for groundwater, air quality, aquatic and marine environments, surface water, and compost. The CACs, on behalf of CDPR, are responsible for enforcement of these human health and environmental protections in the field.

Healthy School Act of 2000 (California Education Code, Sections 17608–17613)

The Healthy School Act of 2000 restricts the use of certain pesticides at school sites and requires noticing for application of approved pesticides at schools. Under Section 17610 of the California Education Code, the use of a pesticide on a school site is prohibited if that pesticide is granted a conditional registration, an interim registration, or an experimental use permit by CDPR, or if the pesticide is subject to an experimental registration issued by USEPA, and (a) the pesticide contains a new active ingredient or (b) the pesticide is for new use. The use of a pesticide on a school site is prohibited if CDPR cancels or suspends registration, or requires phase-out of use, of that pesticide.

Under Section 17611 of the California Education Code, each school site must keep records of all pesticide use at the school site for a period of 4 years, and make such information available to the public. Under Section 17612, the school designee must annually provide to all staff and parents/guardians of pupils written notification of the names of all pesticide products (as well as product active ingredients) that are expected to be applied at the school site in the upcoming year. The school designee must post a warning sign in each area of the school site where pesticides are to be applied, displaying the pesticide product's name, manufacturer's name, USEPA's product registration number, intended date and areas of application, and reason for the pesticide applications.

Emergency Services Act

Under the Emergency Services Act, the State of California developed a plan to coordinate emergency services provided by federal, state, and local agencies. Rapid response to incidents involving hazardous materials or hazardous waste is an important part of the plan, which is administered by the California Office of Emergency Services. This office coordinates the responses of other agencies, including USEPA, the California Highway Patrol, the nine RWQCBs, the various air quality management districts, and County disaster response offices.

California Occupational Safety and Health Administration Standards

Title 8 of the California Occupational Safety and Health Administration (Cal/OSHA) regulations specifies that workers who may be exposed to contaminated soils, vapors that could be inhaled, or groundwater containing hazardous levels of constituents are subject to monitoring and personal safety equipment requirements that specifically address airborne contaminants. The primary intent of the Title 8 requirements is to protect worker health.

Local Laws, Regulations, and Policies

City of Oakland General Plan

Goals and policies from the City of Oakland General Plan (City of Oakland 2004) that are relevant to the VMP include the following:

> **Policy FI-3:** Prioritize the reduction of the wildfire hazard, with an emphasis on prevention.
>
> **Policy PS-1:** Maintain and enhance the city's capacity to prepare for, mitigate, respond to and recover from disasters and emergencies.
>
> **Policy HM-1:** Minimize the potential risks to human and environmental health and safety associated with the past and present use, handling, storage and disposal of hazardous materials.
>
> **Policy HM-2:** Reduce the public's exposure to toxic air contaminants through appropriate land use and transportation strategies.

North Oakland Hill Area Specific Plan

The North Oakland Hill Area Specific Plan (City of Oakland 1986) is a document addressing land use, infrastructure, zoning, and development in a portion of the Oakland hills. The area covered by this specific plan is generally located along the ridgeline northwest of Shepherd Canyon Road. This specific plan includes a vegetation management prescription and specific policies and mitigation measures to reduce fire hazard risk within the North Oakland hill area. The approach and goals addressed by these policies and mitigation measures have, in many cases, been incorporated into the City's General Plan and elements of the Draft VMP.

Unified Program: Alameda County Department of Environmental Health

Many of the federal and state laws and regulations described above are implemented on the local level by Certified Unified Program Agencies (CUPAs). The Alameda County Department of Environmental Health (ACDEH) is the CUPA for Alameda County, including the City of Oakland, and implements numerous hazardous materials management and environmental protection programs, including:

- Hazardous Materials Business Plan
- Hazardous Waste Generator
- Underground Storage Tank
- Aboveground Petroleum Storage Act
- California Accidental Release Prevention

City of Oakland's Integrated Pest Management Resolution

The City of Oakland's Pest Management Resolution (No. 73968 C.M.S., 1997) identifies that pesticides shall not be used in or on City-owned properties or facilities, with specific exemptions. Exemptions include where use is required to preserve and/or protect human health and safety, around fire hydrants, and on public streets and rights-of-way maintained by the City, amongst others. Certain pesticides (e.g., pesticidal soaps, botanicals, horticultural oils) are also exempted.

Airport Land Use Compatibility Plans

No airport land use compatibility plans are applicable to the VMP. As noted above, the VMP area is more than 3 miles from the nearest airport (Oakland International Airport).

3.8.3 Impact Analysis

Methodology

This analysis used a qualitative approach to assess the potential for VMP activities to result in adverse impacts related to hazards and hazardous materials. The assessment and significance determinations were guided by the significance criteria provided below. The analysis assumed adherence to existing laws and regulations during applicable VMP activities. Where appropriate and feasible, mitigation measures were identified to reduce potentially significant impacts.

Criteria for Determining Significance

Based on the City of Oakland's CEQA Thresholds of Significance Guidelines (2013) and any subsequent relevant updates to Appendix G of the CEQA Guidelines (on which the City's Guidelines are based), the VMP would result in a significant impact on hazards or hazardous materials if it would:

- Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials;
- Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment;
- Create a significant hazard to the public through the storage or use of acutely hazardous materials near sensitive receptors [NOTE: Per the BAAQMD CEQA Guidelines, evaluate whether the project would result in persons being within the Emergency Response Planning Guidelines (ERPG) exposure level 2 for acutely hazardous air emissions either by siting a new source or a new sensitive receptor. For this threshold, sensitive receptors include residential uses, schools, parks, daycare centers, nursing homes, and medical centers];
- Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within 0.25 mile of an existing or proposed school;

- Be located on a site that is included on a list of hazardous materials sites compiled pursuant to California Government Code Section 65962.5, and as a result, create a significant hazard to the public or the environment;

- Result in less than two emergency access routes for streets exceeding 600 feet in length unless otherwise determined to be acceptable by the Fire Chief, or his/her designee, in specific instances due to climatic, geographic, topographic, or other conditions;

- For a project located within an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, result in a safety hazard or excessive noise for people residing or working in the project area;

- Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan; or

- Expose people or structures, either directly or indirectly, to a significant risk of loss, injury, or death involving wildland fires.

Issues Not Evaluated Further

The following criteria are dismissed from the impact analysis for the reasons described below:

- **Result in less than two emergency access routes for streets exceeding 600 feet in length unless otherwise determined to be acceptable by the Fire Chief, or his/her designee, in specific instances due to climatic, geographic, topographic, or other conditions.** The VMP would be limited to vegetation management activities and would not change the design or configuration of any streets; thus, it would not affect the number of emergency access routes for existing streets exceeding 600 feet in length.

- **For a project located within an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, result in a safety hazard or excessive noise for people residing or working in the project area.** None of the treatment areas are within 2 miles of an airport or within an airport land use compatibility plan area. Therefore, there is no potential for VMP activities to subject people to hazards or excessive noise from being located an airport land use compatibility plan area or within close proximity to an airport.

- **Expose people or structures, either directly or indirectly, to a significant risk of loss, injury, or death involving wildland fires.** Potential wildland fire effects on people or structures are evaluated and described in Section 3.14, "Wildfire."

Environmental Impacts

Impact HAZ-1: Create a Significant Hazard to the Public or the Environment from the Routine Transport, Use, or Disposal of Hazardous Materials (*Less than Significant with Mitigation*)

Implementation of the VMP would have a beneficial effect on public safety, as it would remove dead/hazardous trees in areas near public trails and roads; however, some treatment

techniques would involve transport, use, and potential disposal of hazardous materials, which would have potential to create a hazard to the public or the environment. The different treatment techniques that would be used under the VMP and their relative potential to create a significant hazard to the public or the environment are discussed below.

Grazing

As described in Chapter 2, *Project* Description, livestock grazing (e.g., goats, cattle, sheep) is the primary biological treatment technique that would be used for the VMP. Grazing would have limited potential to create a hazard to the public or environment from the routine transport, use, or disposal of hazardous materials. In general, livestock grazing would not use hazardous materials. Transport of herds to treatment areas may involve the use of trucks or trailers, which would contain hazardous materials, such as fuel, oil, and lubricants. Implementation of **Mitigation Measure HAZ-1 (Vehicle and Equipment Maintenance)** and **Mitigation Measure HAZ-2 (Vehicle and Equipment Fueling)** would ensure that vehicles and equipment used to transport and manage herds are properly maintained, and that any fueling or repairs is done in safe areas to minimize potential risks to people and the environment.

Hand Labor Techniques

Some hand labor techniques (e.g., use of chainsaws and weed whips) may use small amounts of hazardous materials, such as fuel, oil, and lubricants. In general, hand labor treatment techniques would not involve the transport, use, or disposal of any hazardous materials. For any hand labor equipment that requires maintenance or fueling, implementation of Mitigation Measures HAZ-1 and HAZ-2 would ensure that the risks from these activities are minimized and that equipment is properly maintained such that potential for leaks of hazardous materials is reduced.

Mechanical Techniques

Mechanical treatment techniques would have elevated potential to create hazards to the public or environment from transport, use, and disposal of hazardous materials compared to biological and hand labor techniques. Mechanical equipment such as mowers, dickers, masticators, and feller-bunches would use greater quantities of hazardous materials (e.g., fuel, oil, lubricants), which may need to be stored temporarily at a treatment site and/or transported or disposed of periodically. If these materials were improperly handled/ managed, it could subject workers, the public, and the environment to a significant hazard.

Under the VMP, hazardous materials would be disposed of at licensed facilities and in accordance with federal, state, and local laws and regulations. Further, **Mitigation Measure HAZ-3 (On-Site Hazardous Materials Management)** would require that hazardous materials used at treatment sites are inventoried and stored properly (watertight containers or enclosed storage shed with secondary containment). Implementation of Mitigation Measures HAZ-1 and HAZ-2 would ensure that risks to people and the environment from vehicle and equipment maintenance and fueling are minimized. Properly maintained mechanical equipment also would be less likely to leak hazardous materials to the environment during mechanical treatment activities.

Herbicides

Chemical treatment techniques would include use of herbicides to kill vegetation or prevent growth. Herbicides are toxic substances that can be harmful to humans and non-target plants and animals when mishandled or used ineffectively. Under the VMP, both the cut and daub method and backpack spraying may be used, with the latter method primarily being used for application on high fire risk plants including French broom, Scotch broom, pampas grass and jubata grass. As described in Chapter 2, *Project* Description*,* herbicide application under the VMP must be done by a licensed and trained professional and herbicides are only applied by a prescription prepared by a licensed pest control advisor in accordance with federal, state, and local regulations and labeled specifications.

Under FIFRA, all pesticides/herbicides registered for use in the U.S. are evaluated for potential adverse effects on humans and the environment and label instructions are developed for safe use. Herbicide labels would indicate appropriate PPE for herbicide applicators, and OSHA regulations also would require that the City of Oakland or its contractors provide herbicide applicators with PPE during VMP chemical treatment activities to minimize their potential health risks.

Glyphosate and triclopyr are both common herbicides that have been used in the U.S. and California for decades. Glyphosate was first registered for use in the U.S. in 1974 (USEPA 2020a), while triclopyr was first registered in 1979 (National Pesticide Information Center 2018). Both chemicals are included in hundreds of different commercial products and commonly used for a variety of applications, including for managing vegetation in rights-of-way, pasture and rangelands, and landscaping. Since glyphosate's first registration, USEPA has reviewed and reassessed its safety and uses on a 15-year cycle as part of the registration review program. As of January 2020, USEPA continues to find that there are no risks of concern to human health when glyphosate is used in accordance with its current label (USEPA 2020a). USEPA also found that glyphosate is unlikely to be a human carcinogen (USEPA 2020a). Like glyphosate, triclopyr has undergone reregistration by USEPA. While triclopyr was found to be slightly toxic by oral and dermal routes (and thereby placed in Toxicity Category III for these effects), it was ultimately found to be safe for use when following label requirements, including updated risk mitigation measures imposed by USEPA (USEPA 1998).

Other chemicals proposed for use in the VMP also generally have low toxicity to humans and have been shown to be safe for use when applied in accordance with label instructions. **Table 3.8-3** shows toxicity information for chemicals used in vegetation management, as identified and evaluated in California Board of Forestry and Fire Protection's California Vegetation Treatment Program (CalVTP) EIR (California Board of Forestry and Fire Protection 2019).

Table 3.8-3. Human Toxicity of Chemicals Used in Vegetation Management

Chemical	Formulation	Human Toxicity
Glyphosate[1] (Accord) (Rodeo)	Isopropylamine salt, potassium salt, dimethylamine salt & diammonium salt	Overall low toxicity. Skin and eye irritation possible. No evidence of neurotoxicity, immunotoxicity, or acute toxicity. Reproductive toxicity at very high doses. Recent claims of carcinogenicity (class 2A) based on animal studies. Substantial evidence finds human carcinogenicity unlikely. Very low toxicity via oral and dermal routes. Possible endocrine-disruptor.[2]
Imazapyr (Imazapyr 2SL)	Isopropylamine salt	Overall low toxicity. No evidence of carcinogenicity, neurotoxicity, immunotoxicity, or reproductive/developmental toxicity. Slightly toxic via acute oral, dermal, and inhalation routes. No evidence of carcinogenicity or mutagenicity.
Triclopyr (Turflon Ester) (Garion 3) (Garion 4)	Butoxyethyl ester & trimethylamine salt	Overall low toxicity (moderate toxicity if ingested) (technical triclopyr acid). Slightly toxic via acute oral, dermal, and inhalation routes (TEA and TBEE). Slightly toxic by acute oral and dermal routes. Practically nontoxic by inhalation. Not carcinogenic (technical triclopyr acid). Slightly toxic via acute oral, dermal, and inhalation routes (TEA and TBEE) slightly toxic by acute oral and dermal routes. Practically nontoxic by inhalation. Not carcinogenic.

Notes: TBEE = triclopyr, butoxylethyl ester; BEA = triclopyr, triethylamine salt.

1. Table 3.10-1 from the CalVTP EIR specifically lists Roundup products, but the analysis in Appendices HAZ-1 and HAZ-2 of the CalVTP EIR considers potential human health impacts from glyphosate generally (including other product formulations). Thus, the conclusions of overall low toxicity and unlikely human carcinogenicity would apply to other products using glyphosate as an active ingredient (e.g., Rodeo and Accord). USEPA's pesticide/herbicide registration process considers the identity and quantity of all chemicals in the product, including any inactive or inert ingredients that could potentially pose a health hazard.
2. The large majority of medical and scientific research supports the conclusion that glyphosate is not a likely carcinogen. Although glyphosate has been listed under Proposition 65 based on the International Agency for Research on Cancer's (IARC) classification of glyphosate as probably carcinogenic (based on one study in mice), federal courts in two separate decisions found that California could not require warnings on glyphosate products because warnings stating that glyphosate is a carcinogen are misleading, and that requiring the warnings would violate the First Amendment. In 2020, Judge Shubb in the District Court for the Eastern District of California found that "the Proposition 65 warning requirement for glyphosate was false and misleading given the weight of authority" and issued a permanent injunction preventing the state of California from requiring warnings on glyphosate products. The Court relied upon decades of actual laboratory and field testing of glyphosate that conclude that glyphosate is not likely to be carcinogenic to humans and that no other meaningful risks to human health occur when the product is used according to the label. Recent expert panels have been convened to directly evaluate the claims of the IARC that glyphosate is carcinogenic to humans. Reports of these panels strongly counter that claim and indicate there is insufficient evidence that

glyphosate is carcinogenic. (Appendix HAZ-1 of the CalVTP EIR for more detailed information regarding glyphosate and human health risks. Although several juries have awarded damages to plaintiffs alleging personal injuries as a result of exposure to Roundup, there is significant question regarding the toxicological basis for these verdicts.

Source: California Board of Forestry and Fire Protection 2019

Herbicides proposed for use under the VMP only include materials that have been approved for use by the USEPA and that were also evaluated by the Cal VTP as safe for use. Under the VMP, treatment areas with the greatest risk for adverse effects to people or the environment from chemical techniques would likely be urban and residential parcels, canyon areas that are parkland and publicly-accessible, and city parklands and open space areas. Ridgetop areas that are not typically accessible via public-use trails and roadways and medians would have less potential for people or pets to inadvertently enter areas treated with herbicides prior to the point at which it would be safe for reentry. Less publicly-accessible VMP areas also would have reduced potential for people or pets to be subjected to herbicide exposure from off-site drift of herbicides during spray application methods (although herbicide label instructions typically include measures to reduce potential for off-site drift). If members of the public or their pets were to be exposed to herbicide residues or airborne droplets in any VMP treatment area type, this would be a potentially significant impact.

To ensure herbicide label reentry intervals are properly enforced and to reduce the potential for public exposure to herbicides from off-site drift in the context of the VMP, **Mitigation Measure HAZ-4 (Measures to Avoid or Minimize Adverse Effects on People, Pets, or Other Non-Target Organisms from Use of Herbicides)** would be implemented. Additionally, implementation of **Mitigation Measure HAZ-5 (Standard Herbicide Use Requirements)** would reduce potential impacts by limiting use of herbicides near schools; requiring that herbicides are not applied in upland areas within 48 hours of predicted rainfall (i.e., to prevent off-site movement of herbicides); requiring that the lowest recommended rates of herbicides are used to achieve project objectives, and other measures.

As discussed previously, implementation of Mitigation Measure HAZ-3 would minimize potential hazards from storage of chemicals on-site at treatment sites prior to chemical treatments. Under this mitigation measure, chemicals would be inventoried and labeled on-site and secondary containment would be provided to prevent any spills or leakage.

Mitigation Measures

The following mitigation measures would be implemented to reduce Impact HAZ-1:

Mitigation Measure HAZ-1: Vehicle and Equipment Maintenance (VMP BMP GEN-8)

The City and its contractors shall implement the following measures:

- All vehicles and equipment shall be kept clean. Excessive buildup of oil and grease shall be prevented.
- Incoming vehicles and equipment (including delivery trucks and employee and subcontractor vehicles) shall be checked for leaking oil and fluids. Leaking vehicles or equipment shall not be allowed on-site.

- No heavy equipment shall operate in a running stream.
- No equipment shall be serviced in the creek channel or immediate floodplain.
- If necessary, servicing of equipment at the job site shall be conducted in a designated, protected area to reduce threats to water quality from vehicle fluid spills. Designated service areas shall not connect directly to the ground, surface water, or storm drain system. The service area shall be clearly designated with berms, sandbags, or other barriers. Secondary containment, such as a drain pan, shall be used to catch spills or leaks when removing or changing fluids. Fluids shall be stored in appropriate containers with covers, and recycled or disposed of properly off-site.
- If emergency repairs are required in the field, only those repairs necessary to move equipment to a more secure location shall be conducted in the channel or floodplain.
- Equipment shall be cleaned of any sediment or vegetation before being transferred and used in a different watershed, to avoid spreading sediment, pathogens, or exotic/invasive species.
- Vehicle and equipment washing can take place on-site only as needed to prevent the spread of sediment, pathogens, or exotic/invasive species. No runoff from vehicle or equipment washing shall be allowed to enter water bodies, including creek channels and storm drains, without being subjected to adequate filtration (e.g., vegetated buffers, hay wattles or bales, and silt screens). The discharge of decant water from any on-site wash area to water bodies or areas outside of the active project site is prohibited.

Mitigation Measure HAZ-2: Vehicle and Equipment Fueling (VMP BMP GEN-9)

The City and its contractors shall implement the following measures:

- No fueling shall be done in stream channels (top-of-bank to top-of-bank) or immediate floodplain.
- All off-site fueling sites (i.e., on access roads above the top-of-bank) shall be equipped with secondary containment and avoid a direct connection to soil, surface water, or the storm drainage system.
- For stationary equipment that must be fueled on-site, secondary containment, such as a drain pan or drop cloth, shall be used to prevent accidental spills of fuels from reaching soil, surface water, or the storm drain system.

Mitigation Measure HAZ-3: On-Site Hazardous Materials Management (VMP BMP GEN-5)

The City and its contractors shall implement the following measures:

- An inventory of all hazardous materials used (and/or expected to be used) at the work site and the end products that are produced (and/or expected to be produced) after their use shall be maintained by the worksite manager.

- As appropriate, containers shall be properly labeled with a "Hazardous Waste" label and hazardous waste shall be recycled or disposed of properly off-site at an appropriate hazardous waste facility.

- Contact of chemicals with precipitation shall be minimized by storing chemicals in watertight containers or in a storage shed (completely enclosed), with appropriate secondary containment to prevent any spillage or leakage.

- Petroleum products, chemicals, cement, fuels, lubricants, non-storm-drainage water, and water contaminated with the aforementioned materials shall not contact soil and shall not be allowed to enter surface waters or the storm drainage system.

- All toxic materials, including waste disposal containers, shall be covered when not in use and located as far as possible from any direct connection to the storm drainage system or surface water.

- All trash that is brought to a project site during maintenance activities (e.g., plastic water bottles, lunch bags or other trash) shall be removed from the site daily.

Mitigation Measure HAZ-4: Measures to Avoid or Minimize Adverse Effects on People, Pets, or Other Non-Target Organisms from Use of Herbicides

The City of Oakland or its contractors shall implement the following measures to avoid or minimize effects on non-target entities from application of herbicides for the VMP:

- Reentry intervals included on the product label shall be followed and enforced for workers and the public. In instances where a reentry interval is not provided on the herbicide product label, a reentry interval of at least 48 hours shall be implemented. Signs shall be installed on all sides of the treatment area clearly stating the date of treatment and reentry interval, and describing potential hazards to people and pets from entering the area prior to the close of the reentry interval.

- Where herbicides are applied in public parks or publicly-accessible areas or in open space areas within 30 feet of public-use trails, or in any other situations where it is reasonably possible that people or pets could enter treated areas, fencing or other material preventing entry shall be temporarily installed around the treated area for the duration of the reentry interval to prevent access.

- Spray application methods shall not be used when wind velocities are greater than 7 miles per hour. Spray application methods shall not be used within 100 feet of any residences or public use areas.

Mitigation Measure HAZ-5: Standard Herbicide Use Requirements (VMP BMP VEG-2)

The City and its contractors shall implement the following measures:

- Herbicides shall not be used in areas within 0.25 mile of schools. Only hand or mechanical vegetation removal shall be used within 0.25 mile of schools.
- Herbicides (if selected as a vegetation management technique) shall be applied only if hand or mechanical vegetation removal is not feasible, and at no times within 0.25 mile of schools as described above.
- Only herbicides and surfactants that have been approved for use by the U.S. Environmental Protection Agency (USEPA) and are registered for use by the California Department of Pesticide Regulation (CDPR) shall be used for vegetation control activities.
- Herbicide application shall be consistent with Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) label instructions and use conditions issued by USEPA, CDPR, and the Alameda County Agricultural Commissioner.
- Herbicides shall not be applied within 48 hours of predicted rainfall.
- The lowest recommended rates of herbicides and surfactants that achieve project objectives shall be utilized to achieve desired control. Cut-and-daub application of herbicides shall be used where feasible to reduce the amount of herbicide used. This is anticipated to be on the stumps of removed eucalyptus and acacia trees.
- An indicator dye may be added to the tank mix to help the applicator identify areas that have been treated and to better monitor the overall application.
- Herbicides shall not be applied in open water or within 60 feet of streams.

Conclusion

Implementation of the VMP would have a largely beneficial effect on public safety from removal of dead/hazardous trees in public parks and along public trails. While some treatment techniques would use hazardous materials, impacts would be avoided or greatly reduced through compliance with existing federal, state, and local laws and regulations related to hazardous materials, and implementation of Mitigation Measures HAZ-1 through HAZ-5. As a result, this impact would be **less than significant with mitigation.**

Impact HAZ-2: Create a Significant Hazard to the Public or the Environment through the Reasonably Foreseeable Upset and Accident Conditions Involving the Release of Hazardous Materials into the Environment (*Less than Significant with Mitigation*)

Wildland fire within the VMP area could spread to adjacent areas, resulting in burning and subsequent release of hazardous materials from buildings and vehicles. Implementation of the

VMP would reduce the risk of wildfire within the VMP area, thus reducing the risk of hazardous material release due to wildfire.

As discussed in Impact HAZ-1, several of the proposed treatment techniques would involve use of hazardous materials. Particularly for mechanical and chemical techniques, hazardous materials (e.g., fuel, oil, lubricant, accelerants, and herbicides) may need to be stored temporarily at VMP treatment sites, staging areas, or at the City of Oakland's or its contractors' maintenance yards. Fueling and maintenance of vehicles and equipment at VMP treatment sites would also introduce the potential for upset or accident conditions.

If hazardous materials were not stored/managed properly, this could potentially lead to accidental, uncontrolled releases of these materials, which could pose a significant hazard to the public or the environment. For example, storage of hazardous materials at VMP treatment sites without secondary containment (i.e., a secondary structure or catchment device that would contain the volume of material in case the primary containment fails) could potentially lead to quantities of these materials being released to the environment. The impacts of such an event would be compounded if hazardous materials clean-up materials were not readily available to staff on-site.

Implementation of Mitigation Measures HAZ-1 through HAZ-3 would minimize the potential for accidental release of hazardous materials to the environment. In particular, Mitigation Measure HAZ-3 would require that chemicals are stored in watertight containers or in an enclosed storage shed with appropriate secondary containment. Mitigation Measures HAZ-1 and HAZ-2 would require that vehicle and equipment maintenance and fueling do not occur in sensitive areas (e.g., within or near streambanks), and Mitigation Measure HAZ-2 would require that all off-site fueling sites are equipped with secondary containment and avoid a direct connection to soil, surface water, or the storm drainage system.

Additionally, implementation of **Mitigation Measure HAZ-6 (Spill Prevention and Response)** would further reduce the potential for accidental release of hazardous materials from VMP activities and would mitigate the impacts to people and the environment in the event that hazardous materials are accidentally released. As described below, Mitigation Measure HAZ-6 would, among other things, require that City of Oakland field personnel are trained in spill prevention, hazardous material control, and cleanup of accidental spills; equipment and materials for cleanup of spills are available on-site at all times; and spill prevention kits are always in close proximity when personnel are using hazardous materials.

Although spills of substantial quantities of acutely hazardous materials during VMP activities would be unlikely, in the event of a substantial spill, state and local agencies would be able to provide an effective response through the coordination, planning, and training provided under the California Emergency Services Act.

Mitigation Measures

The following mitigation measures would be implemented to reduce Impact HAZ-2:

Mitigation Measure HAZ-1: Vehicle and Equipment Maintenance (VMP BMP GEN-8)

See text in Impact HAZ-1 above.

Mitigation Measure HAZ-2: Vehicle and Equipment Fueling (VMP BMP GEN-9)

See text in Impact HAZ-1 above.

Mitigation Measure HAZ-3: On-Site Hazardous Materials Management (VMP BMP GEN-5)

See text in Impact HAZ-1 above.

Mitigation Measure HAZ-6: Spill Prevention and Response (VMP BMP GEN-7)

City personnel shall prevent the accidental release of chemicals, fuels, lubricants, and non-storm-drainage water into channels by following these measures:

2. New City field personnel shall be trained appropriately in spill prevention, hazardous material control, and cleanup of accidental spills.

3. Equipment and materials for cleanup of spills shall be available on site at all times, and spills and leaks shall be cleaned up immediately and disposed of at a hazardous waste facility.

4. City field personnel shall ensure that hazardous materials are handled properly, and natural resources are protected by all reasonable means.

5. Spill prevention kits shall always be in close proximity when City personnel are using hazardous materials (e.g., at crew trucks and other reasonable locations). All City field personnel shall be advised of these locations.

6. City personnel shall routinely inspect the work site, vehicles, and equipment to verify that spill prevention and response measures are implemented and maintained properly. All leaks shall be repaired promptly. Drip pans shall be used to catch leaks until repairs are made.

    - For small spills on impervious surfaces, absorbent materials shall be used to remove the spill, rather than hosing it down with water. For small spills on pervious surfaces such as soil, the spill area shall be excavated and properly disposed of rather than being buried. Absorbent materials shall be collected and disposed of properly and promptly.

    - All significant spills of hazardous materials, including oil, shall be reported immediately. To report a spill: (1) Dial 911 or your local emergency response number; and (2) Call the Governor's Office of Emergency Services Warning Center, (800) 852-7550 (24 hours).

Conclusion

Implementation of the VMP would require use of hazardous materials, which could be accidentally released to environment, thereby endangering the public, if adequate precautions are not taken. Implementation of Mitigation Measures HAZ-1, HAZ-2, HAZ-3, and HAZ-6 would substantially reduce the potential for upset or accident conditions involving release of hazardous materials and would reduce the adverse effects to people and the environment if an

accidental release were to occur. As a result, this impact would be **less than significant with mitigation**.

Impact HAZ-3: Create a Significant Hazard to the Public through the Storage or Use of Acutely Hazardous Materials near Sensitive Receptors *(Less than Significant with Mitigation)*

As discussed under Impacts HAZ-1 and HAZ-2 above, the VMP would involve use of hazardous materials contained in mechanical equipment and herbicides. These materials also may need to be stored temporarily at treatment sites. Many of the treatment areas under the VMP would be located near sensitive receptors, such as residential uses, schools, parks, and daycare centers. While these activities could potentially create a significant hazard to the public (e.g., if hazardous materials used in VMP activities were improperly stored and inadvertently released to the environment or if herbicides were applied in a manner that is inconsistent with the product label); however, implementation of the mitigation measures described above and compliance with existing laws and regulations related to hazardous materials would reduce the potential hazards to a level that is less than significant.

Specifically, Mitigation Measure HAZ-3 would require that containers of hazardous materials (e.g., herbicides) or waste are properly labeled and provided with secondary containment to prevent spillage or leakage. Mitigation Measure HAZ-4 would ensure that reentry intervals for herbicides are followed and enforced for workers and members of the public, thereby avoiding the risk of toxicity effects from reentering a treated area too quickly. This mitigation measure also would limit the use of herbicide spray application methods during windy conditions and within close proximity to residences. Further, Mitigation Measure HAZ-5 would require that herbicides not be used within 0.25 mile of schools (only hand or mechanical vegetation removal techniques would be used within 0.25 mile of schools). All of these measures would minimize the potential for hazards, as would compliance with herbicide product labels developed in accordance with FIFRA.

The VMP would not create any new permanent sources of hazardous emissions. As discussed in Section 3.3, “Air Quality,” and in Impact HAZ-4 below, emissions from VMP activities would primarily be related to combustion of fuel in internal combustion engines (used in mechanical treatment techniques and during transport of materials). Some emissions also would occur from spray herbicide applications, although the requirements under Mitigation Measures HAZ-4 and HAZ-5 would limit these emissions from occurring in close proximity to sensitive receptors. In general, any potential exposure of sensitive receptors at residences, schools, parks or daycare facilities would be temporary and the pollutant concentrations would likely be significantly diluted by the time they reach these receptors. No nursing homes or medical facilities were identified within the VMP area.

Given that ERPG exposure level 2 is “the maximum airborne concentration below which nearly all individuals could be exposed for up to one hour without experiencing or developing irreversible or other serious health effects or symptoms which could impair an individual’s ability to take protective action” (BAAQMD 2017), the VMP would not place individuals within these conditions and/or above this exposure level. The emissions of criteria pollutants from VMP activities would be marginally above baseline conditions and well below BAAQMD air quality thresholds of significance (see Table 3.3-7 in Section 3.3). The DPM emissions associated

with off-road mechanical equipment operation under the VMP would be temporary in any given location and concentrations of mobile source DPM emissions are typically reduced by 70 percent at a distance of approximately 500 feet (CARB 2005). As described in Section 3.3, "Air Quality," DPM exposure for short durations is generally not quantified as cancer potency factors are based on lifetime exposure (OEHHA 2015). As such, any DPM exposure due to the VMP would not reasonably be expected to result in any adverse short- or long-term health impacts.

Mitigation Measures

The following mitigation measures would be implemented to reduce Impact HAZ-3:

Mitigation Measure HAZ-3: On-Site Hazardous Materials Management (VMP BMP GEN-5)

See text in Impact HAZ-1 above.

Mitigation Measure HAZ-4: Measures to Avoid or Minimize Adverse Effects on People, Pets, or Other Non-Target Organisms from Use of Herbicides

See text in Impact HAZ-1 above.

Mitigation Measure HAZ-5: Standard Herbicide Use Requirements (VMP BMP VEG-2)

See text in Impact HAZ-1 above.

Conclusion

Implementation of the VMP would require use and storage of hazardous materials, including in areas near sensitive receptors, which could result in adverse impacts if adequate precautions are not taken. Implementation of Mitigation Measures HAZ-3, HAZ-4, and HAZ-5 would reduce the potential to create a significant hazard to the public through the storage or use of acutely hazardous materials near sensitive receptors to a level that is less than significant. The VMP would not subject any individuals to ERPG exposure level 2 conditions. As a result, this impact would be **less than significant with mitigation**.

Impact HAZ-4: Emit Hazardous Emissions or Handle Hazardous or Acutely Hazardous Materials, Substances, or Wastes within 0.25 Mile of an Existing or Proposed School (*Less than Significant with Mitigation*)

As shown in Table 3.8-1, a number of schools are located within 0.25 mile of proposed VMP treatment areas. Therefore, VMP activities would occur within proximity to existing schools. Mechanical treatment techniques, as well as some hand labor techniques (e.g., chainsaws), would emit some hazardous emissions (e.g., DPM) from operation of internal combustion engines. In general, these emissions would be similar to the emissions from any type of construction project and would be temporary in any given location. See Section 3.3, "Air Quality," for additional discussion and estimates of criteria pollutant emissions from VMP activities as compared to baseline conditions. Due to the relatively minor and temporary nature of these types of hazardous emissions associated with VMP activities, these techniques would not pose a substantial threat to the health of school students or staff.

As described in Impact HAZ-1, chemical treatment techniques would include the use of spray methods to apply herbicide over larger areas to control vegetation and reduce fire risk. If spray methods were used in close proximity to schools, such that airborne herbicide droplets could drift or inadvertently enter school grounds and thereby expose children and staff to inhalation, this would result in a significant impact. Mitigation Measure HAZ-5 would prohibit the use of herbicides within 0.25 mile of a school. Additionally, this measure would require that the lowest recommended rates of herbicides be used in all instances. Herbicide product labels typically include measures to prevent off-site drift of herbicides and require that herbicide products are not applied in a way to contact people, either directly or through drift. Additionally, Mitigation Measure HAZ-4 would include measures to prevent off-site drift and public exposure to herbicides specifically in the context of the VMP.

Given the above measures, chemical treatment methods involving spraying of herbicides within 0.25 mile of a school would not create a significant hazard. Cut-and-daub chemical application methods would not reasonably create emissions or volatilized/airborne herbicide particles, and thus would not pose such a hazard if conducted in proximity to a school.

Mitigation Measures

The following mitigation measures would be implemented to reduce Impact HAZ-4:

Mitigation Measure HAZ-4: Measures to Avoid or Minimize Adverse Effects on People, Pets, or Other Non-Target Organisms from Use of Herbicides

See text in Impact HAZ-1 above.

Mitigation Measure HAZ-5: Standard Herbicide Use Requirements (VMP BMP VEG-2)

See text in Impact HAZ-1 above.

Conclusion

While several treatment techniques under the VMP could create hazardous emissions and be located within 0.25 mile of a school, the emissions would be relatively minor and temporary and/or would be minimized through implementation of Mitigation Measures HAZ-4 and HAZ-5 and compliance with existing laws and regulations. Therefore, this impact would be **less than significant with mitigation.**

Impact HAZ-5: Be Located on a Site that Is Included on a List of Hazardous Materials Sites Compiled Pursuant to California Government Code Section 65962.5, and as a Result, Create a Significant Hazard to the Public or the Environment *(Less than Significant with Mitigation)*

As indicated in Table 3.8-1**Table 3.8-1.** Public Schools within 0.25 Mile of VMP Treatment Projects

School			Distance to VMP Areas (feet)
Name	**Address**	**Grades**	
East Bay Innovation Academy	3400 Malcolm Avenue	6-12	82.6
Castlemont High	8601 MacArthur Boulevard	8-12	291.8
LPS Oakland R & D Campus	8601 MacArthur Boulevard	9-10	313.6
Castlemont Primary Academy	8711 MacArthur Boulevard	K-5	300.9
Castlemont Junior Academy	8711 MacArthur Boulevard	6-8	308.0
Hillcrest Elementary	30 Marguerite Drive	K-8	0.0
Bay Area Technology	8251 Fontaine Street	6-12	278.1
Rudsdale Continuation	8251 Fontaine Street	10-12	246.0
Independent Study, Sojourner Truth	8251 Fontaine Street	1-12	258.6
Montclair Elementary	1757 Mountain Boulevard	K-5	131.3
Glenview Elementary	4215 La Cresta Avenue	K-5	964.3
Parker Elementary	7929 Ney Avenue	K-5	1,046.0
Grass Valley Elementary	4720 Dunkirk Avenue	K-5	554.9
Chabot Elementary	6686 Chabot Road	K-5	701.3
Conservatory of Vocal/Instrumental Arts	3800 Mountain Boulevard	K-9	811.2
Community School for Creative Education	8755 Fontaine Street	K-4	258.2
Howard Elementary	8755 Fontaine Street	K-5	244.3
Kaiser Elementary	25 South Hill Court	K-5	544.8
Community Day	4917 Mountain Boulevard	9-12	0.0
Oakland Community Day Middle	4917 Mountain Boulevard	7-8	0.0
Francophone Charter School of Oakland	9736 Lawlor Street	K-8	118.5
Carl B. Munck Elementary	11900 Campus Drive	K-5	219.1
Joaquin Miller Elementary	5525 Ascot Drive	K-5	506.4
Montera Middle	5555 Ascot Drive	6-8	516.6
Burckhalter Elementary	3994 Burckhalter Avenue	K-5	329.5
Redwood Heights Elementary	4401 39th Avenue	K-5	150.6

, no VMP treatments are currently proposed to be located on open/active known hazardous materials cleanup sites. Several Liquid Underground Storage Tank (LUST) sites are located on or within proposed VMP treatment areas, but cleanup of these sites has been completed. Hazardous materials contamination generally is contained in soil or groundwater. As such, treatment methods that involve ground-disturbance would have the greatest potential to release contaminants to the environment and expose workers. To the extent that future VMP activities could be located on known active or open hazardous materials sites, **Mitigation Measure HAZ-7 (Review Proximity of Proposed Treatment Sites to Known Hazardous Materials Clean-up Sites and Implement Safety Measures)** would be implemented. This mitigation measure would substantially reduce the potential hazards to workers, the public, and the environment from conducting VMP activities on known hazardous materials sites.

In addition to known hazardous materials cleanup sites, it is also possible for VMP treatment activities to encounter unknown hazardous contaminants, including discarded household hazardous items (e.g., oil, batteries, paint cans, etc.). Implementation of **Mitigation Measure HAZ-8 (Existing Hazardous Materials)** would reduce potential impacts to workers and the public from encountering these types of materials. Additionally, to prevent or minimize potential impacts from ground-disturbing VMP treatment activities (e.g., disking, grading) encountering unknown sources of contaminated soil or groundwater, **Mitigation Measure HAZ-9 (Proper Handling and Disposal of Contaminated Soil and Groundwater)** would be implemented.

Mitigation Measures

The following mitigation measures would be implemented to reduce Impact HAZ-4:

Mitigation Measure HAZ-7: Review Proximity of Proposed Treatment Sites to Known Hazardous Materials Clean-up Sites and Implement Safety Measures

The City of Oakland and/or its contractors shall evaluate the proximity of proposed treatment sites to known hazardous material cleanup sites. This review shall include examination of the planned treatment activity footprint in relation to records of hazardous materials sites in the State Water Resources Control Board's GeoTracker database and the Department of Toxic Substances Control’s EnviroStor database.

If the proposed treatment activity is located on or within 100 feet of a documented hazardous material contamination site, for which cleanup activities have not been completed or successful, the City of Oakland and/or its contractors shall commission a Phase I Environmental Site Assessment to more full characterize the past land uses and potential for soil and/or groundwater contamination to occur at or in close proximity to the site.

If the Phase I Environmental Site Assessment demonstrates a reasonable likelihood that contamination remains within the proposed treatment activity’s area of disturbance, the City of Oakland and/or its contractors shall commission a Phase II Environmental Site Assessment, including soils testing, to characterize the extent of the contamination and develop ways to avoid the contaminated areas during treatment activities. Alternatively, if the Phase I Environmental Site Assessment demonstrates no potential for soil vapor off-gassing of hazardous gases, then non-ground-disturbing treatment methods may be used on the site. The City of Oakland shall follow all recommendations

of the Phase II Environmental Site Assessment and conduct the proposed treatment to avoid areas of contamination, to the extent feasible. In the event that it is not feasible to avoid all areas of contamination, the City of Oakland and/or its contractors shall follow all applicable laws regarding management of hazardous materials and wastes. This includes proper disposal of any contaminated soil in a hazardous waste landfill, and ensuring that workers are provided with adequate personal protective equipment to prevent unsafe exposure.

Mitigation Measure HAZ-8: Existing Hazardous Materials (VMP BMP GEN-6)

The City and its contractors shall implement the following measures:

- If previously unknown hazardous contaminants, including oil, batteries, or paint cans, are encountered during vegetation management work, City personnel will carefully remove and dispose of hazardous materials at an appropriate hazardous waste disposal facility. In the event that hazardous contaminates are discovered that are beyond the means of the City's disposal capabilities, then the City will contact Alameda County Public Health Department to determine what measures need to be implemented to address the hazardous materials and ensure that the work site is safe for people and the environment.

- City personnel will wear proper protective gear when handling hazardous materials. All contaminated materials will be stored in appropriate hazardous waste containers for transport and disposal at a permitted hazardous waste facility.

Mitigation Measure HAZ-9: Proper Handling and Disposal of Contaminated Soil and Groundwater

Prior to initiating ground-disturbing activities (e.g., disking, grading, etc.), the City of Oakland or its contractors will inspect the soil or groundwater (if readily observable) for the presence of possible contamination. If indicators of contamination (e.g., foul odor, staining or sheen, etc.) are found, the City of Oakland or its contractors will then test the soil or groundwater. If the lab results confirm contamination is present, the soil or groundwater will be treated as hazardous and any contaminated materials will be disposed of at an approved hazardous waste disposal facility. In removing potentially contaminated soil or groundwater, workers will wear protective clothing and equipment to limit their exposure.

Conclusion

Although no VMP treatment activities are currently proposed on known hazardous materials sites, future VMP treatment sites could potentially be located on or in close proximity to known or unknown hazardous materials sites. Implementation of Mitigation Measures HAZ-7 through HAZ-9 would ensure that VMP workers, the public, or the environment are not subjected to a significant hazard from location of treatment activities on hazardous materials sites. Therefore, this impact would be **less than significant with mitigation.**

Impact HAZ-6: Impair Implementation of or Physically Interfere with an Adopted Emergency Response Plan or Emergency Evacuation Plan (*Less than Significant with Mitigation*)

One of the primary goals of the VMP is to reduce wildfire hazard along critical access and egress routes within the City's VHFHSZ. Through the proposed VMP activities, the City of Oakland would reduce wildfire hazards along these critical routes, and thus increase the potential emergency vehicles and personnel to access the VHFHSZ in the event of a fire or other emergency in the area. As such, implementation of the VMP would have a beneficial long-term effect on emergency response and evacuation.

In the short-term, certain VMP activities would have the potential to interfere with an adopted emergency response plan or emergency evacuation plan. As described in Section 3.8.2, many of the roads proposed for treatment in the VMP are also identified evacuation routes in the City of Oakland's General Plan, Safety Element. Operation of heavy mechanical equipment, haul or transport trucks, or chemical spray equipment and vehicles along these roadways during treatment activities could temporarily limit the mobility of emergency response vehicles or cause congestion for residents attempting to evacuate the area. Although full road closures are not anticipated, temporary lane closures may be required for certain VMP activities, which could further hinder emergency response and public vehicle mobility along critical routes. While these effects would not be dissimilar from those potentially caused by any other type of roadway construction project, the impact would be exacerbated if proper traffic management measures are not implemented.

Implementation of **Mitigation Measure TRA-1 (Maintain Traffic Flow)** and **Mitigation Measure TRA-2 (Traffic Control and Public Safety)** would reduce the potential effects of the VMP on emergency response and evacuation by requiring that the City implement traffic management and control measures during applicable activities, including maintaining two-way traffic flow where possible, limiting heavy equipment and haul traffic in residential areas, and implementing measures to guide traffic (e.g., signage and flaggers) and provide safe passage of vehicles. See Section 3.12, "Transportation," for additional discussion of the VMP's potential effects on transportation and traffic.

Mitigation Measures

The following mitigation measures would be implemented to reduce Impact HAZ-5:

Mitigation Measure TRA-1: Maintain Traffic Flow

See text in Section 3.12, "Transportation."

Mitigation Measure TRA-2: Traffic Control and Public Safety

See text in Section 3.12, "Transportation."

Conclusion

The VMP would have a largely beneficial effect on emergency response and evacuation, as it would reduce wildfire hazard along critical ingress/egress routes within the City of Oakland's VHFHSZ. Certain VMP treatment activities could temporarily hinder emergency vehicle

movement and public evacuation mobility, but these effects would be minimized through implementation of Mitigation Measures TRA-1 and TRA-2. As a result, this impact would be **less than significant with mitigation.**

3.9 HYDROLOGY AND WATER QUALITY

This section presents the environmental setting, regulatory setting, and potential impacts of the VMP related to hydrology and water quality. The impact analysis describes the methodology used to evaluate significance and then presents the impact evaluation.

3.9.1 Environmental Setting

Climate and Precipitation

The VMP area is located in the San Francisco Bay Hydrologic Region. This hydrologic region occupies parts of 10 counties, extending from southern Santa Clara County north to Tomales Bay in Marin County, and inland to the confluence of the Sacramento and San Joaquin rivers (California Department of Water Resources [DWR] 2009). The eastern boundary follows the crest of the Coast Range, the highest peaks of which are more than 4,000 feet above sea level. Streams in the region flow into the bay estuary or the Pacific Ocean (DWR 2009). The San Francisco Bay estuary is fed by freshwater from the Sacramento and San Joaquin rivers, which interacts with salt water from the ocean.

The climate of the San Francisco Bay region is generally cool and foggy along the coast, with warmer Mediterranean-like weather in the inland valleys (DWR 2009). The Oakland area experiences warm, dry summers with maximum daily temperatures averaging 72 to 75 degrees Fahrenheit (°F), and moderate winters with minimum daily temperatures averaging 45 °F to 47 °F. This area receives an average of 23 inches of precipitation per year (Western Regional Climate Center 2020). The VMP area averages from 5-7 hours of fog per day in summer months with areas closer to the Bay experiencing more fog and areas at higher elevations and farther from the bay being less foggy (USGS 2016). Fog drip can be an important source of water for many ecosystems in the Bay Area and contributes to soil moisture during the dry summer months of June through September (USGS 2020), though it contributes less moisture in the late summer and early fall months of September through November, when the fire risk increases.

Surface Water

Multiple surface water features are located in immediate proximity to the VMP area (see Figure 3.4-2 and Table 3.4-5 in Section 3.4, “Biological Resources”). Significant surface water features include (from North to South): Claremont Creek, Temescal Creek, Shephard Creek, Palo Seco Creek, Sausal Creek, Peralta Creek, Courtland Creek, Lion Creek, Horseshoe Creek, Rifle Range Branch, Arroyo Viejo, Elmhurst Creek, Lake Chabot, and San Leandro Creek. These features drain into the San Francisco Bay, which is located roughly 2 to 5 miles southwest of VMP sites. Of these water bodies, Sausal Creek, San Leandro Creek, Lake Chabot, and San Francisco Bay are listed on the CWA 303(d) list of impaired water body segments for multiple contaminants, including chlordane, dichlorodiphenyltrichloroethane (DDT), dieldrin, dioxin compounds, furin compounds, invasive species, mercury, polychlorinated biphenyls (PCBs), and trash (San Francisco Bay RWQCB 2020). **Table 3.9-1** below, provides additional information on 303(d) listed waterbodies in the VMP area and their associated TMDL development status.

Table 3.9-1. 303(d) Listed Waterbodies in the VMP Area

Waterbody	Impairment	TMDL Completed?
Lake Chabot	Chlordane, DDT, Dieldrin, Mercury, PCBs	No
San Leandro Creek	Diazinon, Trash	For Diazinon. Trash being addressed by action other than TMDL.
Sausal Creek	Trash	Addressed by action other than TMDL.
San Francisco Bay, Central	Chlordane, DDT, Dieldrin, Dioxin compounds, Furan compounds, Invasive species, Mercury, PCBs, Selenium, Trash	For Mercury, PCBs, & Selenium

Source: San Francisco Bay RWQCB 2020.

Groundwater

The VMP area is located in the Oakland Hills which serve as a recharge area for the East Bay Plain Subbasin portion of the Santa Clara Valley Groundwater Basin – (2-009.04). The East Bay Plain Subbasin is a northwest trending alluvial plain bounded on the north by San Pablo Bay, on the east by the contact with Franciscan Basement rock, and on the south by the Niles Cone Groundwater Basin (DWR 2003). The East Bay Plain Subbasin extends beneath San Francisco Bay to the west. Historic water levels in the deep aquifer in the basin have varied between 10 and 140 feet below mean sea level since the early 1950s (DWR 2003). The low water level was reached in roughly 1962. Water levels rose about 5 feet per year between 1965 and 1980, and have been rising continuously since then, although at a less rapid rate. As of 2000, water levels were very near surface in all aquifers (DWR 2003).

Flooding

While the VMP area is situated largely in upland areas, small portions of some priority treatment areas are located within FEMA flood hazard zones, including areas around Sausal Creek in Dimond Park, Temescal Creek just upstream of Lake Temescal, and Peralta Creek in Peralta Creek Park.

3.9.2 Regulatory Setting

Federal Laws, Regulations, and Policies

Clean Water Act

The CWA (33 USC Section 1251 et seq.) is the primary federal law that protects the quality of the nation's surface waters, including lakes, rivers, and coastal wetlands. The key sections pertaining to water quality regulation for the VMP are CWA Sections 303, 401, 402, and 404.

Section 303(d) — Listing of Impaired Water Bodies

Under CWA Section 303(d), states are required to identify "impaired water bodies" (those not meeting established water quality standards); identify the pollutants causing the impairment; establish priority rankings for waters on the list; develop TMDLs for these waters; and develop a schedule for the development of control plans to improve water quality. A TMDL includes a calculation of the maximum amount of a pollutant that can be present in a waterbody and still meet water quality standards. USEPA then approves the state's recommended list of impaired waters or adds and/or removes waterbodies.

Section 401 – Water Quality Certification

Section 401 of the CWA requires an evaluation of water quality when a proposed activity requiring a federal license or permit could result in a discharge to waters of the U.S. In California, the SWRCB and its nine RWQCBs issue water quality certifications. Each RWQCB is responsible for implementing Section 401 in compliance with the CWA and its water quality control plan (also known as a Basin Plan). Applicants for a federal license or permit to conduct activities that may result in a discharge to waters of the U.S. (including wetlands or vernal pools) must also obtain a Section 401 water quality certification to ensure that any such discharge will comply with the applicable provisions of the CWA.

Section 402—National Pollution Discharge Elimination Service Permits for Stormwater Discharge

CWA Section 402 regulates stormwater discharges of pollutants to surface waters through the NPDES, which is officially administered by USEPA. In California, USEPA has delegated its authority to the SWRCB, which, in turn, delegates implementation responsibility to the nine RWQCBs, as discussed below in reference to the Porter-Cologne Water Quality Control Act.

The NPDES program provides for both general (those that cover a number of similar or related activities) and individual (activity- or project-specific) permits.

General Permit for Construction Activities: Most projects that disturb 1.0 or more acre(s) of land are required to obtain coverage under SWRCB's General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities (Order 2009-0009-DWQ as amended by 2010-0014-DWQ and 2012-0006-DWQ). The general permit requires that the applicant file a public notice of intent to discharge stormwater and prepare and implement a SWPPP. The SWPPP must include a site map and a description of the proposed activities, demonstrate compliance with relevant local ordinances and regulations, and present a list of BMPs that will be implemented to prevent soil erosion and protect against discharge of sediment and other construction-related pollutants to surface waters. Permittees are further required to monitor construction activities and report compliance to ensure that BMPs are correctly implemented and are effective in controlling the discharge of construction-related pollutants.

Section 404 – Discharges to Waters of the U.S.

Section 404 of the CWA regulates the discharge of dredged and fill materials into waters of the U.S., which includes all navigable waters, their tributaries, lakes and ponds, and impoundments of jurisdictional waters, as well as some wetlands adjacent to the aforementioned waters

(33 CFR Section 328.3). Areas typically not considered to be jurisdictional waters include ephemeral features, diffuse stormwater runoff and directional sheet flow over upland, non-tidal drainage and irrigation ditches excavated on dry land, prior converted cropland, artificially irrigated areas, artificial lakes or ponds used for irrigation or stock watering, small artificial waterbodies such as swimming pools, vernal pools, water-filled depressions, stormwater control features, groundwater recharge structures, water reuse and wastewater recycling structures, and waste treatment systems (33 CFR Section 328.3). Areas meeting the regulatory definition of waters of the U.S. are subject to the jurisdiction of the USACE under the provisions of CWA Section 404. Activities involving placement of fill into jurisdictional waters of the U.S. are regulated by USACE through permit requirements. No USACE permit is effective in the absence of state water quality certification pursuant to Section 401 of CWA.

State Laws, Regulations, and Policies

Porter-Cologne Water Quality Control Act

The Porter–Cologne Water Quality Control Act, California Water Code Section 13000 et seq. (known as the Porter–Cologne Act), passed in 1969, dovetails with CWA (see discussion of the CWA above). It established SWRCB and divided the state into nine regions, each overseen by an RWQCB. SWRCB is the primary State agency responsible for protecting the quality of the state's surface water and groundwater supplies; however, much of the SWRCB's daily implementation authority is delegated to the nine RWQCBs, which are responsible for implementing CWA Sections 401, 402, and 303[d]. In general, SWRCB manages water rights and regulates statewide water quality, whereas RWQCBs focus on water quality within their respective regions. The City of Oakland is under the jurisdiction of the SFBRWQCB.

The Porter–Cologne Act requires RWQCBs to develop water quality control plans (also known as basin plans) that designate beneficial uses of California's major surface-water bodies and groundwater basins and establish specific narrative and numerical water quality objectives for those waters. Beneficial uses represent the services and qualities of a waterbody (i.e., the reasons that the waterbody is considered valuable). Water quality objectives reflect the standards necessary to protect and support those beneficial uses. Basin plan standards are primarily implemented by regulating waste discharges so that water quality objectives are met. Under the Porter–Cologne Act, basin plans must be updated every 3 years.

The San Francisco Bay Water Quality Control Plan (2017), also known as the Basin Plan, lists the following beneficial uses for waterbodies (or watersheds) in the VMP area, as presented in **Table 3.9-2**.

Table 3.9-2. Beneficial Uses in the Alameda County Watersheds

Creek	AGR	MUN	FRSH	IND	COMM	SHELL	COLD	EST	MAR	MIGR	RARE	SPAWN	WARM	WILD	REC-1	REC-2	NAV
South Bay Basin (north to south)																	
Claremont Creek													E	E	E	E	
Temescal Creek							E						E	E	E	E	
Sausal Creek and Tributaries Shephard Creek & Palo Seco Creek							E				E	E	E	E	E	E	
Peralta Creek and Tributary Courtland Creek													E	E	E	E	
Lion Creek and Tributary Horseshoe Creek							E						E	E	E	E	
Rifle Range Branch													E	E	E	E	
Arroyo Viejo							E						E	E	E	E	
Lake Chabot		E			E		E					E	E	E	E*	E	
San Leandro Creek (Lower)			E				E			E	E	E	E	E	E	E	

Notes:

E = Existing Beneficial Use: Indicates an existing beneficial use actually attained in the surface or ground water.

AGR = agricultural supply ; MUN= municipal and domestic water supply; FRSH = freshwater replenishment; IND = industrial service supply; COMM = commercial and sport fishing; SHELL = shellfish harvesting; COLD = cold freshwater habitat; EST = estuarine habitat; MAR = marine habitat; MIGR = fish migration; RARE = preservation of rare and endangered species; SPAWN = fish spawning; WARM = warm freshwater habitat; WILD = wildlife habitat; REC-1 = water contact recreation; REC-2= noncontact water recreation; NAV = navigation.

Source: San Francisco Bay RWQCB 2017.

The Basin Plan contains qualitative and quantitative water quality objectives for bacteria, dissolved oxygen, oil and grease, pH, salinity, sediment and suspended material, tastes and odors, temperature, and other criteria to protect beneficial uses. The following key water quality objectives established in the Basin Plan apply to the proposed program. Where multiple water quality objectives existed, the most conservative metric was selected.

- Dissolved oxygen in non-tidal waters: coldwater habitat – 7.0 milligrams per liter (mg/L); warmwater habitat – 5.0 mg/L
- Temperature: The temperature of any cold or warm freshwater habitat shall not be increased by more than 5 degrees Fahrenheit (°F) (2.8 degrees Celsius [°C]) above the natural receiving water temperature
- Turbidity: Increases from normal background light penetration or turbidity relatable to waste discharge shall not be greater than 10 percent in areas where natural turbidity is greater than 50 Nephelometric Turbidity Units (NTU)

- pH: The pH shall not be depressed below 6.5 or raised above 8.5, which encompasses the pH range usually found in waters within the basin; controllable water quality factors shall not cause changes greater than 0.5 unit in normal ambient pH levels

Sustainable Groundwater Management Act

The Sustainable Groundwater Management Act, California Water Code Section 10720 et seq. (SGMA), passed in 2014, became law in 2015 and created a legal and policy framework to locally manage groundwater sustainably. SGMA allows local agencies to customize groundwater sustainability plans to their regional economic and environmental conditions and needs, and establish new governance structures, known as Groundwater Sustainability Agencies (GSAs). SGMA requires that a groundwater sustainability plan (GSP) be adopted for high and medium priority groundwater basins in California by 2020 for basins with critical overdraft. Low and very low priority basins are not required to adopt GSPs. GSPs are intended to facilitate the use of groundwater in a manner that can be maintained during the planning and implementation horizon without causing undesirable results (e.g., chronic lowering of groundwater levels).

The Santa Clara Valley Groundwater Basin – East Bay Plain Subbasin, within which the VMP is located, is designated as a very low priority basin under SGMA (California Department of Water Resources [DWR] 2018). Therefore, a GSP is not required for this basin.

Local Laws, Regulations, and Policies

Applicable local plans, policies, regulations, and ordinances are presented below.

City of Oakland General Plan

The following objectives, policies, and actions from the City of Oakland General Plan Open Space, Conservation, and Recreation Element, Conservation Chapter (City of Oakland 1996) are relevant to the VMP:

Objective CO-5: Water Quality – To minimize the adverse effects of urbanization on Oakland's groundwater, creeks, lakes, and nearshore waters.

> **Policy CO-5.1: Protection of Groundwater Recharge** – Encourage groundwater recharge by protecting large open space areas, maintaining setbacks along creeks and other recharge features, limiting impervious surfaces where appropriate, and retaining natural drainage patterns within newly developing areas.
>
> **Policy CO-5.2: Improvements to Groundwater Quality** – Support efforts to improve groundwater quality, including the use of non-toxic herbicides and fertilizers, the enforcement of anti-litter laws, the clean-up of sites contaminated by toxics, and on-going monitoring by the Alameda County Flood Control and Water Conservation District.
>
> **Policy CO-5.3 Control of Urban Runoff –** Employ a broad range of strategies, compatible with the Alameda Countywide Clean Water Program, to: (a) reduce water pollution associated with stormwater runoff; (b) reduce water pollution associated with hazardous spills, runoff from hazardous material areas, improper disposal of household hazardous wastes, illicit dumping, and marina “live-aboards”; and (c) improve water

quality in Lake Merritt to enhance the lake's aesthetic, recreational, and ecological functions.

Objective CO-6: Surface Waters – To protect the ecology and promote the beneficial uses of Oakland's creeks, lakes, and nearshore waters.

Policy CO-6.1: Creek Management – Protect Oakland's remaining natural creek segments by retaining creek vegetation, maintaining creek setbacks, and controlling bank erosion. Design future flood control projects to preserve the natural character of creeks and incorporate provisions for public access, including trails, where feasible. Strongly discourage projects which bury creeks or divert them into concrete channels.

City of Oakland Creek Protection Ordinance

The purpose and intent of the City of Oakland's Creek Protection Ordinance (Oakland Municipal Code Chapter 13.16) is as follows:

- Safeguarding and preserving creeks and riparian corridors in a natural state;
- Preserving and enhancing creekside vegetation and wildlife;
- Preventing activities that would contribute significantly to flooding, erosion or sedimentation, or that would destroy riparian areas or would inhibit their restoration;
- Enhancing recreational and beneficial uses of creeks;
- Controlling erosion and sedimentation;
- Protecting drainage facilities; and
- Protecting the public health and safety, and public and private property.

The ordinance includes permitting guidelines for development and construction projects taking place in or near creeks. This includes the clearing of vegetation for wildfire hazard reduction purposes. Vegetation management activities on any creekside property would require a Creek Protection Permit. Creekside properties are defined as properties located within Oakland, as identified by the Watershed Programs Manager, which have a creek or riparian corridor crossing the property and/or are contiguous to a creek or riparian corridor. Creekside properties within the VMP area are shown on Figure 3.4-2 in Section 3.4, "Biological Resources." The intent of the ordinance is to assure that any work done will avoid or limit, to the extent feasible, negative impacts to creeks. The primary measure to minimize impacts to creeks and other water courses in the VMP area is avoidance of work in the vicinity of these features. For vegetation management activities conducted within creekside properties, OFD shall obtain a Creek Protection Permit, as outlined in Oakland Municipal Code Chapter 13.16. A Creek Protection Plan is required for a Creek Protection Permit when the work falls within Categories III and IV as defined in Oakland Municipal Code Section 13.16.130, and the Creek Protection Plan includes BMPs to protect the creek. Category III includes work that may adversely impact the creek, beyond the 20-foot setback from the top of bank of the creek, and is within 100 feet of the centerline of the creek. Category IV includes work that is conducted from the centerline of the creek to the 20-foot setback from the top of bank of the creek.

North Oakland Hill Area Specific Plan

The North Oakland Hill Area Specific Plan (City of Oakland 1986) is a document addressing land use, infrastructure, zoning, and development in a portion of the Oakland hills. The area covered by this specific plan is generally located along the ridgeline northwest of Shepherd Canyon Road. This specific plan includes a vegetation management prescription and specific policies and mitigation measures to reduce erosion and sedimentation within the North Oakland hill area. The approach and goals addressed by these policies and mitigation measures have, in many cases, been incorporated into the City's General Plan and elements of the Draft VMP.

3.9.3 Impact Analysis

Methodology

Potential short-term and long-term impacts to hydrology and water quality were assessed qualitatively, based on the degree to which the VMP activities could result in violations of water quality standards, impairment of beneficial uses, or water quality conditions that could be harmful to aquatic life or human health. Each of these potential impacts is discussed below.

Criteria for Determining Significance

Based on Appendix G of the CEQA Guidelines and the City of Oakland CEQA Thresholds of Significance, it was determined that the VMP would result in a significant impact on hydrology and water quality if it would:

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

- Risk release of pollutants due to project inundation should the project be located in a flood hazard, tsunami, or seiche zone(s);

- Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan;

- Otherwise substantially degrade water quality;

- Place housing within a 100-year flood hazard area, as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map, that would impede or redirect flood flows;

- Place within a 100-year flood hazard area structures which would impede or redirect flood flows;

- Expose people or structures to a substantial risk of loss, injury, or death involving flooding;

- Expose people or structures to a substantial risk of loss, injury, or death as a result of inundation by seiche, tsunami, or mudflow; or

- Fundamentally conflict with the City of Oakland Creek Protection Ordinance (OMC Chapter 13.16) intended to protect hydrologic resources. [Note: Although there are no specific, numeric/quantitative criteria to assess impacts, factors to be considered in determining significance include whether there is substantial degradation of water quality through (a) discharging a substantial amount of pollutants into a creek, (b) significantly modifying the natural flow of the water or capacity, (c) depositing substantial amounts of new material into a creek or causing substantial bank erosion or instability, or (d) substantially endangering public or private property or threatening public health or safety.]

Issues Not Evaluated Further

Due to the nature of the VMP, there would be no impacts related to the following significance criteria:

- **Place housing within a 100-year flood hazard area, as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map, that would impede or redirect flood flows; or place within a 100-year flood hazard area structures which would impede or redirect flood flows.** The VMP does not propose construction of housing or other structures, or development within a 100-year flood hazard area.

- **Expose people or structures to a substantial risk of loss, injury, or death as a result of inundation by seiche or tsunami.** The VMP does not propose work or construction in areas at risk of seiches or tsunamis.

Environmental Impacts

Impact HYD/WQ-1: Violate Water Quality Standards or Waste Discharge Requirements or Otherwise Substantially Degrade Water Quality or Conflict with or Obstruct the Implementation of a Water Quality Control Plan or Conflict with the City of Oakland Creek Protection Ordinance through Hand Labor, Herbicide Application, or Mechanical Techniques (*Less than Significant with Mitigation*)

Hand labor and mechanical techniques have the potential to loosen and disturb soils or expose soil through removal of surface litter. Without adequate protection measures in place, such activities could lead to temporary effects on water quality in nearby waterways due to erosion, sedimentation, and siltation. The City would minimize vegetation management within 100 feet of streams, but some vegetation management would still be needed near creeks to reduce fire hazard. A Creek Protection Permit would be required for any projects in creekside parcels. See Table 3.4-4 in Section 3.4, "Biological Resources," for a list of VMP priority projects within creekside parcels. The use of herbicides has the potential to affect water quality through transportation through the air and in runoff (the VMP does not include any direct herbicide treatment within creek corridors or aquatic waterways). Leaks and spills associated with the operation and maintenance of motorized equipment present another potential risk to water quality.

Implementation of the following mitigation measures would reduce the VMP's potential for impacts to water quality. Implementation of **Mitigation Measure HYD/WQ-1 (Work Windows)** would limit vegetation treatment to periods without significant rainfall, limit herbicide use to the dry season, and limit work in waterbodies. Implementation of **Mitigation Measure GEO-1 (Minimize Soil Disturbance)** would limit ground disturbance to the minimum footprint necessary to meet objects, leave stumps intact, and minimize heavy equipment use on steep slopes. Implementation of **Mitigation Measure GEO-2 (Erosion and Sediment Control Measures)** would require the use of erosion and sediment controls. Implementation of **Mitigation Measure HAZ-1 (Vehicle and Equipment Maintenance), Mitigation Measure HAZ-2 (Vehicle and Equipment Fueling), Mitigation Measure HAZ-3 (On-Site Hazardous Materials Management)**, **Mitigation Measure HAZ-5 (Standard Herbicide Use Requirements), Mitigation Measure HAZ-6 (Spill Prevention and Response), and Mitigation Measure HAZ-8 (Existing Hazardous Materials),** would ensuring proper handling and use of herbicides and other hazardous materials, and maintaining vehicles to prevent spills and leaks.

Mitigation Measures

Mitigation Measure HYD/WQ-1: Work Windows (VMP BMP GEN-1)

The City and its contractors shall implement the following measures:

- Hand pruning and hand removal of vegetation may occur year-round, except when wheeled or tracked equipment needs to access a site by crossing a creek, ponded area, or secondary channel.

- When wheeled or tracked equipment needs to access the site by crossing a creek, ponded area, or secondary channel, this shall occur only when the appropriate permits have been obtained from the City, CDFW, and the RWQCB and only when there is no flow in the creek, or when the width of the wet creek is less than 3 feet (typically June 1 – October 15).

- Vegetation treatment shall not occur within 48 hours of significant rainfall (0.25-inch of rain within a 12-hour period or greater).

- Herbicide applications (if selected as a vegetation management technique) shall only occur between June 15 and November 15, with an extension through December 31 or until the first occurrence of local rainfall greater than 0.5 inch is forecasted within a 24-hour period following planned application events.

- Work shall occur during daylight hours, except in the case of emergency.

Mitigation Measure GEO-1: Minimize Soil Disturbance (VMP BMP GEN-2)

See text in Section 3.6, "Geology, Soils, and Seismicity."

Mitigation Measure GEO-2: Erosion and Sediment Control Measures (VMP BMP GEN-3)

See text in Section 3.6, "Geology, Soils, and Seismicity."

Mitigation Measure HAZ-1: Vehicle and Equipment Maintenance (VMP BMP GEN-8)

See text in Section 3.8, "Hazards and Hazardous Materials."

Mitigation Measure HAZ-2: Vehicle and Equipment Fueling (VMP BMP GEN-9)

See text in Section 3.8, "Hazards and Hazardous Materials."

Mitigation Measure HAZ-3: On-Site Hazardous Materials Management (VMP BMP GEN-5)

See text in Section 3.8, "Hazards and Hazardous Materials."

Mitigation Measure HAZ-5: Standard Herbicide Use Requirements (VMP BMP VEG-2)

See text in Section 3.8, "Hazards and Hazardous Materialsv."

Mitigation Measure HAZ-6: Spill Prevention and Response (VMP BMP GEN-7)

See text in Section 3.8, "Hazards and Hazardous Materials."

Mitigation Measure HAZ-8: Existing Hazardous Materials (VMP BMP GEN-6)

See text in Section 3.8, "Hazards and Hazardous Materials."

Conclusion

Hand labor and mechanical techniques have the potential to loosen, disturb, and expose soils which could result in erosion, sedimentation, and siltation. Herbicide application has the

potential to affect water quality through transportation in air or runoff. The use of motorized equipment presents another potential risk to water quality in the form of leaks and spills.

With implementation of Mitigation Measures HYD/WQ-1, GEO-1, GEO-2, HAZ-1, HAZ-2, HAZ-3, HAZ-5, HAZ-6, and HAZ-8, the VMP would not conflict with the Basin Plan, the City of Oakland's General Plan, or the City of Oakland's Creek Protection Ordinance. Therefore, impacts on water quality would be **less than significant with mitigation.**

Impact HYD/WQ-2: Violate Water Quality Standards or Waste Discharge Requirement or Otherwise Substantially Degrade Water Quality or Conflict with or Obstruct the Implementation of a Water Quality Control Plan or Conflict with the City of Oakland Creek Protection Ordinance through Grazing (*Less than Significant with Mitigation*)

Grazing activities have the potential to denude vegetation, compact soils, and create livestock trails and areas of bare soil which could result in gullies and erosional features that impact water quality. Grazing animals could congregate near water sources and degrade water quality through the accumulation of manure and urine.

Implementation of **Mitigation Measure BIO-5 (Grazing)** would reduce the VMP's potential for impacts to water quality by erosion impacts from grazing by monitoring livestock and rotating grazing areas to ensure over-grazing does not occur, generally excluding livestock from riparian areas, and requiring contractors to provide alternative water sources to avoid livestock concentration and reliance on natural water sources. Implementation of Mitigation Measure GEO-1 (Minimize Soil Disturbance) would limit ground disturbance to the minimum footprint necessary to meet objects, leave stumps intact, and minimize heavy equipment use on steep slopes. Implementation of Mitigation Measure GEO-2 (Erosion and Sediment Control Measures) would require the use of erosion and sediment controls.

Mitigation Measures

Mitigation Measure BIO-5: Grazing (VMP BMP BIO-6)

See text in Section 3.4, "Biological Resources."

Mitigation Measure GEO-1: Minimize Soil Disturbance (VMP BMP GEN-2)

See text in Section 3.6, "Geology, Soils, and Seismicity."

Mitigation Measure GEO-2: Erosion and Sediment Control Measures (VMP BMP GEN-3)

See text in Section 3.6, "Geology, Soils, and Seismicity."

Conclusion

Grazing livestock may denude vegetation, create livestock trails and areas of bare soil, and degrade water sources with their waste. With the implementation of Mitigation Measure BIO-5, which would protect riparian areas and prevent over-grazing, and Mitigation Measures GEO-1

and GEO-2, which would minimize soil disturbance and protect waterways from erosion and sedimentation, this impact would be **less than significant with mitigation**.

Impact HYD/WQ-3: Substantially Alter Existing Drainage Pattern of Site or Area, or Create or Contribute Runoff Water that Exceeds Capacity of Stormwater Systems, or Results in Substantial Erosion or Exposes People or Structures to a Substantial Risk of Loss, Injury, or Death as a Result of Flooding or Inundation by Mudflow (*Less than Significant with Mitigation*)

Implementation of the VMP would involve the use of hand tools, mechanical equipment, herbicide application, and grazing to manage vegetation and reduce fire risks. Leaving large cut trees on the ground and the creation of livestock trails could potentially alter site drainage patterns. As described in Section 2.3.3, "Vegetation Management Standards," of Chapter 2, *Project* Description*,* tree trunks that would be removed, would be chipped and spread on-site and stumps from some trees will be left in the ground to minimize erosion. While VMP activities could decrease the interception of precipitation by trees, shrubs, and grasses, any impact on surface runoff flows, flooding, and mudflow risk would be minimal. As discussed in Impacts HYD/WQ-1 and HYD/WQ-2, these activities have the potential to loosen soil or create areas of bare soil that would be susceptible to erosion.

Implementation of Mitigation Measures BIO-5, GEO-1, GEO-2, HAZ-1, HAZ-2, HAZ-3, HAZ-5, HAZ-6, HAZ-8, and HYD/WQ-1 would reduce the VMP's potential for resulting in substantial erosion and altering existing drainage patterns and runoff flows. Therefore, this impact would be **less than significant with mitigation**.

Mitigation Measures

Mitigation Measure BIO-5: Grazing (revised from VMP BMP BIO-6)

See text in Section 3.4, "Biological Resources."

Mitigation Measure GEO-1: Minimize Soil Disturbance (VMP BMP GEN-2)

See text in Section 3.6, "Geology, Soils, and Seismicity."

Mitigation Measure GEO-2: Erosion and Sediment Control Measures (VMP BMP GEN-3)

See text in Section 3.6, "Geology, Soils, and Seismicity."

Mitigation Measure HAZ-1: Vehicle and Equipment Maintenance (VMP BMP GEN-8)

See text in Section 3.8, "Hazards and Hazardous Materials."

Mitigation Measure HAZ-2: Vehicle and Equipment Fueling (VMP BMP GEN-9)

See text in Section 3.8, "Hazards and Hazardous Materials."

Mitigation Measure HAZ-3: On-Site Hazardous Materials Management (VMP BMP GEN-5)

See text in Section 3.8, "Hazards and Hazardous Materials."

Mitigation Measure HAZ-5: Standard Herbicide Use Requirements (VMP BMP VEG-2)

See text in Section 3.8, "Hazards and Hazardous Materials."

Mitigation Measure HAZ-6: Spill Prevention and Response (VMP BMP GEN-7)

See text in Section 3.8, "Hazards and Hazardous Materials."

Mitigation Measure HAZ-8: Existing Hazardous Materials (VMP BMP GEN-6)

See text in Section 3.8, "Hazards and Hazardous Materials."

Mitigation Measure HYD/WQ-1: Work Windows (VMP BMP GEN-1)

See text in Impact HYD/WQ-1 above.

Conclusion

While VMP activities have potential for substantial erosion and altering of site drainage patterns and runoff flows, implementation of Mitigation Measures BIO-5, GEO-1, GEO-2, HAZ-1, HAZ-2, HAZ-3, HAZ-5, HAZ-6, HAZ-8, and HYD/WQ-1 would reduce the VMP's effect to **less than significant with mitigation**.

Impact HYD/WQ-4: Substantially Decrease Groundwater Supplies or Interfere with Groundwater Recharge Such That There Would Be a Net Deficit in Aquifer Volume or a Lowering of the Local Groundwater Table Level *(Less than Significant)*

VMP activities would include the use of hand tools, motorized equipment, herbicide application, and grazing to manage vegetation and reduce fire risks. Taking into account the BMPs included in the VMP (refer to **Appendix A**, *Draft Vegetation Management Plan,* of this DEIR), in some areas, the removal of vegetation and plant debris would result in greater groundwater recharge due to decreased interception, uptake, and evapotranspiration. While a decrease in shade from removed vegetation could increase soil temperatures and surface water loss from evaporation, chipping and mulching would limit soil moisture declines. In some cases, soils present in portions of the VMP area may experience minor surficial ground compaction due to vegetation removal activities. Such soil compaction could reduce precipitation infiltration potential in these areas. However, the application of chipping and mulching would offset this effect by enhancing infiltration capacity. Reductions in infiltration and deeper groundwater percolation are not anticipated due to vegetation management practices. Additionally, the VMP does not propose use of groundwater supplies or the creation of impervious surfaces that could interfere with groundwater recharge. Therefore, this impact would be **less than significant** and no mitigation is required.

3.10 NOISE AND VIBRATION

This section describes the existing noise environment in the vicinity of the VMP area, presents relevant noise and vibration regulations, identifies sensitive noise and vibration receptors that could be affected by the VMP, and evaluates the noise and vibration impacts of the VMP. Mitigation measures are prescribed to reduce significant noise and vibration impacts. Technical information used in preparing this section is provided in **Appendix F**, *Noise and Vibration*, of this DEIR.

3.10.1 Environmental Setting

Study Area

For the purposes of this noise and vibration analysis, the study area is defined as the area within 100 feet of the VMP treatment areas.

Noise Principles and Descriptors

Noise Background

In the CEQA context, noise can be defined as unwanted sound. Sound is characterized by various parameters, including the rate of oscillation of sound waves (frequency), the speed of propagation, and the pressure level or energy content (amplitude). In particular, the sound pressure level is the most common descriptor used to characterize the loudness of an ambient sound level, or sound intensity. The decibel (dB) scale is used to quantify sound intensity. Because sound pressure can vary enormously within the range of human hearing, a logarithmic scale is used to keep sound intensity numbers at a convenient and manageable level. The human ear is not equally sensitive to all frequencies in the spectrum, so noise measurements are weighted more heavily for frequencies to which humans are sensitive, creating the A-weighted decibel (dBA) scale.

Different types of measurements are used to characterize the time-varying nature of sound. Below are brief definitions of these measurements and other terminology used in this chapter.

- **Decibel (dB)** is a measure of sound on a logarithmic scale that indicates the squared ratio of sound pressure amplitude to a reference sound pressure amplitude.
- **A-weighted decibel (dBA)** is an overall frequency-weighted sound level in decibels that approximates the frequency response of the human ear.
- **Maximum sound level (L_{max})** is the maximum sound level measured during a given measurement period.
- **Minimum sound level (L_{min})** is the minimum sound level measured during a given measurement period.

- **Equivalent sound level (L_{eq})** is the equivalent steady-state sound level that, in a given period, would contain the same acoustical energy as a time-varying sound level during that same period.

- **Day-night sound level (L_{dn})** is the energy average of the A-weighted sound levels occurring during a 24-hour period, with 10 dB added to the A-weighted sound levels during the period from 10:00 p.m. to 7:00 a.m. (typical sleeping hours). This weighting adjustment reflects the elevated sensitivity of individuals to ambient sound during nighttime hours.

- **Community noise equivalent level (CNEL)** is the energy average of the A-weighted sound levels during a 24-hour period, with 5 dB added to the A-weighted sound levels between 7:00 p.m. and 10:00 p.m. and 10 dB added to the A-weighted sound levels between 10:00 p.m. and 7:00 a.m.

In general, human sound perception is such that a change in sound level of 3 dB is barely noticeable, a change of 5 dB is clearly noticeable, and a change of 10 dB is perceived as doubling or halving the sound level. **Table 3.10-1** presents approximate noise levels for common noise sources, measured adjacent to the source.

Table 3.10-1. Examples of Common Noise Levels

Common Outdoor Activities	Noise Level (dBA)
Jet flyover at 1,000 feet	110
Gas lawnmower at 3 feet	100
Diesel truck at 50 feet traveling 50 miles per hour	90
Noisy urban area, daytime	80
Gas lawnmower at 100 feet, commercial area	70
Heavy traffic at 300 feet	60
Quiet urban area, daytime	50
Quiet urban area, nighttime	40
Quiet suburban area, nighttime	30
Quiet rural area, nighttime	20

Notes: Caltrans = California Department of Transportation; dBA = A-weighted decibel.

Source: Caltrans 2013a, 2013b

Vibration Background

Groundborne vibration propagates from the source through the ground to adjacent buildings by surface waves. Vibration may be composed of a single pulse, a series of pulses, or a continuous oscillatory motion. The frequency of a vibrating object describes how rapidly it is oscillating, measured in Hertz (Hz). Most environmental vibrations consist of a composite, or "spectrum," of many frequencies. The normal frequency range of most groundborne vibrations that can be felt generally starts from a low frequency of less than 1 Hz to a high of about 200 Hz. Vibration information for this analysis has been described in terms of the peak particle velocity (PPV),

measured in inches per second, or of the vibration level measured with respect to root-mean-square vibration velocity in decibels (VdB), with a reference quantity of 1 micro-inch per second.

Vibration energy dissipates as it travels through the ground, causing the vibration amplitude to decrease with distance away from the source. High-frequency vibrations attenuate much more rapidly than do those characterized by low frequencies, so that in a far-field zone distant from a source, the vibrations with lower frequency amplitudes tend to dominate. Soil properties also affect the propagation of vibration. When groundborne vibration interacts with a building, a ground-to-foundation coupling loss usually results but the vibration also can be amplified by the structural resonances of the walls and floors. Vibration in buildings is typically perceived as rattling of windows, shaking of loose items, or the motion of building surfaces. In some cases, the vibration of building surfaces also can be radiated as sound and heard as a low-frequency rumbling noise, known as groundborne noise.

Groundborne vibration is generally limited to areas within a few hundred feet of certain types of industrial operations and construction/demolition activities, such as pile driving. Road vehicles rarely create enough groundborne vibration amplitude to be perceptible to humans unless the receiver is in immediate proximity to the source or the road surface is poorly maintained and has potholes or bumps. Human sensitivity to vibration varies by frequency and by receiver. Generally, people are more sensitive to low-frequency vibration. Human annoyance also is related to the number and duration of events; the more events or the greater the duration, the more annoying it becomes.

Existing Noise Environment

The major noise sources in Oakland are transportation-related including vehicle traffic on highways and major roads, rail operations including Bay Area Rapid Transit (BART), and aircraft operations at Oakland International Airport (City of Oakland 2005). In the vicinity of the VMP area, the primary sources of noise are Interstate 580, Highway 13, and BART. Many VMP parcels are in or adjacent to parks and single-family residential areas, where common noise sources include equipment used for landscaping and yardwork such as lawnmowers. Similarly, many VMP areas are open spaces or recreational areas that generally have less ambient noise, and no permanent or substantial onsite noise sources. On-site uses in some parks such as Oakland Zoo, Chabot Science Center, sport fields, or amphitheaters constitute additional potential noise source in the VMP area. The City of Oakland Noise Element Update Environmental Noise Background Report (2004) includes noise level information for multiple sites in the vicinity of the VMP area (**Table 3.10-2** and **Table 3.10-3**).

Table 3.10-2. Measured Long-term Noise Levels in VMP Vicinity

Site	Location	Date	Measured Noise Levels		
			Daytime Noise Levels	Nighttime Noise Levels	L_{dn}
LT-2	~20 ft from the centerline of Skyline Pkwy at 7293 Skyline Parkway	8/17/04 to 8/19/04	55 to 68	32 to 58	61-63
LT-4	~87 ft from the centerline of Skyline Parkway at Mott Place	8/17/04 to 8/19/04	52 to 61	42 to 55	57-58

Table 3.10-3. Measured Short-term Noise Levels in VMP Vicinity

Site	Location	Date	Measured Noise Levels		
			L_{max}	L_{min}	L_{eq}
ST-3	At the intersection of Grand View and Gravatt	8/18/2004 11:40 AM	66	39	53
ST-6	~63 ft from the centerline of Shepard Canyon Road at Paso Robles	8/18/2004 2:00 PM	77	41	59
ST-11	~71 ft from the centerline of Golf Links Rd at Dunkirk Ave	8/24/2004 12:40 PM	73	39	58

Sensitive Receptors

According to the City of Oakland's General Plan, sensitive receptors include residences, schools, churches, hospitals, elderly care facilities, hotels, libraries, and certain types of passive recreational open space[8] (City of Oakland 2005). As stated above under Existing Noise Environment, VMP project sites are generally located in the Oakland Hills and border residential areas and open spaces. **Table 3.10-4** includes information on the sensitive receptors closest to the major VMP Treatment Project areas. Smaller parcels, which are not included in the table, often include, or are adjacent to, single-family residences.

[8] Passive recreational areas tend to be largely undeveloped and have no specific designated uses. Passive recreational activities, such as walking, bird watching, and picnicking can be negatively impacted by noise.

Table 3.10-4. Sensitive Receptors Near VMP Treatment Areas

VMP Treatment Project	Sensitive Receptor	Distance in Feet to Nearest Receptor from Project Area (center/edge)
Garber Park	Multiple Residences along Alvarado Road, Evergreen Lane, Siler Place, and Rispin Drive	215 / 0
	Claremont Hotel	1,600 / 600
Grizzly Peak Open Space	Multiple Residences along Tunnel Road, Bay Forest Drive, Buckingham Boulevard, and Westmoorland Drive	290 / 0
North Oakland Sports Field	Residences along Gwin Road, Fairlane Drive, Swainland Road, and Skyline Boulevard	1,100 / 300
Skyline Boulevard	Multiple Single-Family Residences along Skyline Boulevard	30 (from road center) / 0
Shepherd Canyon	Shepherd Canyon Park, Shepherd Canyon Trail, and Montclair Park	0 / 0
	Single-Family Residences along Magellan Drive, Cortereal Avenue, Snake Road, Drake Drive, Zinn Drive, Cortez Court, Bishop Court, Westover Drive, Pelham Place, Scarborough Drive	425 / 0
	First Church of Christ Scientist	2,800 / 350
Dimond Canyon Park	Single-Family Residences along Leimert Boulevard, Monterey Boulevard, Bridgeview Drive, Arden Place, Clemens Road, Oakmore Road, Park Boulevard, Hanly Road, El Centro Avenue, Lyman Road, Canon Avenue, Vista Street	220 / 0
	The Renaissance International School, Corpus Christi School, Glenview Elementary School	415 / 100
	Dimond Branch Oakland Public Library	4,000 / 670
	Zion Lutheran Church, Corpus Christi Church	415 / 85
Joaquin Miller Park	Residences along Joaquin Miller Road, Burdeck Court, Butters Drive, Robinson Drive, Skyline Boulevard, Castle Drive, Waybridge Court, Castle Park Way, Mastlands Drive, Joaquin Miller Court, Woodcrest Circle	1,500 / 0
	Joaquin Miller Park, Chabot Space and Science Center	0 / 0
	A Child's House – Preschool	1,800 / 150
	Church of Jesus Christ of LDS	4,500 / 1,200

VMP Treatment Project	Sensitive Receptor	Distance in Feet to Nearest Receptor from Project Area (center/edge)
Leona Heights Park	Residences along Redwood Road, Geranium Place, Berneves Court, Mountain Boulevard	280 / 0
	East Hills Community Church	1,700 / 330
	Mountain Boulevard Montessori School, Chatham Nursery School, Carl B Munck Elementary School, Merritt College	640 / 5
	Sunrise of Oakland Hills (Assisted Living Facility)	2,100 / 1,350
King Estate Open Space Park	Residences along Greenly Drive, Sterling Drive, McCormick Avenue, Sunkist Drive, 82nd Avenue, El Monte Avenue, Aster Avenue, Ney Avenue, Fontaine Street, Blandon Road, Sarazen Avenue, Castlewood Street, Calandria Avenue, Murillo Avenue, Crest Avenue	550 / 0
	Sojourner Truth School, Charles P. Howard Elementary School	410 / 0
	Bethany Home Care, E.E. Cleveland Manor (Assisted Living Facilities)	2,400 / 750
	United Lutheran Church of Oakland, Center of Hope Community Church, Masjid Al-Islam	1,040 / 10
Knowland Park	Residences along Golf Links Road, Anza Avenue, Burgos Avenue, Sigourney Avenue, Orinda Vista Drive, Royal Oak Road, Elysian Fields Drive, Riviera Court, Pebble Beach Drive, Fox Hills Court, Scotia Avenue, Merlin Court, Cotter Street, Key Court, Caloden Lane, Fallbrook Way, Malcolm Avenue, Elvessa Street, Ettrick Street, Lochard Street, Cameron Avenue, Snowdown Avenue, Edgemont Way, Maggiora Drive, Hellman Street, Stella Street, Mark Street, Hood Street, 106th Avenue, Sheldon Street, Broadmoor View, Stanley Avenue	920 / 0
	St. Paschal Baylon Catholic Church, Northern Light School, Grass Valley Elementary School, BJ's Daycare Center	2,800 / 210
	Oakland Zoo, Knowland Park	0 / 0
	Sunny Care Home, Bethany Home Care, D'Nalor Care Homes (Assisted Living Facilities)	3,535 / 120
	Harris Motel, Commodore Hotel, Premier Inn & Suites, Starlite Motel, Welcome Inn, Crown Lodge Motel, Travis Lodge Motel 16	5,800 / 1,350

VMP Treatment Project	Sensitive Receptor	Distance in Feet to Nearest Receptor from Project Area (center/edge)
Lake Chabot Golf Course	Residences along Sun Valley Drive, Golf Links Road, Turner Avenue, Lochard Street	1,200 / 10
	East Bay Bible Church	2,650 / 1,325
	Sheffield Village Open Space	1,100 / 0
Sheffield Village Open Space	Residences along Cranford Way, Revere Avenue, Marlow Drive, Malcolm Avenue, Broadmoor View, Daniels Drive, Sylvan Circle, Lochard Street	725 / 0
	East Bay Innovation Academy	3,650 / 10
	Fairhaven Bible Chapel, Creekside Community Church	2,580 / 650
	Dunsmuir Hellen Historic Estate, Lake Chabot Golf Course	1,100 / 0
	D'Nalor Care Homes	5,550 / 1,890

3.10.2 Regulatory Setting

Federal Laws, Regulations, and Policies

No federal laws, regulations, or policies for construction-related noise and vibration apply to the VMP. However, the Federal Transit Administration (FTA) *Guidelines for Construction Vibration in Transit Noise and Vibration Impact Assessment* state that, for evaluating daytime construction noise impacts in outdoor areas, a noise threshold of 90 dBA L_{eq} and 100 dBA L_{eq} should be used for residential and commercial/industrial areas, respectively (FTA 2018).

For construction vibration impacts, the FTA guidelines use an annoyance threshold of 80 VdB for infrequent events (fewer than 30 vibration events per day) and a damage threshold of 0.12 inch per second (in/sec) PPV for buildings susceptible to vibration damage (FTA 2018).

State Laws, Regulations, and Policies

California requires each local government entity to implement a noise element as part of its general plan. California Administrative Code, Title 4, presents guidelines for evaluating the compatibility of various land uses as a function of community noise exposure. The state land use compatibility guidelines are listed in **Table 3.10-5**.

Local Laws, Regulations, and Policies

City of Oakland General Plan

The City of Oakland General Plan Noise Element contains the following goals and policies that may be relevant to the VMP (City of Oakland 2005):

Goal: To protect Oakland's quality of life and the physical and mental well-being of residents and others in the City by reducing the community's exposure to noise

> **Policy 2:** Protect the noise environment by controlling the generation of noise by both stationary and mobile noise sources.
>
> Land use compatibility noise standards are listed in Figure 6 of the General Plan Noise Element, which include:
>
> - Normally acceptable noise standard of 60 dB Ldn or CNEL for residential land uses.
> - Normally acceptable noise standard of 65 dB Ldn or CNEL for neighborhood parks.

Table 3.10-5. State Land Use Compatibility Standards for Community Noise Environment

Land Use Category	Community Noise Exposure - L_{dn} or CNEL (dB)						
	55	60	65	70	75	80	
Residential – Low Density Single Family, Duplex, Mobile Homes							
Residential – Multi-Family							
Transient Lodging – Motels, Hotels							
Schools, Libraries, Churches, Hospitals, Nursing Homes							
Auditoriums, Concert Halls, Amphitheaters							
Sports Arenas, Outdoor Spectator Sports							
Playgrounds, Neighborhood Parks							
Golf Courses, Riding Stables, Water Recreation, Cemeteries							
Office Buildings, Business Commercial and Professional							
Industrial, Manufacturing, Utilities, Agriculture							

Normally Acceptable	Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.
Conditionally Acceptable	New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features are included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice.
Normally Unacceptable	New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.
Clearly Unacceptable	New construction or development generally should not be undertaken.

Notes: CNEL = community noise equivalent level; dB = decibel; L_{dn} = day-night sound level.

Source: California Governor's Office of Planning and Research 2017

City of Oakland Noise Ordinance

The City of Oakland Noise Ordinance contains the following laws and standards that may be relevant to the VMP (City of Oakland 2020a):

8.18.010 – Excessive and annoying noises prohibited.

A. It is unlawful for any person to create or allow to be created any excessive or annoying noise as defined herein. Any violation of the regulations specified herein shall be punishable as an infraction.

B. Definitions.

"Annoying noise" means noise with a repetitive pattern, shrill frequencies, and/or static-like sounds, including loud music and noise attributable to, but not limited to, leaf blowers, alarms, engines, barking dogs, and other animals.

"Excessive noise" means any unnecessary noise which persists for ten minutes or more; such period of noise need not be witnessed by enforcement personnel if the occupants of two or more separate housing or commercial units certify that they have experienced such period of noise and describe with particularity the source.

C. Excessive and Annoying Noises a Nuisance. The following acts, and the causing or permitting thereof, shall be considered disturbing the peace and shall constitute an infraction.

9. Domestic Power Tools, Machinery. Operating or permitting the operation of any mechanically powered saw, sander, drill, grinder, lawn or garden tool, or similar tool between nine p.m. and six a.m. so as to create a noise disturbance across a real property line or at any time to violate the applicable noise provisions of the Oakland Planning Code

10. Sensitive Uses. Creation of any noise within or adjacent to a hospital or medical care facility, nursing home, school, court, day care, church, or similar facility, so as to interfere with the functions of such activity

8.18.020 – Persistent noises a nuisance. The persistent maintenance or emission of any noise or sound produced by human, animal or mechanical means, between the hours of nine p.m. and seven a.m. next ensuing, which, by reason of its raucous or nerve-racking nature, shall disturb the peace or comfort, or be injurious to the health of any person shall constitute a nuisance.

Failure to comply with the following provisions shall constitute a nuisance.

A. All construction equipment powered by internal combustion engines shall be properly muffled and maintained.

B. Unnecessary idling of internal combustion engines is prohibited.

C. All stationery noise-generating construction equipment such as tree grinders and air compressors are to be located as far as is practical from existing residences.

D. Quiet construction equipment, particularly air compressors, are to be selected whenever possible.

E. Use of pile drivers and jack hammers shall be prohibited on Sundays and holidays, except for emergencies and as approved in advance by the Building Official.

City of Oakland Planning Code

The City of Oakland Planning Code contains laws and standards that may be relevant to the VMP, in particular Section 17.120.050, Noise, and Section 17.120.060, Vibration. In addition, Section 17.120.04 from the City's Planning Code (provided in this section as **Table 3.10-6**) establishes allowable noise level standards (City of Oakland 2020b).

17.120.050 – Noise.

G. Temporary Construction or Demolition Which Exceed the Following Noise Level Standards.

1. The daytime noise level received by any Residential, Commercial, or Industrial land use which is produced by any nonscheduled, intermittent, short-term construction or demolition operation (less than ten (10) days) or by any repetitively scheduled and relatively long-term construction or demolition operation (ten (10) days or more) shall not exceed the maximum allowable receiving noise levels described in Table 17.120.04 [Table 3.10-6 of the VMP DEIR].

Table 3.10-6. Maximum Allowable Receiving Noise Level Standards*

	Daily 7 a.m. to 7 p.m.	Weekends 9 a.m. to 8 p.m.
Short-Term Operation		
Residential	80 dBA	65 dBA
Commercial, Industrial	85 dBA	70 dBA
Long-Term Operation		
Residential	65 dBA	55 dBA
Commercial, Industrial	70 dBA	60 dBA

* Receiving noise levels are measured at a position or positions at any point on the receiver's property (Section 17.150.050[F]).

Note: dBA = A-weighted decibel.

Source: Table 17.120.04 in Section 17.120.050, Noise, of the City of Oakland Planning Code (City of Oakland 2020b).

17.120.060 – Vibration. Ground vibration caused by motor vehicles, trains, and temporary construction or demolition work is exempted from this standard.

Airport Land Use Compatibility Plan

The VMP does not fall within any Airport Influence Areas or CNEL contours described in any of Alameda County's airport land use compatibility plans. At the nearest point, VMP sites are 3.3 miles east of Oakland International Airport, 4.8 miles north of Hayward Executive Airport, and more than 14 miles from both San Francisco International Airport and Livermore Municipal Airport.

3.10.3 Impact Analysis

Methodology

Noise Analysis

Noise sources from VMP treatment activities would include various pieces of heavy machinery and other noisy equipment (e.g., chippers, grinders, chainsaws). Impacts from activities that use heavy machinery and loud equipment are evaluated quantitatively in this analysis, while those that do not involve the use of these noise sources are evaluated qualitatively.

To establish an estimate of noise levels, FTA recommends that the noisiest two pieces of equipment be used to analyze the anticipated noise levels at sensitive receptors, assuming the following:

- full power operation for a full 1 hour,
- no obstructions to the noise travel paths,
- typical noise levels from construction equipment, and
- both pieces of equipment operate at the center of the work area.

Using these assumptions, the noise levels at specific distances can be obtained using the following equation:

$$L_{eq}(equip) = EL_{50ft} - 20log_{10}(D/50)$$

Where:

L_{eq} (equip) = the noise emission level at the receiver at distance D over 1 hour

EL_{50ft} = noise emission level of a particular piece of equipment at a reference distance of 50 feet

D = the distance from the receiver to the piece of equipment, in feet

To add the two noisiest pieces of equipment together, the following equation applies:

$$L_{total} = 10\ log_{10}(10^{\frac{L1}{10}} + 10^{\frac{L2}{10}})$$

Where:

L_{total} = the noise emission level of two pieces of equipment combined

L_1 = the noise emission level of equipment type 1

L_2 = the noise emission level of equipment type 2

These equations were used to compare VMP maintenance activities to the noise emission limits described in the City Planning Code. The following assumptions were used to evaluate noise effects of VMP maintenance activities:

- While the above calculations apply to VMP treatment equipment, truck traffic to and from VMP treatment sites could generate additional noise impacts for residences and commercial establishments located along haul routes.
- Using typical equipment noise emission levels from Table 9.1 of the Federal Highway Administration's (FHWA's) *Construction Noise Handbook* (FHWA 2020) and Table 3.9-3 of the Marin Municipal Water District's (MMWD's) *Draft Program Environmental Impact Report for the Biodiversity, Fire, and Fuels Integrated Plan* (MMWD 2019), the noisiest pieces of equipment used would be a chainsaw (during hand labor treatments) and an excavator and chipper (during mechanical treatments). Each of these pieces of equipment produces a similar noise level (85 dBA at 50 feet).
- Using the equations described above, the estimated distance between hand labor sites and the nearest sensitive receptors would need to be at least 89 feet to meet the City's short-term operation weekday noise level threshold of 80 dBA. For mechanical treatment sites, the estimated distance to meet this threshold would be 126 feet.
- It was assumed that most work would take no longer than 1-5 days at any one maintenance site.

Vibration Analysis

Construction activity associated with the operation of heavy equipment may generate localized groundborne vibration and noise. Vibration from ground-disturbing construction activity is typically below the threshold of perception when the activity is more than 50 feet from the receiver.

Potential vibration impacts from VMP maintenance activities were evaluated qualitatively for the following reasons:

- No pieces of equipment, such as bulldozers, vibratory rollers, and pile drivers, that are major sources of groundborne vibration would be used during VMP treatment activities.
- The City Planning Code exempts motor vehicles and temporary construction and demolition activities from the vibration standard.

Criteria for Determining Significance

Based on Appendix G of the CEQA Guidelines and the City of Oakland *CEQA Thresholds of Significance Guidelines*, the VMP would have a significant impact related to noise if it would meet any of the following conditions:

- Generate noise in violation of the City of Oakland Noise Ordinance (Oakland Planning Code section 17.120.050) regarding construction noise, except if an acoustical analysis is performed that identifies recommended measures to reduce potential impacts;
- Generate noise in violation of the City of Oakland nuisance standards (Oakland Municipal Code section 8.18.020) regarding persistent construction-related noise;
- Generate noise in violation of the City of Oakland Noise Ordinance (Oakland Planning Code section 17.120.050) regarding operational noise;
- Generate noise resulting in a 5 dBA permanent increase in ambient noise levels in the project vicinity above levels existing without the project; or, if under a cumulative scenario where the cumulative increase results in a 5 dBA permanent increase in ambient noise levels in the project vicinity without the project (i.e., the cumulative condition including the project compared to the existing conditions) and a 3 dBA permanent increase is attributable to the project (i.e., the cumulative condition including the project compared to the cumulative baseline condition without the project);
- Expose persons to interior Ldn or CNEL greater than 45 dBA for multi-family dwellings, hotels, motels, dormitories, and long-term care facilities (and may be extended by local legislative action to include single-family dwellings) per California Noise Insulation Standards (Cal. Code Regs. Part 2, Title 24);
- Expose the project to community noise in conflict with the land use compatibility guidelines of the Oakland General Plan after incorporation of all applicable Standard Conditions of Approval;
- Expose persons to or generate noise levels in excess of applicable standards established by a regulatory agency (e.g., occupational noise standards of OSHA);
- Generate a substantial temporary, periodic, or permanent increase in ambient noise levels in the vicinity of VMP treatment areas in excess of standards established in the City of Oakland General Plan or noise ordinance or in the applicable standards of other agencies;
- During either project construction or project operation expose persons to or generate groundborne vibration that exceeds the criteria established by the FTA; or
- Be located within the vicinity of a private airstrip or an airport land use plan area, or, where such a plan has not been adopted, be within 2 miles of a public airport or public-use airport, such that people residing or working in the VMP treatment area are exposed to excessive noise levels.

Issues Not Evaluated Further

Due to the nature of the VMP, there would be no impacts related to the following significance criteria for the reasons described below:

- **Generate Substantial Permanent Increase in Ambient Noise Levels.** VMP treatments would be temporary at any given location, would not involve the installation of any stationary noise sources, and therefore, would not generate a permanent increase in ambient noise levels.

- **Be Located within the Vicinity of a Private Airstrip or Airport Land Use Plan, or within 2 Miles of an Airport Such that People Working or Residing in the VMP Treatment Area Are Exposed to Excessive Noise Levels.** The VMP area does not fall within any Airport Influence Areas or CNEL contours described in any of Alameda County's airport land use compatibility plans. There are no public airports or private airstrips within 2 miles of any VMP treatment areas.

Environmental Impacts

Impact NOI-1: Generate Substantial Temporary or Periodic Increase in Ambient Noise Levels; or Generate Noise in Violation of the City of Oakland Municipal Code, in Excess of General Plan Standards, California Noise Insulation Standards, or Applicable Standards Established by a Regulatory Agency (*Significant and Unavoidable*)

Noise levels from VMP maintenance activities would be caused primarily by the various treatment activities themselves. Mechanical treatments would involve the use of motorized equipment such as excavators, chippers, masticators, and mowing equipment (see Table 2-6 in Chapter 2, *Project* Description). Hand labor treatments largely involve the use of hand tools such as chainsaws. In other instances, most of the resulting noise would be generated by trucks and vehicles transporting equipment and workers to and from the site. Grazing activities would involve noise from trucks delivering livestock, along with sounds from the animals themselves. Herbicide treatments would involve the use of backpack sprayers, which are relatively quiet.

VMP maintenance activities are operational in nature because they would be recurring throughout the VMP area over the entire period of plan approval. However, noise analysis of operational impacts typically assumes that the sound being evaluated is continuous and generated over an extended period at a given location (e.g., traffic, HVAC equipment). Analysis of construction noise levels, in contrast, assumes that the generating source is intermittent and temporary (e.g., daily use of construction equipment for a limited number of days, weeks, or months). The assumptions for construction noise more accurately explain the nature of noise levels generated by VMP maintenance activities because VMP activities would be of short duration (1-5 days) in any given area. Therefore, this analysis relies on the City's significance thresholds specified in Oakland Planning Code Section 17.120.050(G)(1) for "daytime noise levels received by any Residential, Commercial, or Industrial land use which is produced by any nonscheduled, intermittent, short-term construction or demolition operation (less than ten (10) days)."

Grazing and Herbicide Treatments

Noise from grazing activities would initially involve temporary noise from trucks delivering the livestock and, during grazing activities, sounds generated by livestock (i.e., goats). Electric fencing would be powered by small batteries and would not be anticipated to be an additional noise source during grazing activities. Livestock noise would have a minimal impact on ambient noise levels since grazing at any given location is temporary and infrequent. Grazing animals are anticipated to generate noise of about 35 dBA, a very low noise level (Weeks 2008). Herbicide application would be done using backpack sprayers and would not be a major noise source. At any given sensitive receptor, noise impacts from herbicide application and delivery of livestock to treatment areas would be brief and infrequent. Therefore, the impact from grazing and herbicide treatments would be less than significant and no mitigation is required.

Hand Labor Treatments

Hand labor treatments largely involve the use of hand tools that would not be a major source of noise. Therefore, for this treatment type, only one piece of equipment was modeled. Quantitative analysis (Appendix F) shows that chainsaws produce a noise level of 85 dBA at 50 feet and would exceed the City of Oakland's 80 dBA weekday daytime threshold at a distance of 89 feet. Due to the nature and purpose of the VMP, some hand labor treatment work would necessarily take place immediately adjacent to structures, including sensitive receptors. Therefore, the noise levels at these closest receptors (i.e., less than 90 feet from treatment locations) would exceed the City's threshold, and the impact from hand labor treatments would be potentially significant. Implementation of **Mitigation Measures NOI-1 (Limit Work Near Sensitive Receptors)** and **NOI-2 (Notify Sensitive Receptors Near Treatment Areas)** would reduce the impact by limiting the frequency and duration of chainsaw use within 90 feet of sensitive receptors and by notifying sensitive receptors at least one week prior to commencement of treatment work. However, even with these measures, the use of chainsaws would still exceed the City of Oakland's thresholds set by Section 17.120.050 at the closest sensitive receptors.

Additional mitigation measures would be required to reduce the noise levels at the closest sensitive receptors. Temporary noise barriers could be installed between sensitive receptors and treatment areas; however, hand labor treatments are short-term activities that take place over periods of a few days in any given location, and the cost and time to install barriers would be prohibitive for the brief period of use. As indicated in Section 17.120.050 of the City's Noise Ordinance, an acoustical analysis could be conducted to identify additional acoustical engineering measures to reduce noise levels; however, as with the temporary barriers, the cost and time to conduct such an analysis would be prohibitive and impractical for each specific treatment area. For these reasons, the additional measures that could further reduce the significant impact to a less-than-significant level are infeasible. The available, feasible mitigation measures will mitigate the impact, but not to a less-than-significant level. Therefore, the impact remains significant and unavoidable.

Mechanical Treatments

Mechanical treatments involve the use of motorized equipment (see Table 2-6 in Chapter 2, *Project* Description) such as excavators, chippers, masticators, and mowing equipment. The two loudest pieces of equipment (excavator and chipper) produce a combined noise level of 88 dBA

at 50 feet and exceed the City's 80 dBA weekday daytime threshold at a distance of 126 feet. Due to the nature and purpose of the VMP, mechanical treatment work would necessarily take place immediately adjacent to structures including sensitive receptors. Therefore, the impact from mechanical treatments would be significant and unavoidable. Implementation of Mitigation Measures NOI-1 and NOI-2 would reduce the impact by limiting frequency and duration of excavator and chipper use within 130 feet of sensitive receptors and by notifying sensitive receptors at least one week prior to commencement of treatment work. However, even with these measures the use of chainsaws would still exceed the City of Oakland's thresholds set by Section 17.120.050 and the measures will not mitigate the impact, but not to a less-than-significant level. Therefore, the impact remains significant and unavoidable.

Mitigation Measures

Mitigation Measure NOI-1: Limit Work Near Sensitive Receptors

To reduce noise levels below the City's 80 dBA weekday daytime threshold, in areas within 90 feet of sensitive receptors, minimize the frequency and duration of chainsaw use during hand labor treatment activities. In areas within 130 feet of sensitive receptors, minimize the use of mechanical treatments (excavator, chipper).

Mitigation Measure NOI-2: Notify Sensitive Receptors Near Treatment Areas

Notify sensitive receptors located within 150 feet of treatment areas at least one week prior to commencement of treatment work.

Conclusion

Mechanical treatment activities and the use of chainsaws during hand labor treatments have the potential to expose sensitive receptors to noise levels above the City's daytime weekday threshold of 80 dBA. Work near individual sensitive receptors would be temporary and infrequent. Implementation of Mitigation Measures NOI-1 and NOI-2 would limit the frequency and duration of noise-producing activities near sensitive receptors and provide receptors advance notification of work. While implementation of Mitigation Measures NOI-1 and NOI-2 would help minimize noise impacts, the use of noise-producing equipment in close proximity to residences and other sensitive receptors may be necessary in order to reduce fire risk at those receptors and in adjacent VMP treatment areas.

There is no additional feasible mitigation that could be implemented to decrease noise levels at receptors. The use of temporary sound barriers between construction activity and the sensitive receptors is a common construction-related noise mitigation measure. However, this strategy is not feasible to implement for VMP management activities because of the location, nature, and pace of the treatment activities. Installing temporary sound barriers in the VMP area would often be a hazard to workers, the public, and nearby structures or buildings because of the hilly, vegetated, and undeveloped terrain, and sound barriers could inhibit wildlife movement in the area. Establishing a distance from residences within which noise-generating treatments or hand-operated power tools and heavy equipment would be prohibited is another potential mitigation strategy. However, prohibiting or reducing the effectiveness of treatments near residences would prevent the City from accomplishing the primary objective of the VMP. Therefore, these potential mitigation strategies are not feasible. For the reasons described above, even with

implementation of Mitigation Measures NOI-1 and NOI-2, temporary increases in ambient noise levels at VMP treatment areas would be **significant and unavoidable.**

Impact NOI-2: Generate Groundborne Vibration or Groundborne Vibration Levels that Exceed FTA Criteria (*Less than Significant*)

VMP treatment activities would involve the use of equipment including trucks used for hauling away material or transporting equipment and livestock that may generate groundborne vibration. At any given sensitive receptor, groundborne vibration from equipment and trucks hauling away material or transporting equipment and livestock, would be limited in duration and infrequent. Section 17.120.060 of the City of Oakland Planning Code exempts motor vehicles and temporary construction and demolition activities from the vibration standard. Therefore, the generation of groundborne vibration from VMP activities would be **less than significant** and no mitigation is required.

3.11 RECREATION

This section presents an overview of recreational resources adjacent to the VMP treatment areas and elsewhere within the VMP area. This section also summarizes regulations and policies related to recreation and evaluates the potential impacts of the VMP on recreational resources.

3.11.1 Environmental Setting

The VMP area includes multiple parks and open spaces areas, as shown in Figure 2-2. **Table 3.11-1** summarizes recreational features and proposed vegetation management activities at each City park and open space area.

Table 3.11-1. Parks and Open Spaces in the VMP Area

City Parks/ Open Space	Community or Neighborhood	Recreational Features	Proposed VMP activities
Garber Park	Claremont Hills	14.3-acre wildland park with several miles of hiking trails, including a one-mile self-guided hike. Garber Park is known for its stands of big leaf maple, California buckeyes, and coast live oak woodland habitat.	Maintain vegetation along adjacent roads and near trailheads/entry points Mange vegetation within 10 feet of south and east property boundary line Remove eucalyptus trees from two locations along southern park boundary
Dimond Canyon Park	Oakmore	74.7-acre park situated along Sausal Creek connects the Dimond, Glenview, Oakmore, Montclair, and Piedmont Pines neighborhoods. The Park is known for its lush forest of oaks, buckeyes, willows, bay laurels, and redwoods. This park has approximately 3 miles of hiking trails, a public pool, and a playground.	Mange vegetation along adjacent roads and near trailheads/entry points Manage vegetation within 10 feet of property boundary line where park abuts residential structures Manage vegetation in the area between the parking lot located east of the pool and adjacent residential structures
Shepherd Canyon Park	Shepherd Canyon	57.9-acre park situated along Shepherd Creek in Shepherd Canyon with approximately 0.5 miles of hiking and biking trails in the upper portion of Sausal Creek watershed.	Manage vegetation within 100 feet of structures and within 150 feet of access gate Manage vegetation along roads Implement brush and tree thinning measures in areas exhibiting extreme fire behavior and within 300 feet of structures Manage vegetation via grazing throughout the park

City Parks/ Open Space	Community or Neighborhood	Recreational Features	Proposed VMP activities
Leona Heights Park	Leona Heights	42.3-acre park with the only old growth redwood in the East Bay. Much of this park is inaccessible due to steep terrain.	Manage vegetation within 100 feet of structures, 300 feet of ridgelines, and within the current 9-acre management area Manage vegetation along adjacent roads Implement brush and tree thinning measures in areas exhibiting extreme fire behavior and within 300 feet of structures
Beaconsfield Canyon	Piedmont Pines	4.3-acre park with 0.1 mile of multi-use trails	Manage vegetation within 100 feet of structures Implement brush and tree thinning measures in areas exhibiting extreme fire behavior and within 300 feet of structures
North Oakland Regional Sports Field	Hiller Highlands	53.6-acre property south of the Caldecott Tunnel with hiking trails and sports fields.	Manage vegetation within 30 feet of the dirt access roads, 300 feet of ridgelines, 150 feet of the access gate and within the existing managed area north of the ball fields and parking areas. Implement thinning in the eucalyptus stand Remove eucalyptus trees and other highly flammable and invasive plants from oak woodland communities

City Parks/ Open Space	Community or Neighborhood	Recreational Features	Proposed VMP activities
Grizzly Peak Open Space	Claremont Hills	64.5-acre open space area.	▪ Manage vegetation within 100 feet of structures, 300 feet of ridgelines, and 30 feet of Tunnel Road and Bay Forest Drive ▪ Implement brush and tree thinning recommendations in areas exhibit extreme fire behavior and within 300 feet of structures ▪ Remove eucalyptus tree and other highly flammable and invasive plants from oak woodlands ▪ Manage vegetation via grazing through the property
Sheffield Village Open Space	Chabot Park	455.4-acre area that includes the Lake Chabot Golf Course and historic Dunsmuir Estate.	▪ Manage vegetation within 100 feet of structures including the Dunsmuir Estates portion of the property and within 150 feet of park access gates ▪ Manage vegetation within 300 feet of structures that exhibit extreme fire behavior ▪ Manage vegetation via grazing throughout the remainder of the park

City Parks/ Open Space	Community or Neighborhood	Recreational Features	Proposed VMP activities
Knowland Park and Arboretum	Grass Valley	473.5-acre property that includes the Oakland Zoo and open space area with hiking trails.	▪ Manage vegetation within 100 feet of structures, within 150 feet of park access gates, and within 300 feet of ridgelines ▪ Manage vegetation along adjacent roads ▪ Manage vegetation within 300 feet of structures in areas that exhibit extreme fire behavior ▪ Manage vegetation within 100 feet of on-site structures in the zoo portion of the property and within 100 feet of the zoo/open space interface ▪ Manage vegetation via grazing through the park
Joaquin Miller Park	Piedmont Pines	454.9-acre park that includes hiking and biking trails, parking areas, picnic areas, the Woodminster Amphitheater, a dog park, a nursery, and several other structures (e.g., Community Center, Ranger Station, the historic Joaquin Miller house, Sequoia Lodge, Sequoia Arena, and the Metropolitan Horseman's Association Clubhouse).	▪ Manage vegetation within 100 feet of on and off-site structures, within 300 feet of ridgelines, within 150 feet of park access gates and within 30 feet of known human congregation/activity areas along Skyline Boulevard and the top of Woodside Glen Court. ▪ Manage vegetation along adjacent roads ▪ Implement brush and tree thinning measures in areas exhibiting extreme fire behavior and within 300 feet of structures ▪ Manage vegetation via grazing in flashy flue areas

City Parks/ Open Space	Community or Neighborhood	Recreational Features	Proposed VMP activities
King Estate Open Space Park	Eastmont Hills	81.3-acre open space parcel with hiking trails and known for native grasses and wildflowers.	▪ Manage vegetation within 100 feet of structures, within 150 feet of park access gates, and within 30 feet of Fontaine Street and Crest Avenue ▪ Manage vegetation via grazing through the park
Tunnel Road Open Space	Claremont Hills	4-acre open space area along Tunnel Road, west of State Route 24. Includes the Oakland Hills Fire Memorial.	▪ Manage vegetation via grazing throughout the property
Marjorie Saunders Park	Shepherd Canyon	3.6-acre park along Ascot Drive, southeast of Shepherd Park.	▪ Manage vegetation within 100 feet of structures ▪ Implement brush and tree thinning recommendations in areas exhibiting extreme fire behavior and within 300 feet of structures
Oak Knoll	Oak Knoll	15.7-acre property northeast of Mountain Boulevard and south of Keller Avenue.	▪ Manage vegetation within 100 feet of structures ▪ Manage vegetation via grazing through the park
Blue Rock Court	Caballo Hills	15.4-acre area located north of I-580, northwest of Blue Rock Court.	▪ Manage vegetation within 100 feet of structures and within 30 feet of fire access road along southern property edge ▪ Implement brush and tree thinning recommendations in areas exhibiting extreme fire behavior and within 300 feet of structures ▪ Implement thinning recommendations in the property's eucalyptus stand

City Parks/ Open Space	Community or Neighborhood	Recreational Features	Proposed VMP activities
City Stables	Caballo Hills	7.4-acre property located along Skyline Boulevard that offers activities for inner-city youth including horseback riding, arts and crafts, and sustainable agriculture.	This property is currently leased to a private contractor who is responsible for vegetation management activities.
Leona Street	Leona Heights	1.9-acre open space area that is a road extension at the east end of Leona Street.	▪ Manage vegetation within 100 feet of structures
McDonnel Avenue	Leona Heights	1.1-acre open space area that is the road extension at the east end of McDonnel Avenue	▪ Manage vegetation within 100 feet of structures

3.11.2 Regulatory Setting

No federal, state, or regional laws or regulations apply to recreational resources within the VMP area.

Local Laws, Regulations, and Policies

City of Oakland General Plan – Open Space, Conservation, and Recreation Element, Open Space Chapter

Applicable goals, objectives, and policies from the City of Oakland General Plan (City of Oakland 1996) Open Space, Conservation, and Recreation Element, Open Space Chapter that are relevant to the VMP include the following:

- **Objective OS-1:** To conserve and appropriately manage undeveloped areas in Oakland which have high natural resource value, scenic value, or natural hazards which preclude safe development.
    - **Policy OS-1.1:** Conserve existing City and Regional Parks characterized by steep slopes, large groundwater recharge areas, native plant and animal communities, extreme fire hazards, or similar conditions. These areas are included in Figure 4 as Potential Resource Conservation Areas. Manage such areas to protect public health and safety and conserve natural resources.
    - **Objective OS-2:** To maintain an urban park, schoolyard, and garden system which provides open space for outdoor recreation, psychological and physical well-being, and relief from the urban environment.

3.11.3 Impact Analysis

Methodology

This section describes the VMP's potential impacts on recreation. Impacts were evaluated qualitatively, based on the potential for the VMP to disrupt access to and use of existing recreational facilities. Generally, VMP treatment activities may result in a short-term loss of recreational opportunities by disrupting use of or access to recreation areas or facilities. A long-term effect could occur if a recreational opportunity were eliminated as a result of long-term maintenance activities.

Secondary effects on recreational opportunities due to temporary disturbances associated with proposed vegetation management activities (e.g., construction noise, dust and air pollutant emissions, and traffic) are described in other sections of this DEIR. Please refer to Section 3.2, "Aesthetics," for a discussion of the visual changes in the landscape from vegetation management activities; Section 3.3, "Air Quality," for discussion of the VMP's emissions of air pollutants; Section 3.10, "Noise and Vibration," for discussion of the VMP's construction noise effects; and Section 3.12, "Transportation," for discussion of the VMP's temporary effects on traffic flow.

Criteria for Determining Significance

Based on Appendix G of the CEQA Guidelines and City of Oakland CEQA Thresholds of Significance, the VMP would result in a significant impact on recreation if it would:

- Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated; or
- Include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment.
- In addition, for the purposes of this analysis, the VMP would result in a significant impact on recreational resources if it would:
- Result in the loss of available public recreational opportunities.

Issues Not Evaluated Further

The following significance criterion is not discussed further:

- Include Recreational Facilities or Require the Construction or Expansion of Recreation Facilities Which Might Have an Adverse Physical Effect on the Environment. While some vegetation treatment activities would occur at recreational areas throughout Oakland, the VMP would not involve construction or expansion of recreational facilities that could have a physical adverse effect on the environment.

Environmental Impacts

Impact REC-1: Increased Use of Recreational Facilities Such that Substantial Physical Deterioration Would Occur (*Less than Significant*)

Various treatment activities would occur at City parks or near public trails, which may require temporary closure of these facilities. Most vegetation management activities would not require any trail closures and/or most trail closures could be avoided through the installation of temporary signage to alert recreational users of work and spotting. However, some trail closures may be needed within the following parks/open space areas depending on the treatment techniques employed: Dimond Canyon Park, Garber Park, Joaquin Miller Park, King Estate Open Space Park, Knowland Park and Arboretum, North Oakland Sports Field, Sheffield Village Open Space, and Shepherd Canyon Park. For example, brush and tree thinning along trails in Shepherd Canyon Park and Joaquin Miller Park, eucalyptus removal near trails in Garber Park and North Oakland Regional Sports Field, and vegetation management activities near structures in Joaquin Miller Park, Knowland Park and Arboretum, and Sheffield Village Open Space would require temporary trail closures. It should be noted that vegetation management activities would not require the complete closure of City parks or open space areas. In addition, trails may be temporarily closed to provide access for maintenance crews to treatment sites. Such closures would be localized and temporary, typically between 1 to 5 days. However, at the North

Oakland Regional Sports Field, proposed treatments may require temporary closure of the dirt access road/trail for 2 to 4 weeks. While it is possible that these temporary closures could temporarily increase use of other recreational facilities in Oakland, the projects conducted under the VMP would not necessarily occur simultaneously but rather would be phased and prioritized over a 10-year timeframe. In addition, due to the number of City parks/open space areas and other recreational facilities, the VMP would not substantially increase the demand of other recreational facilities such that substantial deterioration would occur.

Conclusion

For the reasons stated above, this impact would be **less than significant** and no mitigation is required.

Impact REC-2: Temporary Disruption of the Use of, or Access to, Recreational Facilities (*Less than Significant with Mitigation*)

As shown in Table 3.11-1, a number of City parks and open space areas require vegetation management in the VMP area. Access to these facilities would occur via existing access roads, City roads, and public trails. Recreational users of roads and trails could experience temporary disruptions during active vegetation management activities. As a result, there is a limited potential for significant impacts to recreational facilities.

As described under Impact REC-1, some treatment activities occurring in the following parks/open space areas may require temporary trail closures: Dimond Canyon Park, Garber Park, Joaquin Miller Park, King Estate Open Space Park, Knowland Park and Arboretum, North Oakland Sports Field, Sheffield Village Open Space, and Shepherd Canyon Park, depending on the treatment techniques employed. In addition, trails may be temporarily closed to provide access for maintenance crews to vegetation treatment sites. Such closures would be temporary, typically between 1 to 5 days, but possibly up to several weeks for work at the North Oakland Sports Field, to maximize public safety during active vegetation management work. Depending on the treatment activity and extent of work area, such closures could temporarily impede recreational use and access. For treatment activities necessitating trail closures in the parks/open space areas listed above, the City would be required to notify the public of any closures as specified in **Mitigation Measure REC-1 (Provide Notification of Temporary Trail Closures)**. The likelihood of significant impacts without mitigation is very low; however, Mitigation Measure REC-1 is included out of an abundance of caution and to facilitate communication with the public. In addition, all closures would be localized and alternative recreational opportunities throughout Oakland would continue to be available.

Mitigation Measures

Mitigation Measure REC-1: Provide Notification of Temporary Trail Closures.

If a treatment project requires temporary trail closures, the City and its contractors will implement the following measures:

- Provide signage at trailheads at least one week prior to temporary trail closure indicating the location and period of closure as well as any trail detours. Notification of treatment activity and trail closure will also be posted on the City's website. All signage will be removed once work is complete.

- Provide road guards to usher recreationalists around hazardous areas where activities impede on a road or trail.
- Provide fencing around the active work area to protect recreationalists, as necessary.

Conclusion

With implementation of Mitigation Measure REC-1, the City would provide signage, road guards, fencing, and detours so that temporary access disruptions or safety hazards caused by vegetation management activities would be minimized. Thus, with implementation of Mitigation Measure REC-1, this impact would be **less than significant with mitigation.**

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3.12 TRANSPORTATION

This section summarizes the environmental and regulatory setting related to transportation and traffic in the context of the VMP. This section also presents the impact methodology and evaluates the potential traffic impacts associated with the VMP.

3.12.1 Environmental Setting

Regional Access

Regional access to the VMP area is available via I-580, SR 24, and SR 13, all of which are part of the California State Highway System. I-580 extends east/west from the US-101 junction in San Rafael to the I-5 junction in the Central Valley. A portion of I-580 runs parallel to the western edge of the VMP area, beginning at Lake Chabot Regional Park. SR 13 is entirely within Alameda County and extends from I-580 near Mills College in Oakland to the I-80/ Ashby Avenue interchange in Berkeley. SR 13 spans the majority of the VMP area. SR 24 is within Alameda and Contra Costa Counties and extends east/west from the I-580/I-890 interchange in Oakland to the I-680 junction in Walnut Creek. A segment of SR 24 bisects the northern portion of the VMP area between the SR 13 junction and Fish Ranch Road.

Local Roadway Network

Access to the VMP area is also provided through a number of arterial, collector and residential/local streets (City of Oakland Department of Transportation [OakDOT] 2020a). Portions of roads that are classified by the City as both arterial and collector streets that run through the VMP area include Grizzly Peak Boulevard (Blvd), Skyline Blvd, Claremont Avenue (Ave), Moraga Ave, Mountain Blvd, Park Blvd, Joaquin Miller Road (Rd), Redwood Rd, Keller Ave, and Golf Links Rd (Figure 2-2, sheets 1 through 10).

Grizzly Peak Blvd runs the eastern perimeter of the VMP area from east of Claremont Canyon Region Reserve until it merges with Skyline Blvd near the Sibley Park Main Staging Area. Skyline Blvd continues on the eastern perimeter of the VMP area until it turns south and extends through Joaquin Miller Park and eventually through the central portion of the VMP area on the western edge of Redwood Regional Park. Claremont Ave runs southwest to northeast between SR 13/Tunnel Rd and Grizzly Peak Rd. The portion of Moraga Ave within the VMP area parallels northbound SR 13 until it meets Mountain Blvd. Mountain Blvd begins near the SR 13/SR 24 junction to the north and parallels northbound SR 13 to the south until it terminates at Joaquin Miller Rd and then resumes just north of Redwood Road. Joaquin Miller Rd begins at the SR 13/Lincoln Ave junction and travels east and south until it merges with Skyline Blvd. Redwood Rd, Keller Ave, and Golf Links Rd extend from Mountain Blvd to the west and run northeast until each merge with Skyline Blvd. Park Blvd runs north/south and flanks the western edge of Dimond Park until its intersection with Mountain Blvd.

Important collector and residential/local streets throughout the VMP area include Broadway, Shepard Canyon Rd, Thornhill Rd, Ascot Drive (Dr), and Snake Rd. Broadway runs just south of SR 24 roughly between SR 13 and Skyline Blvd. Thornhill Dr extends from Moraga Ave to the west and runs northeast until it merges with Snake Rd. Snake Rd extends from Mountain Blvd to the

west and runs northeast until it merges with Skyline Blvd. Ascot Dr extends from Mountain Blvd to the west and runs northeast until it merges with Skyline Blvd.

Public Transit

Alameda-Contra Costa Transit District (AC Transit) is the principal public transit operator in the VMP Area. AC Transit operates three bus routes throughout the VMP area, including the 33, 46, and 339 lines. Paratransit services are provided through East Bay Paratransit and Oakland Paratransit, which is funded by the City and Alameda County Transportation Commission (CTC).

Pedestrian, Bicycle, and Equestrian Access

As discussed in Section 3.11, "Recreation," public recreational access for pedestrians and bicyclists is available throughout the VMP area and include: Beaconsfield Canyon, Garber Park, Dimond Canyon Park, Shepherd Canyon Park, Leona Heights Park, Grizzly Peak Open Space, City Stables, Sheffield Village Open Space, Knowland Park and Arboretum, King Estates Open Space Park, Joaquin Miller Park, Tunnel Road Open Space, Marjorie Saunders Park, and Oak Knoll. For additional information on these recreation areas, see Table 3.11-1, "Parks and Open Spaces in the VMP Area."

Bicycle access on surface streets and arterials throughout the VMP is provided through 16 miles of bike routes along Skyline Blvd, Grizzly Peak Road, Mountain Blvd, Monterey Blvd, and Golf Links Road. Additionally, the Montclair Railroad Trail serves as a shared and protected bicycle/pedestrian trail along Shephard Canyon Road (OakDOT 2018, 2020b). Equestrian access within the VMP area is provided at the City Stables and Joaquin Miller Park.

3.12.2 Regulatory Setting

State Laws, Regulations, and Policies

California Streets and Highways Code

The California Streets and Highways Code provides the standards for administering the statewide system of streets and highways. Designated state route and interstate highway facilities are under the jurisdiction of Caltrans, except where facility management has been delegated to the county transportation authority.

According to Section 660 of the California Streets and Highways Code, permits must be obtained for all proposed activities related to the placement of encroachments within, under, or over the State highway rights of way. Examples of the type of work that may require an encroachment permit include utilities, excavations, vegetation planting or trimming, and surveys (Caltrans 2018a).

California Vehicle Code

Caltrans has discretionary authority with respect to highways under its jurisdiction and may issue a special permit to operate or move a vehicle or combination of vehicles or special mobile equipment of a size or weight of vehicle or load exceeding the maximum limitations specified in the California Vehicle Code (Caltrans 2018b).

Local Laws, Regulations, and Policies

Alameda County Congestion Management Program

The Alameda County Congestion Management Program (CMP) outlines strategies to measure and improve the performance of Alameda County's multimodal transportation system; address roadway congestion and ultimately reduce greenhouse gas emissions. The CMP is updated every two years by the Alameda CTC and is required to include five elements: level of service monitoring of a designated roadway network; a multimodal performance element; a travel demand management element; a land use analysis program; and a capital improvement program. The 2019 CMP describes the work performed by Alameda CTC and progress towards implementation of the major CMP elements since the 2017 update. (Alameda CTC 2019, 2020a).

Alameda Countywide Transportation Plan

The Alameda Countywide Transportation Plan (CTP) is a long-ranging policy document that guides future transportation projects, programs, and policies in Alameda County, and ultimately feeds into the "Plan Bay Area," the region's long-range transportation plan. Updated every four years, the CTP addresses capital, operating, and maintenance activities for all transportation modes. The 2020 CTP supports multi-modal and integrated planning with an emphasis on defining projects that can be pursued over the next ten years. (Alameda CTC 2016, 2020b).

City of Oakland General Plan

Applicable objectives and policies from the City of Oakland General Plan's Land Use and Transportation Element (City of Oakland 1998) that are relevant to the VMP include the following:

Objective T1.5: Reduce truck traffic impacts on residential neighborhoods.

> **Policy T3.5:** The City should include bikeways and pedestrian walks in the planning new, reconstructed, or realized streets, wherever possible.

Objective T6: Make streets safe, pedestrian accessible and attractive.

> **Policy T6.2:** Improving Streetscapes: The city should make major efforts to improve the visual quality of streetscapes, particularly in neighborhoods and commercial centers, should be pedestrian-oriented and include lighting, directional signs, trees, benches, and other support facilities.
>
> **Policy T6.5:** The City should protect and encourage the enhancement of the distinctive character of scenic routes within the city, through prohibition of billboards, design review, and other means.

Oakland Department of Transportation's Strategic Plan

The Oakland Department of Transportation (OakDOT) developed its inaugural Strategic Plan in 2016 to provide a data-driven and trackable summary of OakDOT's commitments and to guide the development of future planning on Oakland streets. The Plan's primary goals include equitable jobs and housing; holistic community safety; vibrant sustainable infrastructure; and

responsive trustworthy government. Each goal includes a number of strategies and along with the one- and three-year benchmarks the agency will use to guide their efforts. (OakDOT 2016).

Applicable goals from the OakDOT's Strategic Plan that are relevant to the VMP include the following:

Holistic Community Safety

1. Adopt a Vision Zero policy and pledge to eliminate traffic injuries and fatalities

3. Incorporate safe and Complete Street designs into the design process:

    - Ensure that safer designs and safety interventions are integrated into routine maintenance and operations, and into all projects

Vibrant Sustainable Infrastructure

2. Plan and develop capital projects in an equitable, timely, efficient and coordinated manner:

    - Create an interdisciplinary, interagency team that develops, coordinates and prioritizes capital projects based on city policies and programs, community proposals, specific plans, private development, utility company projects and identified maintenance needs

12. Green Oakland's streets to improve air and water quality

3.12.3 Impact Analysis

Methodology

Traffic and transportation impacts associated with implementation of the VMP were evaluated using a qualitative analysis due to the temporary nature of the effects on traffic operations; bicycle, pedestrian, and transit facilities; emergency access; and vehicle miles traveled (VMT). The analysis is based on proposed vegetation treatment activities, the equipment utilized for treatments, and methods for transporting equipment and materials. The criteria for determining the significance of potential impacts are outlined below.

Criteria for Determining Significance

Based on Appendix G of the CEQA Guidelines, City of Oakland CEQA Thresholds of Significance, and Transportation Impact Study Guidelines, the VMP would result in a significant impact on transportation or traffic if it would:

- Conflict with a program applicable plan, ordinance, or policy addressing the safety or performance of the circulation system, including transit, roadways, bicycle lanes, and pedestrian paths (except for automobile level of service or other measures of vehicle delay);

- Cause substantial additional VMT per capita, per service population, or other appropriate efficiency measure;

- The following are thresholds of significance related to substantial additional VMT:
  - For residential projects, a project would cause substantial additional VMT if it exceeds existing regional household VMT per capita minus 15 percent.
  - For office projects, a project would cause substantial additional VMT if it exceeds the existing regional VMT per employee minus 15 percent.
  - For retail projects, a project would cause substantial additional VMT if it exceeds the existing regional VMT per capita minus 15 percent.
- Substantially induce additional automobile travel by increasing physical roadway capacity in congested areas (i.e., by adding new mixed-flow lanes) or by adding new roadways to the network;
- Conflict or be inconsistent with CEQA Guidelines Section 15064.3, subdivision (b):

  (b) Criteria for Analyzing Transportation Impacts.

  1) *Land Use Projects*. Vehicle miles traveled exceeding an applicable threshold of significance may indicate a significant impact. Generally, projects within one-half mile of either an existing major transit stop or a stop along an existing high quality transit corridor should be presumed to cause a less than significant transportation impact. Projects that decrease vehicle miles traveled in the project area compared to existing conditions should be considered to have a less than significant transportation impact.

  2) *Transportation Projects*. Transportation projects that reduce, or have no impact on, vehicle miles traveled should be presumed to cause a less than significant transportation impact. For roadway capacity projects, agencies have discretion to determine the appropriate measure of transportation impact consistent with CEQA and other applicable requirements. To the extent that such impacts have already been adequately addressed at a programmatic level, a lead agency may tier from that analysis as provided in Section 15152.

  3) *Qualitative Analysis.* If existing models or methods are not available to estimate the vehicle miles traveled for the particular project being considered, a lead agency may analyze the project's vehicle miles traveled qualitatively. Such a qualitative analysis would evaluate factors such as the availability of transit, proximity to other destinations, etc. For many projects, a qualitative analysis of construction traffic may be appropriate.

  4) *Methodology*. A lead agency has discretion to choose the most appropriate methodology to evaluate a project's vehicle miles traveled, including whether to express the change in absolute terms, per capita, per household or in any other measure. A lead agency may use models to estimate a project's vehicle miles traveled, and may revise those estimates to reflect professional judgment based on substantial evidence. Any assumptions used to estimate vehicle miles traveled and any revisions to model outputs should be documented and

explained in the environmental document prepared for the project. The standard of adequacy in Section 15151 shall apply to the analysis described in this section.

- Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment); or
- Result in inadequate emergency access.

Issues Not Evaluated Further

Due to the nature of the VMP, there would be no impacts related to the following significance criterion:

- **Substantially Induce Additional Automobile Travel by Increasing Roadway Capacity or Adding New Roadways to the Network:** The VMP would not increase physical roadway capacity or add new roadways to the network. All vehicle trips associated with VMP activities would utilize existing roadways or maintenance roads previously established by the City of Oakland.

Environmental Impacts

Impact TRA-1: Conflict with a Program Applicable Plan, Ordinance or Policy Addressing the Circulation System, Including Transit, Roadway, Bicycle and Pedestrian Facilities (*Less than Significant with Mitigation*)

Proposed vegetation treatment activities would generate worker and maintenance vehicle trips, which could require temporary lane closure along roadways in the VMP area. VMP-related vehicular traffic could also require temporary re-routing of bicycle routes along Skyline Blvd, Grizzly Peak Rd, Mountain Blvd, Monterey Blvd, and Golf Links Rd. Additionally, temporary closure of sidewalks or parking areas adjacent to City facilities and open spaces could also occur throughout the VMP area, such as along Skyline Blvd.

As described in Chapter 2, *Project* Description, the estimated number of personnel required at each project site could range from a single worker for treatment activities such as grass removal to upwards of 18 workers for tree removal activities (see Table 2-4 for estimated number of personnel required by each VMP treatment type). While vegetation management activities would occur year-round (and potentially more than once annually), it is not yet known which and how many treatment projects would be conducted in a given year. However, maximum annual acreages of treatment activities have been developed (see Table 2-7). It can be assumed that more frequent worker and maintenance trips would occur in treatment areas that encompass larger areas and involve more labor-intensive treatment techniques (i.e., hand removal of trees). As such, the potential for impacts on the circulation system, including transit, roadway, bicycle, and pedestrian facilities, during vegetation treatment would differ by treatment area type as well as vegetation management activity. Additionally, the VMP would prioritize vegetation treatment areas into three different categories, with implementation of Priority 1 and Priority 2 projects taking precedence, and Priority 3 projects being implemented as budget is available. The City would likely treat priority roadsides (Priority 1 treatment areas)

at least every 3 years and possibly more frequently. It is anticipated that the remaining roadside areas (Priority treatment 2 areas) would be treated every 3-5 years.

The following sections discuss potential impacts to the circulation system by treatment area type. This analysis focuses on impacts to the circulation system from VMP treatments along roadsides or near roadsides, as these activities are anticipated to have the greatest potential impact on the circulation system. Impacts to the circulation system from non-roadside VMP treatments such as those occurring within open spaces, parks, trails or on private parcels would involve increased worker and hauling trips but would not be expected to significantly alter traffic flow or result in partial lane closures. The potential for increased vehicle miles traveled (VMT) as a result of the VMP is addressed in Impact TRA-2.

Roadside Treatment Areas and Medians

Roadside treatment includes areas within 30 feet from roadside edges (including City-owned medians) along major access/egress routes. Under the baseline condition, the City currently conducts approximately 400 acres of roadside treatment activities annually using a combination of hand labor and mechanical methods, which requires 10-15 workers and one employee from OFD. Work occurring in roadside treatment areas and medians under the VMP would encompass all roads in the VMP area (308 miles). Similar to current practices, typical activities for VMP treatments would include reducing ladder fuels, controlling highly flammable species, maintaining fuel loads, reducing ignitable surface fuels, and pruning tree canopies. Priority 1 activities would focus on approximately 30 miles of main access/egress routes in the VMP area as well as manual treatment (grass and tree removal) on 5.8 acres of medians.

Under the VMP, the City would conduct approximately 500 acres of roadside treatment activities annually using a combination of hand labor and mechanical methods. Thus, roadside treatment would increase beyond the City's current baseline by approximately 100 acres. The typical number of workers at any given treatment site would be similar to baseline conditions (10-15 workers) but a maximum of 18 workers may be needed to conduct individual roadside treatment activities under the VMP. Assuming that a maximum of 18 workers would be required at roadside and median treatment areas, the VMP would result in increased worker and maintenance vehicle trips. These activities would likely occur every three years in the case of Priority 1 roadside treatment areas and every 3-5 years for Priority 2 areas. As a result, any additional vehicle trips would not have an appreciable effect on traffic flow and would be unlikely to permanently affect transit, bicycle, and pedestrian facilities beyond baseline conditions. However, VMP treatment activities may result in temporary lane closures, temporary rerouting of bicycle routes, and temporary closure of sidewalks or parking areas; these temporary effects on the transportation system would conflict with City and County policies related to safety during routine maintenance activities and reducing truck traffic impacts in residential neighborhoods, which would be a significant impact. Implementation of traffic and safety protocols would be necessary to avoid these temporary impacts. Implementation of **Mitigation Measure TRA-1 (Maintain Traffic Flow)** would maintain two-way traffic flow to the extent feasible. In the event of temporary lane closures, implementation of **Mitigation Measure TRA-2 (Traffic Control and Public Safety)** would include measures to guide traffic; safeguard construction workers; provide safe passage of vehicles, pedestrians, and bicyclists; and maintain public transit access.

Ridgetop Areas

Ridgetop areas include the North Oakland Regional Sports Field, Grizzly Peak Open Space, and City Stables (although no specific projects have been identified on this property at this time) and encompass approximately 130.2 acres of City-owned land. With the exception of City Stables, management practices in ridgetop areas currently involve a combination of grazing and roadside treatment activities (e.g., hand labor and mechanical techniques). Priority 1 roadside activities under the VMP would be expanded to Tunnel Road and additional segments of Bay Forest Drive (an additional 28.5 acres of treatment area) and would require crews of up to 18 workers. The approximate duration of these activities would be approximately 17 days. Thus, VMP-related vehicular activity associated with ridgetop areas would amount to an increase over baseline conditions, although impacts would be short term in duration, similar to conditions under the City's current vegetation management activities. VMP treatment activities may result in temporary lane closures, temporary rerouting of bicycle routes, and temporary closure of sidewalks or parking areas; these temporary effects on the transportation system would conflict with City and County policies related to safety during routine maintenance activities and reducing truck traffic impacts in residential neighborhoods, which would be a significant impact. Implementation of traffic and safety protocols would be necessary to avoid these temporary impacts. Implementation of Mitigation Measures TRA-1 and TRA-2 would maintain traffic flow; provide safe passage of vehicles, pedestrians, and bicyclists; and maintain public transit access.

Canyon Areas

Canyon areas, including Garber Park, Dimond Canyon Park, Shepherd Canyon Park, Leona Heights Park, and Beaconsfield Canyon, encompass approximately 188.7 acres. With the exception of Beaconsfield Canyon, these areas currently include roadside treatment activities, which would be expanded to additional Priority 1 roadway areas including: manual treatment (grass removal) along Claremont Ave (1.34 acres); manual treatment (tree removal) along Park Boulevard, Monterey Boulevard, Leimert Boulevard and El Centro Avenue (3.42 acres); manual treatment (tree removal) along Shepherd Canyon Road, Escher Drive, Snake Road, and Bagshotte Drive (9.26 acres); and manual treatment (tree removal) along Campus Drive (1.86 acres). These activities would require crews of up to 18 workers, resulting in increased worker and maintenance vehicle trips. Additionally, the approximate duration for these management activities would be 15 days. Thus, VMP-related vehicular activity associated with Canyon Areas would amount to an increase over current conditions, although impacts would be short term in duration, similar to conditions under the City's current vegetation management activities. VMP treatment activities may result in temporary lane closures, temporary rerouting of bicycle routes, and temporary closure of sidewalks or parking areas; these temporary effects on the transportation system would conflict with City and Alameda County policies related to safety during routine maintenance activities and reducing truck traffic impacts in residential neighborhoods, which would be a significant impact. Implementation of traffic and safety protocols would be necessary to avoid these temporary impacts. Implementation of Mitigation Measures TRA-1 and TRA-2 would maintain traffic flow; provide safe passage of vehicles, pedestrians, and bicyclists; and maintain public transit access.

City Parks and Open Space Areas

City parks and open space areas, including Sheffield Village Open Space, Knowland Park and Arboretum, Joaquin Miller Park, King Estate Open Space Park, and other small City-owned

parcels (see Table 2-4), encompass approximately 1,552.9 acres. Current vegetation management practices include a combination of roadside treatment through the use of hand labor or mechanical techniques, grazing, trail maintenance and vegetation management around parking lots and structures through hand labor. Priority 1 roadside activities would be expanded by approximately 100 acres per year of mechanical and manual treatment compared to baseline conditions. These activities would occur along portions of Skyline Blvd, Golf Links Road, Woodside Glen Court, Joaquin Miller Road, Mountain Boulevard, Fontaine Street, and Crest Avenue. These activities would require crews of up to 18 workers, resulting in increased worker and maintenance vehicle trips. Additionally, the approximate duration for these management activities would be 98 days. Thus, VMP-related vehicular activity associated with City parks and open space areas would amount to an increase over current conditions, although impacts would be short term in duration, similar to conditions under the City's current vegetation management activities. VMP treatment activities may result in temporary lane closures, temporary rerouting of bicycle routes, and temporary closure of sidewalks or parking areas; these temporary effects on the transportation system would conflict with City and Alameda County policies related to safety during routine maintenance activities and reducing truck traffic impacts in residential neighborhoods, which would be a significant impact. Implementation of traffic and safety protocols would be necessary to avoid these temporary impacts. Implementation of Mitigation Measures TRA-1 and TRA-2 would maintain traffic flow; provide safe passage of vehicles, pedestrians, and bicyclists; and maintain public transit access.

Urban and Residential Parcels

City-owned urban and residential parcels include manual vegetation management and grazing and collectively encompass 47.5 acres. These activities would continue under the VMP, lasting approximately 19 days and requiring crews of up to 18 workers, which would increase worker and maintenance vehicle trips relative to baseline conditions. However, VMP-related vehicular activity related to urban and residential parcels would not amount to an appreciable increase over current conditions, and roadside treatment would be limited to the portions of these parcels which abut roadways. The impact would be less than significant and no mitigation is required.

Other Areas

This classification includes 43 properties (e.g., parking lots, playground, urban parks) encompassing 24.5 total acres. No current vegetation management activities are conducted on these parcels by OFD and no additional vegetation management treatments are identified for these parcels, which are considered Priority 3. The impact would be less than significant and no mitigation is required.

Mitigation Measures

Mitigation Measure TRA-1: Maintain Traffic Flow

The City and its contractors will implement the following measures:

- To the extent feasible, work will be staged and conducted in a manner that maintains two-way traffic flow on roadways in the vicinity of the work site.

- Heavy equipment and haul traffic will be avoided in residential areas to the greatest extent feasible. When no other route to and from the site is available, heavy equipment and haul traffic through residential areas shall be restricted to the hours of 8 a.m. to 5:30 p.m., Monday through Friday.

- If heavy equipment or hauling is required beyond the hours above, the City or its contractor will provide notice to adjacent property owners 48 hours in advance of such activities.

Mitigation Measure TRA-2: Traffic Control and Public Safety

The City and its contractors will implement the following measures:

- In the event that work activities require the temporary closure of any traffic lanes, the City will implement measures to guide traffic (such as signage and flaggers), safeguard construction workers, provide safe passage of vehicles, and minimize traffic impacts through the duration of work activities. The City also will notify local emergency service providers regarding any planned lane closures.

- For any other work within or near the roadway that could pose a hazard to the public, the City will install/implement appropriate measures, such as fences, barriers, flagging, guards, and/or signs, to give adequate warning and provide protection from the potentially dangerous condition.

- For work activities along or near roadways with sidewalks and bike routes/lanes, the City will implement measures to ensure the safe passage of pedestrians and bicyclists around the work site.

- Public transit access and routes will be maintained in the vicinity of the work site. If public transit will be affected by temporary road closures and require detours, the City will consult affected transit authorities and keep them informed of project activities.

Conclusion

The VMP would have a beneficial effect on the circulation system through the removal of hazardous trees and vegetation along roadsides, and any impacts to roadways would be temporary in nature. However, there is still the potential for reduced lane capacity in the local roadway network from treatment activities. Implementation of Mitigation Measure TRA-1 would maintain two-way traffic flow to the extent feasible. In the event of temporary lane closures, implementation of Mitigation Measure TRA-2 would include measures to guide traffic; safeguard construction workers; provide safe passage of vehicles, pedestrians, and bicyclists; and maintain public transit access. Therefore, this impact would be **less than significant with mitigation**.

Impact TRA-2: Result in Substantial Increase in Vehicle Miles Traveled (*Less than Significant*)

Under current vegetation management activities, the City treats approximately 1,300 acres annually, which includes 900 acres of grazing and 400 acres of hand labor and mechanical treatment of roadsides, small city parcels and open space areas. While the VMP would include many of the same practices already in place, it would expand and introduce new activities throughout nearly all treatment area types, for an annual total of approximately 1,600 acres. It is not yet known which and how many treatment projects would be conducted in a given year, although maximum annual acreages of treatment activities have been developed (see Table 2-7). It is estimated that total annual VMT per capita would be approximately 0.12 mile (or annual VMT of 52,958 miles), compared to approximately 0.08 mile (or annual VMT of 35,986 miles) under the City's current vegetation management practices (see Appendix C, *Air Quality/Greenhouse Gas Calculations*, of this DEIR for calculations). As such, the increase in treatment acreage under the VMP would result in an increase in VMT over baseline conditions due to additional maintenance vehicle trips, worker trips and vegetation hauling.

According to the California Governor's Office of Planning and Research (OPR) Technical Advisory on Evaluating Transportation Impacts, projects that generate or attract fewer than 110 trips per day generally may be assumed to cause a less-than-significant transportation impact, absent substantial evidence indicating otherwise (OPR 2018). Similarly, the City of Oakland CEQA Thresholds of Significance and Transportation Impact Study Guidelines indicates that small projects generating fewer than 100 vehicle trips per day are also generally assumed to cause a less-than-significant transportation impact. As discussed in Impact TRA-1, current activities would require a maximum of 15 workers per project. Under the VMP, this would increase to a maximum of 18 workers across all activities. The addition of 3 workers would result in 6 additional daily vehicle trips[9] beyond the City's current activities for the duration of each project. Thus, even with two crews employed simultaneously with maximum personnel (i.e., two crews of 18 yielding a total of 72 trips), the increase in daily VMT (approximately 65 miles) would result in vehicle trips below the City's threshold of 100 trips per day and OPR's threshold of 110 trips per day. Given that the small (0.04 mile per capita or 16,972 miles) annual increase in VMT does not exceed City or state criteria, this impact would be less than significant and no mitigation is required.

Conclusion

The VMP would increase VMT per capita by 0.04 mile per capita per year, which would not be a substantial increase in VMT per capita. The increase of up to 6 vehicle trips per day to conduct VMP treatment activities would not exceed the aforementioned thresholds of 100 and 110 vehicle trips per day. Therefore, this impact would be **less than significant** and no mitigation is required.

[9] It is assumed that each worker represents a trip to and from the worksite (i.e., two vehicle trips).

Impact TRA-3: Substantially Increase Hazards due to a Design Feature or Incompatible Uses (*Less than Significant with Mitigation*)

The VMP would not change the design of any roadway or intersection. Roadside and median treatments conducted throughout the VMP area would have the benefit of maintaining site distances for motorists, thereby minimizing potentially hazardous conditions resulting from overgrowth of roadside vegetation. However, treatment activities could pose hazards to motorists, bicyclists, and pedestrians due to incompatible uses such as operation of maintenance vehicles on roadsides, ad-hoc parking along roadsides, and operation of vegetation management equipment. There is a small likelihood that these uses would substantially increase hazards, which would be a significant impact. Implementation of Mitigation Measure TRA-1 restrict the hours of heavy equipment and haul traffic through residential areas to the extent feasible. Implementation of Mitigation Measure TRA-2 would minimize the potential for the presence of vehicles and heavy equipment to result in adverse impacts through the use of signage and flaggers, as well as public notification of any planned lane closures.

Mitigation Measures

Mitigation Measure TRA-1: Maintain Traffic Flow

See text in Impact TRA-1 above.

Mitigation Measure TRA-2: Traffic Control and Public Safety

See text in Impact TRA-1 above.

Conclusion

Implementation of the avoidance measures described in the VMP as well as Mitigation Measures TRA-1 and TRA-2 would minimize the potential for design features or incompatible uses in the VMP area to result in increased roadway hazards. Therefore, this impact would be **less than significant with mitigation**.

Impact TRA-4: Result in Inadequate Emergency Access (*Less than Significant with Mitigation*)

The VMP would not include any activities that would permanently block or constrain publicly accessible roadways or emergency access routes. Rather, in the long term, the VMP would reduce fuel loads and clear roadside vegetation, which would improve emergency access for first responders and firefighters, and residents needing to evacuate in case of a wildfire or other emergency.

During some roadside/median treatment activities, partial lane closure may be required on a short-term basis. As discussed in Section 3.8, “Hazards and Hazardous Materials,” many of the roads proposed for treatment in the VMP are also identified evacuation routes in the City of Oakland’s General Plan, Safety Element. Operation of heavy mechanical equipment, haul or transport trucks, or vehicles along these roadways during treatment activities could temporarily limit the mobility of emergency response vehicles or cause congestion for residents attempting to evacuate the area. Although any lane closures would be temporary in nature, this would be a significant impact. Implementation of Mitigation Measure TRA-1 would maintain two-way traffic

flow to the extent feasible during treatment activities, and implementation of Mitigation Measure TRA-2 would include measures to guide traffic, safeguard construction workers, provide safe passage of vehicles, and notify local emergency service providers regarding any planned lane closures.

Mitigation Measures

The City would implement the following mitigation measures to reduce Impact TRA-4:

Mitigation Measure TRA-1: Maintain Traffic Flow

See text in Impact TRA-1 above.

Mitigation Measure TRA-2: Traffic Control and Public Safety

See text in Impact TRA-1 above.

Conclusion

VMP activities would have a beneficial effect on emergency response in the long term by ensuring that emergency vehicle and evacuation access is maintained along roadsides through vegetation clearance and fuel reduction. While emergency access may be hindered temporarily as a result of treatment activities, implementation of the Mitigation Measures TRA-1 and TRA-2 would minimize these effects. Therefore, this impact would be **less than significant with mitigation**.

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3.13 TRIBAL CULTURAL RESOURCES

This section summarizes the environmental and regulatory setting related to tribal cultural resources (TCRs) in the context of the VMP. This section also presents the impact methodology and evaluates the potential impacts on TCRs associated with the VMP. Detailed information about Native American consultation for the VMP is provided in **Appendix G**, *Tribal Cultural Resources*, of this DEIR.

3.13.1 Environmental Setting

The prehistory, ethnography, and history of the VMP area are described in Section 3.5, "Cultural Resources." As described in that section, an APE would be established for each individual project conducted under the VMP that requires a federal permit. Each APE would encompass the project's area of direct impact and a 20-foot buffer, as well as construction staging areas and access improvements, as necessary.

3.13.2 Regulatory Setting

Federal Laws, Regulations, and Policies

Federal law does not address TCRs, as these resources are defined in the California Public Resources Code. However, similar resources called tribal cultural properties (TCPs), fall under the purview of Section 106 of the NHPA, as described in Section 3.5, "Cultural Resources." TCPs are locations of cultural value that are historic properties. A place of cultural value is eligible as a TCP "because of its association with cultural practices or beliefs of a living community that (a) are rooted in that community's history, and (b) are important in maintaining the continuing cultural identity of the community" (Parker and King 1990, rev. 1998). A TCP must be a tangible property, meaning that it must be a place with a referenced location, and it must have been continually a part of the community's cultural practices and beliefs for the past 50 years or more. Unlike TCRs, TCPs can be associated with communities other than Native American tribes, although the resources are usually associated with tribes. By definition, TCPs are historic properties; that is, they meet the eligibility criteria as a historic property for listing in the NRHP. Therefore, as historic properties, TCPs must be treated according to the implementing regulations found in 36 CFR Section 800, as amended in 2001.

State Laws, Regulations, and Policies

AB 52 requires that state lead agencies consult with any California Native American tribe that is traditionally and culturally affiliated with the geographic area of a proposed project, if requested by the tribe. The bill, chaptered in Pub. Res. Code Section 21084.2, also specifies that a project with an effect that may cause a substantial adverse change in the significance of a TCR is a project that may have a significant effect on the environment.

As defined in Pub. Res. Code Section 21074(a), TCRs are:

(1) Sites, features, places, cultural landscapes, sacred places and objects with cultural value to a California Native American tribe that are either of the following:

(A) Included or determined to be eligible for inclusion in the California Register of Historical Resources; or

(B) Included in a local register of historical resources as defined in subdivision (k) of Section 5020.1.

(2) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Section 5024.1. In applying the criteria set forth in subdivision (c) of Section 5024.1 for the purposes of this paragraph, the lead agency shall consider the significance of the resource to a California Native American tribe.

TCRs are further defined in Pub. Res. Code Section 21074 as follows:

(b) A cultural landscape that meets the criteria of subdivision (a) is a TCR to the extent that the landscape is geographically defined in terms of the size and scope of the landscape; and

(c) A historical resource described in Section 21084.1, a unique archaeological resource as defined in subdivision (g) of Section 21083.2, or a "nonunique archaeological resource" as defined in subdivision (h) of Section 21083.2 may also be a tribal cultural resource if it conforms with the criteria of subdivision (a).

Mitigation measures for TCRs must be developed in consultation with the affected California Native American tribe pursuant to newly chaptered Pub. Res. Code Section 21080.3.2 or according to Section 21084.3. Section 21084.3 identifies mitigation measures than include avoidance and preservation of TCRs and treating TRCs with culturally appropriate dignity, taking into account the tribal cultural values and meaning of the resource.

Local Laws, Regulations, and Policies

The City of Oakland does not have any laws, regulations, or policies for tribal cultural resources.

3.13.3 Impact Analysis

Methodology

An email request was made to the NAHC on August 12, 2019, to review its files for the presence of recorded sacred sites in the VMP area. The NAHC responded on August 16, 2019, stating that no significant resources have been filed in the vicinity of the VMP area as a result of a search of their files. The NAHC also provided a list of seven tribes with a traditional and cultural affiliation with the VMP area.

When the NOP was issued for the VMP, the City had not received any requests from tribes for project notification pursuant to Pub. Res. Code Section 21080.3.1(b)(1). However, in the spirit of AB 52, the City emailed project notification letters, dated August 19, 2019, to all seven tribes identified by the NAHC. An email follow-up was forwarded to those tribes that had not responded on May 4, 2020. **Table 3.13-1** lists all those contacted and summarizes the results of the consultation.

Table 3.13-1. Native American Consultation

Organization/Tribe	Name of Contact	Emailed Letter Date	Email Follow-up	Responses
Amah Mutsun Tribal Band	Valentine Lopez, Chairperson	August 19, 2019	n/a	**09/02/2019:** Chairperson Lopez responded that the VMP area is outside their traditional tribal territory.
Amah Mutsun Tribal Band of Mission San Juan Bautista	Irenne Zwierlein, Chairperson	August 19, 2019	May 4, 2020	No response, to date.
Indian Canyon Mutsun Band of Costanoan	Ann Marie Sayers, Chairperson	August 19, 2019	May 4, 2020	No response, to date.
Muwekma Ohlone Indian Tribe of the SF Bay Area	Charlene Nijmeh, Chairperson	August 19, 2019	May 4, 2020	No response, to date.
North Valley Yokuts Tribe	Katherine Erolinda Perez, Chairperson	August 19, 2019	May 4, 2020	No response, to date.
The Confederated Villages of Lisjan	Corrina Gould, Chairperson	August 19, 2019	June 29, 2020	**09/17/19:** Chairperson Gould acknowledged receipt of the documents and said she would review them. **06/29/2020:** Horizon reached out to Chairperson Gould to see if she had any comments.
The Ohlone Indian Tribe	Andrew Galvin	August 19, 2019	June 15, 2020	**09/08/2019:** Mr. Galvin asked if a record search or survey had been completed, and asked for copies if they were available. **09/09/2019:** Mr. Galvin was informed that a record search would be completed once the NOP was filed and that copies would be sent to him when available. **06/15/2020:** Horizon forwarded the record search results to Mr. Galvin.

Criteria for Determining Significance

Based on Appendix G of the CEQA Guidelines, the VMP would result in a significant impact on tribal cultural resources if it would:

- Cause a substantial adverse change in the significance of a TCR, defined in Pub. Res. Code Section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American Tribe, and that is:
  - Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Pub. Res. Code Section 5020.1(k), or
  - A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Pub. Res. Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Pub. Res. Code Section 5024.1 for the purposes of this paragraph, the lead agency shall consider the significance of the resource to a California Native American tribe.

Environmental Impacts

Impact TCR-1: Substantial Adverse Change in the Significance of a Tribal Cultural Resource (*Less than Significant with Mitigation*)

No tribal cultural resources have been reported by the NAHC, and none of the contacted tribes have provided information about TCRs; therefore, there would be no impact on such resources. However, if archaeological sites are discovered during VMP activities, they could be determined to be TCRs. This is particularly true of resources with human remains. Therefore, this is a potentially significant impact. However, application of **Mitigation Measure CUL-1 (Provide Sensitivity Training, Assess Archaeological Sensitivity, and Survey Areas of High or Highest Sensitivity)** would provide City and volunteer workers with information about identifying archaeological resources that could be TCRs, assess treatment areas for archaeological sensitivity, and inspect areas of high and highest sensitivity for the presence of archaeological resources that could be TCRs **Mitigation Measure CUL-2 (Avoid Use of Techniques That Cause Ground Disturbance within Known Archaeological Historical Resources)** would ensure that archaeological sites that are TCRs would be protected from disturbance by VMP techniques. **Mitigation Measure CUL-3 (Response Measures for Potential Unknown Archaeological Resources and Tribal Cultural Resources)** would ensure that archaeological resources discovered during implementation of the VMP would be protected in place or evaluated, and that Native American tribes would be consulted if the discovered site is of Native American origin and determined to be a TCR. **Mitigation Measure CUL-4 (Stop Work if Human Remains Are Unearthed during Project Activities)** would reduce potential disturbance of human remains by ensuring compliance with the California Health and Safety Code. Implementation of Mitigation Measures CUL-1 through CUL-4 would ensure that potential effects on archaeological and historical resources in VMP treatment areas would be reduced to a less-than-significant level.

Mitigation Measures

The following mitigation measures would be implemented to reduce Impact TCR-1 to a less-than-significant level:

Mitigation Measure CUL-1: Provide Sensitivity Training, Assess Archaeological Sensitivity, and Survey Areas of High or Highest Sensitivity

See text in Section 3.5, "Cultural Resources."

Mitigation Measure CUL-2: Avoid Use of Techniques That Cause Ground Disturbance within Known Archaeological Historical Resources

See text in Section 3.5, "Cultural Resources."

Mitigation Measure CUL-3: Stop Work if Cultural Remains Are Unearthed and Work with Local Native American Tribes if the Site Is Determined to Be a Tribal Cultural Resource

See text in Section 3.5, "Cultural Resources."

Mitigation Measure CUL-4: Stop Work if Human Remains Are Unearthed during Project Activities

See text in Section 3.5, "Cultural Resources."

Conclusion

No tribal cultural resources have been identified within the VMP area. However, VMP activities could have a significant impact on inadvertently discovered archaeological remains, particularly human remains, that could be determined to be tribal cultural resources. Implementation of Mitigation Measures CUL-1 through CUL-4 would reduce impacts to a less-than-significant level. As a result, potential effects on archaeological and historical resources in VMP treatment areas would be **less than significant with mitigation.**

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3.14 WILDFIRE

This section summarizes the environmental and regulatory setting related to wildfire in the context of the VMP. This section also presents the impact methodology and evaluates the potential wildfire impacts associated with the VMP.

3.14.1 Environmental Setting

The VMP is located within the City's VHFHSZ, as designated by CAL FIRE and defined in Section 4904.3 of the Oakland Fire Code (Oakland Municipal Code Chapter 15.12) (**Figure 3.14-1**). The pattern of development and land uses within the VMP area (and VHFHSZ) creates conditions that can be described as representing either a WUI or an Intermix.

The Oakland Hills present a complex wildfire environment that presents a significant risk to public and firefighter safety and to the built and natural environment. The region has been subject to numerous damaging wildland fires, is influenced by local extreme wind and weather conditions (including Diablo wind events), has steep and varied terrain, and encompasses a wide range of different vegetation types. This area is one of the highest risk areas in the country for devastating WUI fires. It is also the location of one of the state's most destructive historic wildfires, the 1991 Tunnel Fire which destroyed 2,900 structures, injured more than 150 people, and killed 25 people (CAL FIRE 2020). Most wildfires in Oakland have burned in the months of September, October, or November when vegetation has lower fuel moistures and Diablo winds return to the VMP area.

Of the variables that comprise the wildland fire environment (weather, terrain, and fuels or vegetation), vegetation is the only variable that can be managed. The goal of vegetation management in the VMP is not the wholesale removal of all vegetation, but targeted vegetation management activities to minimize the potential for ignitions, crown fires, and extreme fire behavior. This is accomplished by reducing and maintaining reduced fuel loads and altering the structure, composition, and spacing of retained vegetation.

Current and Recent Vegetation Management Activities Led by OFD

OFD's Fire Prevention Bureau currently operates a vegetation inspection program that covers approximately 26,000 public and private property inspections annually in the VHFHSZ portion of the City. Inspections are mandated by City of Oakland Ordinance No. 11640. On an annual basis, fire companies and vegetation management inspectors inspect these properties to identify those that are out of compliance with the City's defensible space standards. Repeat inspections are conducted until properties are brought to compliance.

OFD has been actively managing vegetation on City-owned property since 2003 to minimize wildfire hazard in the VMP area, utilizing various techniques including grazing, hand crews, and limited mechanical treatments. Approximately 3,000 goats have been utilized annually (typically between May and August) to manage fine fuels on approximately 600-700 acres of City-owned property, typically on larger City park land and open space (e.g., King Estate Open Space Park, Joaquin Miller Park, Knowland Park, Sheffield Village Open Space, Shepherd Canyon, and London Road). Goats have been used in large treatment areas where manual labor is cost-

prohibitive to treat vegetation in areas that are inaccessible to mowing equipment or in areas too steep for hand crews. In addition, OFD has historically used hand labor for managing vegetation on urban and residential parcels, roadsides, and small treatment areas within larger parks or open space areas. OFD annually contracts with private contractors to manage vegetation on urban and residential parcels. The use of hand labor is focused on reducing ladder fuels, controlling highly flammable/rapidly spreading species (e.g., broom), reducing surface fuels (e.g., grasses, weeds, down material), thinning vegetation, maintaining fuel loads, and pruning tree canopies. Lastly, mechanical equipment is used on an as-needed basis to grade or disk fire trails, reduce ladder fuels (e.g., small tree removal), control highly flammable/rapidly spreading species, reduce surface fuels (e.g., mowing grasses), chip and spread trimmings and down material, thin vegetation, and maintain reduced or target fuel loads.

Between 2004 and 2017, OFD conducted vegetation management activities throughout the WPAD, a City-funded special assessment district that coincides with the City's VHFHSZ, which financed the costs and expenses related to vegetation management, yard waste disposal, wildfire prevention education and fire patrols in the Oakland hills. The WPAD was disbanded in June 2017. Since 2017, OFD has continued to conduct vegetation management activities on City properties and along roads albeit at a lesser degree than when the WPAD was in place due to funding constraints.

Climate Change

Increased wildfire risk and severity are anticipated throughout California due to the progression of climate change (Westerling 2018, Krawchuk et al. 2009). Ten of the most destructive fires in California have occurred since 2015 (CAL FIRE 2020), and California is facing a dramatic increase in the number and severity of wildfires. The Fourth Climate Assessment (Bedsworth et al. 2018), projects that California's wildfire burn area likely will increase by 77 percent by the end of the century. As identified in Governor Newsom's Strike Force report (State of California 2019), the growing risk of catastrophic wildfires has created an imperative for the state to act urgently and swiftly to expand fire prevention efforts. The VMP anticipates an increase in wildfire potential due to climate change, and seeks to manage fuels such that wildfire impacts are reduced.

3.14.2 Regulatory Setting

Federal Laws, Regulations, and Policies

No federal regulations related to wildfire risk and prevention apply to the VMP.

State Laws, Regulations, and Policies

2018 Strategic Fire Plan for California

The Strategic Fire Plan, developed by the State Board of Forestry and Fire Protection, provides direction and guidance to CAL FIRE and its 21 field units. The 2018 Plan sets forth a number of goals focused on fire prevention, natural resource management, and fire suppression efforts, and are summarized here:

a. Improve the availability and use of consistent, shared information on hazard and risk assessment;

b. Promote the role of local planning processes, including general plans, new development, and existing developments, and recognize individual landowner/ homeowner responsibilities;

c. Foster a shared vision among communities and the multiple fire protection jurisdictions, including county-based plans and community-based plans such as Community Wildfire Protection Plans (CWPPs);

d. Increase awareness and actions to improve fire resistance of man-made assets at risk;

e. Increase awareness and actions to improve fire resistance of man-made assets at risk and fire resilience of wildland environments through natural resource management;

f. Integrate implementation of fire and vegetative fuels management practices consistent with the priorities of landowners or managers;

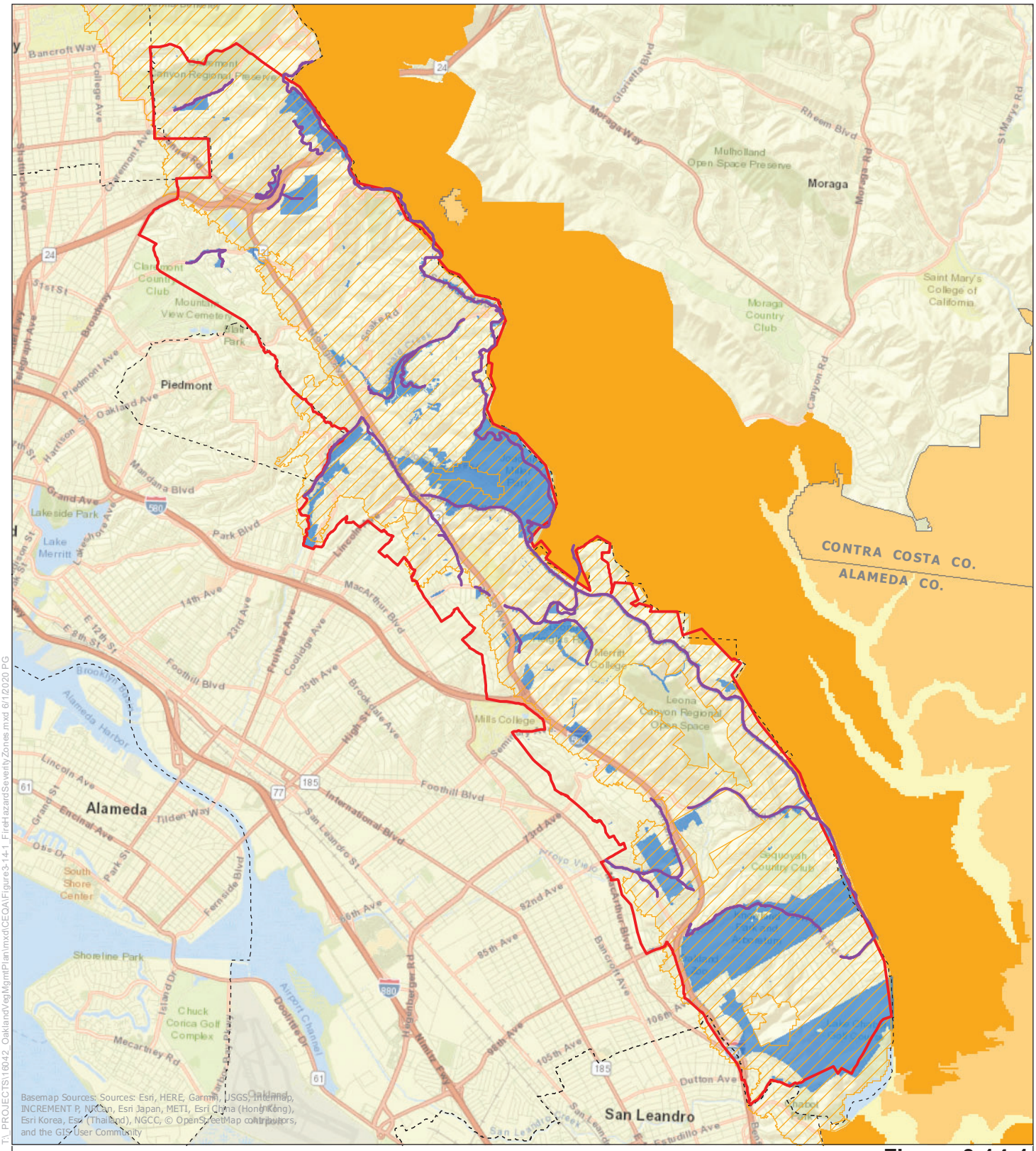
g. Determine and seek the needed level of resources for fire prevention, natural resource management, fire suppression, and related services; and

h. Implement needed assessments and actions for post-fire protection and recovery.

California Public Resources Code

The Public Resources Code includes fire safety regulations restricting the use of certain equipment that could produce sparks or flames, and specifies requirements for the safe use of gasoline-powered tools in fire hazard areas. City staff and contractors must comply with the following requirements in the PRC during VMP activities at any sites with forest-, brush-, or grass-covered land:

a. Earthmoving and portable equipment with internal combustion engines must be equipped with a spark arrestor to reduce the potential for igniting a wildland fire (Pub. Res. Code Section 4442).



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Plan Area Parcels

City Limits

Priority Roadsides

Very High Fire Hazard Severity Zone

CAL FIRE Very High Fire Hazard Severity Zone (Local Responsibility Area)

CAL FIRE Fire Hazard Severity Zones (State Responsibility Area)

Moderate

High

Very High

N

0 0.5 1

Miles

Sources: City of Oakland; CAL FIRE

Horizon WATER and ENVIRONMENT

Figure 3.14-1 Fire Hazard Severity Zones

Vegetation Management Plan
Draft Environmental Impact Report

a. Appropriate fire-suppression equipment must be maintained from April 1 to December 1, the highest-danger period for fires (Pub. Res. Code Section 4428).

b. On days when a burning permit is required, flammable materials must be removed to a distance of 10 feet from any equipment that could produce a spark, fire, or flame, and the construction contractor must maintain the appropriate fire-suppression equipment (Pub. Res. Code Section 4427).

c. On days when a burning permit is required, portable tools powered by gasoline-fueled internal combustion engines must not be used within 25 feet of any flammable materials (Pub. Res. Code Section 4431).

Local Laws, Regulations, and Policies

City of Oakland General Plan

The following policies and objectives from the City of Oakland General Plan Open Space, Conservation, and Recreation Element are relevant to the VMP:

- **Objective CO-10: Vegetation Management** – To manage vegetation so that the risk of catastrophic wildfire is minimized.
    - **Policy CO-10.1: Flammable Vegetation Control –** Subject to the availability of City resources and at the discretion of the City Council and applicable City departments, control flammable vegetation on public and private open space lands in the Oakland Hills to reduce wildfire hazard.
    - **Policy CO-10.2: Fire Prevention Measures** – As determined necessary by the City, require individual property owners and developers in high hazard areas to reduce fire hazards on their properties through a range of preventative measures. Landscaping and site planning in these high hazard areas should minimize future wildfire hazards.

The following policy from Chapter 4, Fire Hazards, of the Safety Element is also relevant to the VMP:

- **Policy FI-3:** Prioritize the reduction of the wildfire hazard, with an emphasis on prevention.

Oakland Fire Code

Oakland Municipal Code Chapter 15.12 (Oakland Fire Code) and its amendments establish regulations regarding the hazard of fire and explosion arising from the storage, handling, or use of structures, materials or devices; conditions hazardous to life, property or public welfare in the occupancy of structures, or premises; fire hazards in the structure or on the premises from occupancy or operation; matters related to fire suppression or alarm systems; and conditions affecting the safety of firefighters and emergency responders during emergency operations.

The Oakland Fire Code also includes Chapter 49 (Wildland-Urban Interface Areas), which defines the City's VHFHSZ and outlines requirements for defensible space, hazardous vegetation

management, electrical distribution line clearances, fire apparatus access, water supply, ignition source control, and combustible materials storage, among others. Specifically, Section 4906.3 of the Oakland Fire Code states that vegetation around all applicable buildings and structures within the VHFHSZ shall be maintained in accordance with California Public Resources Code Section 4291, California Code of Regulations Title 14 – Natural Resources, Division 1.5 – Department of Forestry and Fire Protection, "General Guideline to Create Defensible Space," and California Government Code Section 51182.

North Oakland Hill Area Specific Plan

The North Oakland Hill Area Specific Plan (City of Oakland 1986) is a document addressing land use, infrastructure, zoning, and development in a portion of the Oakland hills. The area covered by this specific plan is generally located along the ridgeline northwest of Shepherd Canyon Road. This specific plan includes a vegetation management prescription and specific policies and mitigation measures to reduce fire hazard risk within the North Oakland hill area. The approach and goals addressed by these policies and mitigation measures have, in many cases, been incorporated into the City's General Plan and elements of the Draft VMP.

3.14.3 Impact Analysis

Methodology

This impact analysis considers whether implementation of the VMP would result in significant adverse impacts related to wildfires. The analysis focuses on reasonably foreseeable effects of the VMP as compared with baseline conditions. The potential direct and indirect effects of the VMP are described and evaluated according to significance criteria from Appendix G of the CEQA Guidelines (below).

Criteria for Determining Significance

Based on Appendix G of the CEQA Guidelines, if the VMP area is located near state responsibility areas or lands classified as very high fire severity zones, the VMP would result in a significant impact related to wildfire if it would:

- Substantially impair an adopted emergency response plan or emergency evacuation plan;
- Exacerbate wildfire risks and thereby expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire due to slope, prevailing winds, and other factors;
- Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment; or
- Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes.

Issues Not Evaluated Further

Criteria that are dismissed from the analysis include:

- **Substantial Impairment of Adopted Emergency Response Plan or Emergency Evacuation Plan**. This topic is addressed in Section 3.8, "Hazards and Hazardous Materials," and Section 3.12, "Transportation."

- **Require the Installation or Maintenance of Infrastructure that May Exacerbate Fire Risk.** While the VMP involves installation or maintenance of fuel breaks, the temporary and ongoing impacts associated with this activity are described throughout Chapter 3 of this EIR. The VMP does not involve installation or maintenance of roads, emergency water sources, power line or other utilities that may exacerbate wildfire risks or ongoing impacts to the environment.

Environmental Impacts

Impact WLD-1: Substantially Exacerbate Wildfire Risk and Expose People to Uncontrolled Spread of a Wildfire (*Less than Significant with Mitigation*)

The VMP was developed to meet the goals of reducing wildfire hazard on City-owned land and along critical access/egress routes, reducing the likelihood of ignitions and extreme fire behavior to enhance public and firefighter safety, avoiding or minimizing impacts to natural resources, and contributing to regional efforts to reduce wildfire hazard in the Oakland Hills. VMP activities would not involve placement of people or habitable structures in areas without adequate fire protection. Additionally, VMP activities would not result in the creation of new wildland areas which could increase fire dangers.

The VMP area is one of the highest risk areas in the country for devastating WUI fires, due to factors such as local extreme wind and weather events, topography, and vegetation types. It is also the location of the 1991 Tunnel Fire, one of the state's most destructive historic wildfires. Implementation of the VMP would reduce fuel load and fire risk in the VHFHSV through the targeted vegetation management activities described in Chapter 2, and would thus help protect people, structures, and habitat from wildfire risks.

Because certain VMP activities (e.g., mechanical treatment techniques) would be conducted during the dry summer months when fire danger is the highest, there is a potential for an accidental ignition of a wildland fire during implementation of VMP activities. Use of vehicles and equipment for implementation of VMP projects could ignite a fire through generation of sparks or heat. Accidental ignition of a wildfire would be considered a significant impact. This potential is temporary and limited to periods when VMP activities are being implemented. In the long-term, the VMP will reduce wildfire risk.

Implementation of **Mitigation Measure HAZ-1 (Vehicle and Equipment Maintenance)** and **Mitigation Measure WLD-1 (Fire Prevention)** would reduce potential impacts, by requiring on-site fire suppression equipment, spark arrestors on all equipment with internal combustion engines, restricting activities on high fire danger days, and require that all equipment and vehicles are checked for leaking oil and fluids.

Mitigation Measures

Mitigation Measure HAZ-1: Vehicle and Equipment Maintenance (VMP BMP GEN-8)

See text in Section 3.8, "Hazards and Hazardous Materials."

Mitigation Measure WLD-1: Fire Prevention

The City and its contractors shall implement the following measures:

- All vegetation management and portable equipment with internal combustion engines shall be equipped with spark arrestors.
- Work crews shall not conduct vegetation treatment activities during Red Flag Day and Fire Weather Watch warnings, except in the case of emergency.
- During the high fire danger period (April 1–December 1), work crews shall:
  - Have appropriate fire suppression equipment available at the work site.
  - Keep flammable materials, including flammable vegetation slash, at least 10 feet away from any equipment that could produce a spark, fire, or flame.
  - Not use portable tools powered by gasoline-fueled internal combustion engines within 25 feet of any flammable materials unless a round-point shovel or fire extinguisher is within immediate reach of the work crew (no more 25 feet away from the work area).

Conclusion

Although some VMP treatment projects (e.g., those involving mechanical techniques) could result in the risk of accidental ignition of a wildfire, implementation of Mitigation Measures HAZ-1 and WLD-1 would reduce these impacts to a level that is **less than significant with mitigation**. The VMP, overall, would have a beneficial effect as it would substantially reduce wildfire risks.

Impact WLD-2: Expose People or Structures to Substantial Risks Related to Post-Fire Landslides or Flooding (*Less than Significant with Mitigation*)

VMP activities would not involve placement of people or habitable structures in areas with risks related to post-wildfire flooding or landslides. Moderate to high severity wildfire can greatly increase the likelihood of debris sliding and debris flows (Haas et al. 2017). Rainstorms after wildfire can result in flash floods and debris flows, which can impact people or structures that are located below an area that has burned. Implementation of the VMP would reduce risks of fire, especially catastrophic fire, and thus reduce risk of post-fire landslides or flooding. This would be a beneficial impact compared to existing conditions.

However, implementation of some VMP treatment projects, such as those located on steep slopes, would result in increased potential for surface erosion and a low likelihood of increasing the risk of landslides due to vegetation removal. Removal of vegetation during VMP treatment projects could affect the root structure in treated areas such that the stability of slopes and soils could decrease, which would increase the risk of erosion. Removal of vegetation can also affect soil moisture content by reducing evapotranspiration, keeping more moisture in the soil. However, complete removal of vegetation in treatment areas under the VMP would not occur.

Vegetation treatments and vegetation removal activities are guided by the VMP's standards which define vegetation removal and cover densities. Vegetation treatments within the VMP area (see **Appendix A**, *Draft Vegetation Management Plan*, of this DEIR for more details) include leaving a minimum number of trees per acres in each vegetation type and guidance on spacing between retained trees. The vegetation standards of the VMP would minimize the potential for these impacts. Areas with steeper slopes and where previous landslides have occurred would be at higher risk of landslides. These issues are discussed in more detail in v Section 3.6, "Geology, Soils, and Seismicity."

The VMP covers a 10-year timeframe, and VMP projects would be spread across the landscape during that time. Thus, impacts related to landslides would be dispersed both temporally and spatially.

Mechanical Treatments

Mechanical treatments are anticipated to have the greatest potential for increasing surface erosion, slope instability and landslides, due to ground disturbance from tracked equipment. Implementation of **Mitigation Measure GEO-1 (Minimize Soil Disturbance)** and **Mitigation Measure GEO-2 (Erosion and Sediment Control Measures)** would minimize the potential for landslides by minimizing the area of ground disturbance and implementing erosion control BMP to stabilize slopes. Implementation of **Mitigation Measure GEO-3 (Geotechnical Evaluation**) would reduce the potential for landslides by requiring a geotechnical evaluation that considers the potential for future landslides associated with VMP treatments in areas where landslide potential is increased.

Hand Labor Treatments

Hand labor treatments are anticipated to have low impacts on the potential for surface erosion and landslides, due to the minimal potential for ground disturbance. However, implementation of Mitigation Measures GEO-1 and GEO-2 would further minimize the potential for landslides by minimizing the area of ground disturbance and implementing erosion control BMP to stabilize slopes.

Grazing

Grazing treatments are anticipated to have a low impact on the potential for surface erosion and landslides.

Herbicides

Herbicide treatments are anticipated to have a low impact on the potential for surface erosion and landslides, due to the minimal potential for ground disturbance.

Mitigation Measures

Mitigation Measure GEO-1: Minimize Soil Disturbance (VMP BMP GEN-2)

See text in Section 3.6, "Geology, Soils, and Seismicity."

Mitigation Measure GEO-2: Erosion and Sediment Control Measures (VMP BMP GEN-3)

See text in Section 3.6, "Geology, Soils, and Seismicity."

Mitigation Measure GEO-3: Geotechnical Evaluation

See text in Section 3.6, "Geology, Soils, and Seismicity."

Conclusion

While some proposed VMP treatment projects would incrementally increase the potential for surface erosion and landslides and associated flooding (particularly in steep areas), implementation of Mitigation Measures GEO-1, GEO-2, and GEO-3 would reduce potential risks related to post-fire landslides or flooding to a level that is **less than significant with mitigation**. The VMP, overall, would have a beneficial effect as it would substantially reduce wildfire risks and thereby reduce the potential for post-fire surface erosion, landslides, and flooding.