

4.6 GEOLOGY AND SOILS

4.6.1 Introduction

This section addresses the potential impacts of the project with respect to geology and soils, as well as mineral and paleontological resources. It describes the existing geologic conditions of the project area and identifies applicable federal, state, and local plans, policies, laws, and regulations. The analysis evaluates potential impacts of the project, including cumulative impacts, related to soil and geologic stability, loss of mineral resource availability, and loss of significant paleontological resources. The analysis identifies mitigation measures, when available, to reduce the level of impact to less than significant. Changes in deposition, erosion, or siltation that may modify the channel of a river, stream, or lake are discussed in Section 4.9, “Hydrology and Water Quality.”

Important terms for specific parts of the project are discussed in detail in Section 4.0, “Approach to the Environmental Analysis.” The following brief discussion is intended to remind the reader how those terms are defined and used in the EIR analysis, including this section. “SAP area” refers to the entire SAP area, which includes the PRSP area. “Net SAP area” refers to the portion of the SAP area outside the PRSP area. The “project” encompasses the entirety of the SAP, including the PRSP and all associated off-site improvements. “Project area” refers to the entire area covered by the project. Because the project area is composed of three pieces (the net SAP area, the PRSP area, and areas where other off-site infrastructure would support the project), the impact analysis typically is divided into three subsections: “Net SAP Area,” “PRSP Area,” and “Other Supporting Infrastructure.” (“Other Supporting Infrastructure” refers to improvements outside the SAP area and is divided into “Pleasant Grove Retention Facility” and “Off-Site Transportation and Utility Improvements.”) Some required infrastructure improvements are planned outside the PRSP area but still in the SAP area; those improvements are addressed in the “PRSP Area” sections.

Seismic hazards are not discussed in this section. The project is not located in an area that is typically subject to strong seismic activity. The County’s General Plan EIR states that the western and central parts of the county generally have low seismicity (Placer County 1994a). Also, implementation of the project would conform to the current California Building Standards Code (CBC), which contains specifications to minimize adverse effects on structures caused by ground shaking from earthquakes and to minimize secondary seismic hazards (i.e., ground lurching, liquefaction). Thus, through conformance with the CBC and implementation of site-specific engineering measures developed in compliance with these codes, implementing the project would not result in exposure of people or structures to substantial adverse effects related to seismic hazards, nor would implementing the project have the potential to exacerbate these hazards.

Unstable geologic units or soils, including those susceptible to landslide, subsidence, collapse, or compaction, are not discussed in this section. Mass wasting (e.g., landslides) is uncommon to the project area because of the relatively flat topography and gently undulating terrain. The U.S. Geological Survey (USGS), which monitors historical and current subsidence, does not identify subsidence in the project area (USGS 2017). Furthermore, implementation of the project would conform to the current CBC, which contains specifications to minimize adverse effects on structures caused by unstable soils. For example, buildings on or adjacent to slopes must follow specifications regarding building clearance from ascending slopes, foundation setbacks, and foundation elevation. The CBC also contains guidance for installation of deep foundations through unstable soils.

The project area is relatively flat and does not contain unique geologic or physical features. No activities that would level off hilltops or create deep cuts into hillsides are proposed. Therefore, implementing the project would not substantially change the topography or ground surface relief features, nor would it result in the destruction, covering, or modification of unique geologic or physical features. These impacts are not discussed further in this section.

Impacts related to septic systems are not discussed in this section. Sanitary sewer service would be provided to development within the project area by both Placer County and the South Placer Wastewater Authority. No septic systems or alternative wastewater disposal systems are proposed or present on-site.

No comments regarding geology and soils or mineral and paleontological resources were received during the NOP public comment period.

As discussed in Chapter 1, "Introduction," the PRSP land use plan has been slightly revised since circulation of the NOP. Changes primarily relate to increasing the distance between the landfill property and land designated for residential uses, modifying the density of proposed residential areas, reducing the proposed commercial intensity, slightly decreasing the acreage of open space, and increasing the acreage of parks to meet County parkland provision standards. The size of the PRSP area (2,213 acres) has not changed since release of the NOP, and the overall area of development would be nearly identical. Impacts associated with geology and soils relate primarily to ground disturbance. Because the changes to the PRSP land use plan would be consistent with the overall level of ground disturbance associated with the previous PRSP land use plan, and because the changes to the PRSP land use plan would not substantially change the locations in which ground disturbance would occur, potential impacts on geology and soils resulting from the land use plan identified in the NOP and the current land use plan analyzed in this EIR are essentially the same.

4.6.2 Environmental Setting

GEOLOGY

Regional Geology

The project area is within the Great Valley geomorphic province, a northwest-trending alluvial plain about 50 miles wide and 400 miles long, bounded by the Coast Ranges on the west and the Sierra Nevada on the east. It is drained by the Sacramento and San Joaquin Rivers, which join and enter San Francisco Bay. To the north, the Sacramento Valley floodplain is interrupted by the Sutter Buttes, an isolated Plio-Pleistocene volcanic plug. The Great Valley is filled with alluvial sediments derived from the Sierra Nevada and Coast Ranges that can be 20,000–40,000 feet thick. Beneath the valley, Cretaceous and Cenozoic strata form a broad U-shaped cross-sectional trough that is steeper on the west than the east (CGS 2015).

SAP Area Geological Conditions

The SAP area is principally underlain by Pleistocene nonmarine sedimentary deposits formed during the Cenozoic period. Sedimentary units that are present in the area are as follows:

- ▲ Quaternary Period Turlock Lake Formation: arkosic alluvium, sand with some silt, and minor gravel; deeply weathered and dissected;
- ▲ Quaternary Period Riverbank Formation: arkosic alluvium, sand with some silt, forming alluvial terraces, and dissected alluvial fans along streams on the southeastern side of the Sacramento Valley;
- ▲ Tertiary Period Mehrten Formation: undivided mudstone, claystone, siltstone, minor sandstone and conglomerate, and tuff breccia derived from andesitic volcanic source areas near the crest of the Sierra Nevada; and
- ▲ Quaternary Alluvium: undivided alluvium consisting of flat, relatively undissected fan, terrace, basin deposits, and small active streams.

Although most of the SAP area consists of the Turlock Lake Formation, a small pocket in the northeastern corner consists of the Riverbank Formation, the eastern side consists of the Mehrten Formation, and a small

pocket in the southwestern corner consists of Quaternary Alluvium (Wagner et al. 1981; Gutierrez 2011; Lawler 2004).

PRSP Area Geological Conditions

The PRSP area is composed of three distinct geologic units. Most of the PRSP area is underlain by the partially consolidated sand, silt, and gravel of the Turlock Lake Formation. The southwestern corner is underlain by Quaternary Alluvium, and the Riverbank Formation occurs only in a surface outcrop in the southeasternmost portion of the PRSP area (Lawler 2004).

Geological Conditions in Other Supporting Infrastructure Areas

The Pleasant Grove Retention Facility site is primarily underlain by the Riverbank Formation. A small portion of the northwestern corner of the site is underlain by the Turlock Lake Formation (Wagner et al. 1981). Geologic conditions near other facilities proposed outside the SAP area include land that is currently developed (where roadway widening and utility pipelines are proposed within existing paved roadways) and undeveloped land that includes primarily the same geologic units as the SAP area.

TOPOGRAPHY

Regional Topography

The Great Valley geomorphic province is characterized by low-lying ridges and valleys separated by streams. The most prominent topographic feature throughout the Sacramento Valley is the Sutter Buttes, an ancient volcanic remnant that rises about 1,980 feet above the valley and lies about 30 miles northwest of the project area. Other significant features include the Coast Ranges, west of the project area, and the Sierra Nevada, east of the project area.

SAP Area Topography

The SAP area contains gently rolling topography and rounded knolls and ridges that are separated by intermittent streams. The entire region slopes gently westward toward the Sacramento River, with SAP area elevation ranging from approximately 75 feet to 195 feet above mean sea level (msl).

PRSP Area Topography

The topography of the PRSP area is dominated by a series of highly dissected alluvial fans that emanate from a horseshoe-shaped ridge located north, south, and east of the PRSP area. Intermittent streams dissecting the ridge drain water to the central and southwestern portions of the area. Detailed descriptions of site drainages can be found in Section 4.9, "Hydrology and Water Quality." The low-lying portion in the center of the ridge consists of a moderately wide valley containing a meandering stream. The relatively flat-lying tops of the ridges represent alluvial fan lobes that vary in elevation from 143 feet in the northeastern portion of the area to 115 feet in the central and eastern portions. Site elevations range from approximately 143 feet above msl near the northeastern PRSP area boundary to approximately 90 feet msl near the southwestern corner (Wallace-Kuhl & Associates 2004).

Topography in Other Supporting Infrastructure Areas

The topography of the Pleasant Grove Retention Facility site and the off-site transportation and utility improvement areas is generally flat, similar to the topography in the PRSP area.

SOILS

Regional Soils

The *Soil Survey of Placer County, Western Part* (USDA 1980) shows five soil types in the region. The soils occurring in this area are classified as either those that form on terraces, such as the San Joaquin-Cometa, Fiddyment-Cometa-Kaseberg, Cometa-Ramona, and Redding-Corning, or those that form on alluvial bottoms,

such as the Xerofluvents-Kilaga-Ramona. Terrace soils are generally well drained, are moderately deep to very deep, and have a sandy loam or loam subsurface layer and a dense clay subsoil. Soils forming on the alluvial bottoms are nearly level, very deep, and well drained to somewhat poorly drained.

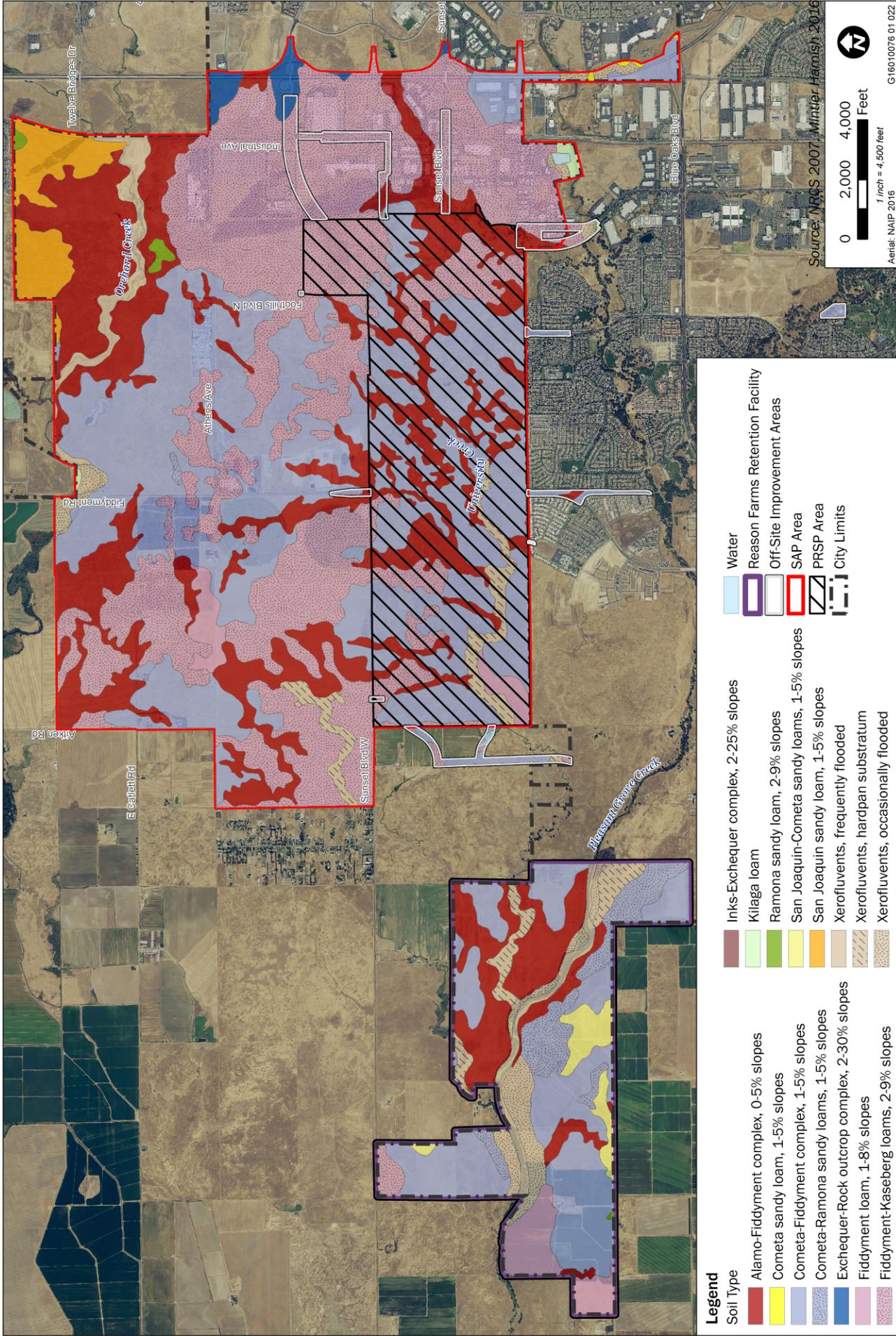
SAP Area Soils

The Natural Resources Conservation Service (NRCS) Web Soil Survey indicates that the soils types listed in Table 4.6-1 and shown in Exhibit 4.6-1 are mapped across the SAP area. Table 4.6-1 describes the soil types and soil qualities, including erosion potential and linear extensibility (shrink-swell potential).

Table 4.6-1 Soil Types in the SAP Area

Soil Type	Description	Water Erosion Potential	Linear Extensibility
Fiddymt-Kaseberg loams, 2-9% slopes	This map unit consists of approximately 50% Fiddymt soil and 30% Kaseberg soil. Fiddymt soil is well drained and consists of alluvium derived from siltstone. Kaseberg soils are well drained.	Moderate	Low
Cometa-Fiddymt complex, 1-5% slopes	This map unit consists of approximately 35% Cometa soil and 35% Fiddymt soil. Cometa soils are well drained.	Severe	Low
Alamo-Fiddymt complex, 0-5% slopes	This map unit consists of approximately 50% Alamo soil and 30% Fiddymt soil. Alamo soils are poorly drained.	Slight	High
San Joaquin sandy loam, 1-5% slopes	The San Joaquin component makes up 80% of the map unit. It is well drained.	Moderate	Low
Xerofluvents, hardpan substratum	The Xerofluvents component makes up 85% of the map unit. This map unit occurs in small areas of somewhat poorly drained loamy alluvium in minor drainageways on terraces.	Slight	Low
Xerofluvents, frequently flooded	The Xerofluvents, frequently flooded component makes up 90% of the map unit. This map unit occurs in narrow stringers of somewhat poorly drained recent alluvium adjacent to stream channels.	Moderate	Moderate
Fiddymt loam, 1-8% slopes	The Fiddymt component makes up 85% of the map unit.	Severe	Low
Exchequer-Rock outcrop complex, 2-30% slopes	The Exchequer component makes up 60% of the map unit. It is a shallow, somewhat excessively drained soil underlain by hard andesitic breccia.	Slight	Low
Xerofluvents, occasionally flooded	The Xerofluvents, occasionally flooded component makes up 90% of the map unit. This map unit occurs in small areas of well-drained loamy alluvium adjacent to stream channels.	Moderate	Moderate
Ramona sandy loam, 2-9% slopes	The Ramona component makes up 85% of the map unit. It is a very deep, well-drained soil underlain by stratified granitic sediment.	Moderate	Low
Kilaga loam	The Kilaga component makes up 80% of the map unit. It is a very deep, well-drained soil underlain by mixed alluvium.	Moderate	Low
Cometa-Ramona sandy loams, 1-5% slopes	This map unit consists of approximately 50% Cometa soil and 30% Ramona soil.	Moderate	Low
Cometa sandy loam, 1-5% slopes	The Cometa component makes up 85% of the map unit.	Moderate	Low
Inks-Exchequer complex, 2-25% slopes	This map unit consists of approximately 40% Inks soil and 30% Exchequer soil. Inks soils are well drained.	Slight	Low

Sources: NRCS 2017a, USDA 1980



Legend

- | | | |
|--|---|---|
|  Alamo-Fiddymat complex, 0-5% slopes |  Inks-Exchequer complex, 2-25% slopes |  Water |
|  Cometa sandy loam, 1-5% slopes |  Kilaga loam |  Reason Farms Retention Facility |
|  Cometa-Fiddymat complex, 1-5% slopes |  Ramona sandy loam, 2-9% slopes |  Off-Site Improvement Areas |
|  Cometa-Ramona sandy loams, 1-5% slopes |  San Joaquin-Cometa sandy loams, 1-5% slopes |  SAP Area |
|  Exchequer-Rock outcrop complex, 2-30% slopes |  San Joaquin sandy loam, 1-5% slopes |  PRSP Area |
|  Fiddymat loam, 1-8% slopes |  Xerofluvents, frequently flooded |  City Limits |
|  Fiddymat-Kaseberg loams, 2-9% slopes |  Xerofluvents, hardpan substratum | |
| |  Xerofluvents, occasionally flooded | |

Exhibit 4.6-1

Soil Types in the Project Area



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PRSP Area Soils

One geotechnical study of the PRSP area has been conducted, and the results are presented in *A Preliminary Geotechnical Engineering Report: Placer Ranch* (Wallace-Kuhl & Associates 2004). The scope of the investigation included a site reconnaissance; a review of NRCS maps, geologic maps, historical aerial photographs, and available groundwater information; a subsurface investigation, including the excavation and sampling of 21 test pits across the PRSP area to a maximum depth of approximately 10 feet below existing site grades; and limited laboratory testing of materials excavated from trenches. The study found that surface and near-surface soils consist generally of silty clays and clayey sands within the upper 2–3 feet underlain by silty sands and variably cemented clayey and sandy silts (locally known as hardpan) to the maximum depth explored (Wallace-Kuhl & Associates 2004).

The *Soil Survey of Placer County, California, Western Part* (USDA 1980) shows five soil types occurring within the PRSP area, which are depicted in Exhibit 4.6-1. Properties of these soil types, including erosion potential and linear extensibility, are identified in Table 4.6-1, above. Detailed descriptions of these soil types are provided in Table 4.6-2.

Table 4.6-2 Soil Types in the PRSP Area

Alamo-Fiddymment complex, 0–5% slopes

These nearly level to undulating soils occur low on terraces at elevations of 50–130 feet. The unit comprises 50% Alamo soil and 30% Fiddymment soil. The remaining percentages include soil of San Joaquin sandy loam, Cometa sandy loam, and Kaseberg loam.

The Alamo soil occurs in nearly level basins and drainageways, and the Fiddymment soil is on side slopes and ridges. The Alamo soil is poorly drained clay with a moderately deep hardpan. Permeability of the soil is very slow, surface runoff is slow to ponded, and the average water table is near the surface from winter to spring. The Fiddymment soil forms in old valley fill and is well drained and moderately deep over a hardpan, which is at a depth of about 28 inches. Permeability of the soil is very slow, surface runoff is slow, and the soil may become saturated for short periods following intense rainstorms.

The Alamo-Fiddymment complex supports little construction and is primarily used for farmsteads. The major limitations to construction for the Alamo soil include wetness, slow permeability of subsurface soils, high shrink-swell potential, and the limited ability for the soil to support a load. The Fiddymment soil has engineering characteristics similar to those of the Alamo soil with the addition of a shallow depth to hardpan.

Cometa-Fiddymment complex, 1–5% slopes

These undulating soils are on low terraces and occur at elevations of 75–200 feet. The unit is approximately 35% Cometa soil and 35% Fiddymment soil. The remaining percentage includes soils of the San Joaquin sandy loam, the Kaseberg loam, and the Ramona sandy loam. The Cometa soil can be found on younger land surfaces and the Fiddymment on older surface features.

The Cometa soil is composed of a deep, well-drained claypan soil that formed on alluvium, primarily from granitic sources. Surface soils are typically brown sandy loam and are approximately 18 inches in thickness. The subsoil is brown clay and extends to a depth of about 29 inches, where it grades into a compacted very pale brown sandy loam. Permeability of the Cometa soil is very slow, and surface runoff is slow. The Fiddymment soil is described above.

The major construction limitations of the Cometa are the very slow permeability of the subsoil, high shrink-swell potential, and limited ability of the soil to support a load. The Fiddymment soil has engineering characteristics similar to those of the Cometa soil with the addition of a moderate depth to hardpan.

Fiddymment loam, 1–8% slopes

This is a moderately deep, well-drained soil found on low terraces overlying siltstone at elevations of 75–135 feet. The Fiddymment loam is mainly composed of Fiddymment soil and about 15% of a combination of the Kaseberg loam, Cometa sand, San Joaquin sandy loam, and Alamo clay, which occurs in some drainageways and basins. The Fiddymment soil is described above.

Some areas of the Fiddymment loam are used for rural subdivisions. The major limitations of the unit include slow permeability of the subsoil, the moderate depth to the hardpan, and the limited ability of the soil to support a load.

Fiddymment-Kaseberg loams, 2–9% slopes

This unit is undulating to gently rolling and overlies terraces with elevations of 75–135 feet. The unit is composed of 50% Fiddymment soil and 30% Kaseberg soil. The remaining percentages include Alamo clay, which can be found in areas with swales and drainageways.

The Fiddymment soil is described above. The Kaseberg soil is a well-drained soil that is shallow and overlying a hardpan. These soils typically formed in old valley fill overlying siltstone. The surface layer is light brownish gray loam with yellowish brown mottles and is about 8 inches thick. The subsoil consists of light gray silt loam, which, at a depth of approximately 16 inches, overlies a silica-indurated hardpan.

Table 4.6-2 Soil Types in the PRSP Area

The Fiddymt-Kaseberg loam supports little construction with the exception of farmsteads. Engineering limitations of the soil include very slow permeability of the subsoil, moderate depth to the hardpan and underlying siltstone, and the limited ability of the soil to support a load.

Xerofluvents, hardpan substratum

This unit is composed of small areas of loamy alluvium found in minor drainageways on terraces. These soils are somewhat poorly drained with permeability being moderately slow. The water table can rise to within 20 inches of the surface during the rainy winter months. These soils can sometimes be flooded by streams that overflow during large storm events.

Sources: NRCS 2017b; USDA 1980

Soils in Other Supporting Infrastructure Areas

The NRCS Web Soil Survey indicates that the Pleasant Grove Retention Facility site has the soil types listed in Table 4.6-3 and shown in Exhibit 4.6-1. Table 4.6-3 describes the soil types and soil qualities, including erosion potential and linear extensibility. Other supporting infrastructure areas include land that is currently developed (where roadway widening and utility pipelines are proposed within existing paved roadways) and undeveloped land that includes primarily the same soil types as the SAP area.

Table 4.6-3 Soil Types in Other Supporting Infrastructure Areas

Soil Type	Description	Water Erosion Potential	Linear Extensibility
Pleasant Grove Retention Facility			
Cometa-Fiddymt complex, 1–5% slopes	This map unit consists of approximately 35% Cometa soil and 35% Fiddymt soil. Cometa soils are well drained.	Severe	Low
Alamo-Fiddymt complex, 0–5% slopes	This map unit consists of approximately 50% Alamo soil and 30% Fiddymt soil. Alamo soils are poorly drained.	Slight	High
Cometa-Ramona sandy loams, 1–5% slopes	This map unit consists of approximately 50% Cometa soil and 30% Ramona soil.	Moderate	Low
Fiddymt loam, 1–8% slopes	The Fiddymt component makes up 85% of the map unit.	Severe	Low
Xerofluvents, occasionally flooded	The Xerofluvents, occasionally flooded component makes up 90% of the map unit. This map unit occurs in small areas of well-drained loamy alluvium adjacent to stream channels.	Moderate	Moderate
Xerofluvents, hardpan substratum	The Xerofluvents component makes up 85% of the map unit. This map unit occurs in small areas of somewhat poorly drained loamy alluvium in minor drainageways on terraces.	Slight	Low
San Joaquin-Cometa sandy loams, 1–5% slopes	This map unit consists of approximately 40% San Joaquin soil and 30% Cometa soil. San Joaquin and Cometa soils are well-drained claypan soils.	Moderate	Low
Xerofluvents, frequently flooded	The Xerofluvents, frequently flooded component makes up 90% of the map unit. This map unit occurs in narrow stringers of somewhat poorly drained recent alluvium adjacent to stream channels.	Moderate	Moderate
Fiddymt-Kaseberg loams, 2–9% slopes	This map unit consists of approximately 50% Fiddymt soil and 30% Kaseberg soil. Fiddymt soil is well drained and consists of alluvium derived from siltstone. Kaseberg soils are well drained.	Moderate	Low
Ramona sandy loam, 2–9% slopes	The Ramona component makes up 85% of the map unit. It is a very deep, well-drained soil underlain by stratified granitic sediment.	Moderate	Low

Sources: NRCS 2017c; USDA 1980

EROSION POTENTIAL

Erosion is the process by which surface soils are detached and transported by water and wind. Erosion has a detrimental effect on soil productivity because erosion begins with the upper horizons of a soil profile, which contain organic matter and microbial communities vital to supporting plant growth. Factors that influence the erosion potential of a soil include vegetative cover; soil properties, such as soil texture, structure, rock fragments, and depth; steepness and slope length; and climatic factors, such as the amount and intensity of precipitation.

NRCS provides an erosion potential rating based on slope and soil erosion factors (K value). Soils high in clay have low K values, about 0.05 to 0.15, because they are resistant to detachment. Coarse-textured soils, such as sandy soils, also have low K values, about 0.05 to 0.2, because they produce low runoff even though these soils are easily detached. Medium-textured soils, such as the silt loam soils, have moderate K values, about 0.25 to 0.4, because they are moderately susceptible to detachment and they produce moderate runoff. Soils having a high silt content are the most erodible of all soils; they are easily detached, tend to crust, and produce high rates of runoff. K values for these soils tend to be greater than 0.4.

Erosion hazard is described as “slight,” “moderate,” “severe,” or “very severe.” A rating of “slight” indicates that erosion is unlikely under ordinary conditions; “moderate” indicates that some erosion is likely and that erosion-control measures may be needed; “severe” indicates that erosion is very likely and that erosion-control measures, including revegetation of bare areas, are advised; and “very severe” indicates that significant erosion is expected, loss of soil productivity and off-site damage are likely, and erosion-control measures are costly and generally impractical. The project area is characterized by soils with slight to severe erosion potential, as shown in Tables 4.6-1 and 4.6-3.

EXPANSIVE SOILS

Expansive soils (soils with high shrink-swell potential) contain expansive clay minerals that can absorb significant amounts of water into their crystalline structure. The presence of these clay minerals makes the soil prone to large changes in volume in response to changes in water content. The quantity and type of expansive clay minerals affect the potential for the soil to expand or contract. When an expansive soil becomes wet, water is absorbed, and it increases in volume. Then, as the soil dries, it contracts and decreases in volume. This often-repeated change in volume can produce enough force and stress on buildings and other structures to damage foundations and walls.

One measure of the shrink-swell potential of soils is linear extensibility. “Linear extensibility” refers to the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state. The volume change is reported as percent change for the whole soil. The amount and type of clay minerals in the soil influence volume change. The shrink-swell potential is low if the soil has a linear extensibility of less than 3 percent, moderate if 3–6 percent, high if 6–9 percent, and very high if more than 9 percent. NRCS has prescribed linear extensibility ratings for most soil series in California. Soils in the project area exhibit a range in linear extensibility from low to high, as shown in Tables 4.6-1 and 4.6-3. Laboratory test results of near-surface soils in the PRSP area indicate that the native sandy and silty clays possess moderate to high expansion potential when tested in accordance with the ASTM D4829 test method. These soils are considered capable of exerting moderate expansion pressures on foundations and slab systems (Wallace-Kuhl & Associates 2004).

MINERAL RESOURCES

The California Geological Survey (CGS), formerly the California Department of Conservation, Division of Mines and Geology, has mapped mineral and mineral aggregate resources in Placer County (Lloyd 1995). The project area is located on lands classified Mineral Resource Zone 4 (MRZ-4), which are “areas of no known mineral occurrences where geologic information does not rule out either the presence or absence of significant mineral resources.” No areas have been identified as Aggregate Resource Areas within the

project area. The project area does not include any locally important mineral resource recovery sites that have been delineated on a local general plan, specific plan, or other land use plan (Placer County 2013). No mineral extraction operations exist in the project area (Placer County 2015), nor are lands within the project area and vicinity zoned Mineral Reserve Combining District (-MR), where mineral resource extraction is permitted (Placer County 1994b).

There is one sand and gravel pit (Collet Pit) 0.8 mile east of the project area and one former gold mining operation (New Baccarat) 2.25 miles northeast of the project area, indicating that mineral resources could be present based on geologic data (Loyd 1995). These mining operations have ceased operation and are no longer used for aggregate or gold production.

PALEONTOLOGY

Regional Paleontology

Fossil remains of prehistoric plant and animal life could be found in the sedimentary rocks and volcanic rock sedimentary materials that are present throughout west Placer County. Sediments associated with the Mehrten Formation in the Roseville area have been found to contain fossils of terrestrial vertebrates. Fossilized animal remains also may be present in caves associated with the limestone geology that can be found in the central part of the Sierra Nevada foothills (Placer County 1994a). The southern Sacramento Valley foothill region contains a diverse record of geological and biological history that spans more than 100 million years, dating from the Upper Cretaceous period. Under the combined influences of regional tectonic events (ranging from creation of the Sacramento Basin to uplift of the Coast Ranges foothill region), deposition of sedimentary sequences, and fluctuating worldwide sea level changes, fossils of marine and terrestrial organisms have accumulated to produce a significant record of prehistoric life (Lawler 2004).

SAP Area Paleontology

Paleontological resources are limited, nonrenewable resources of scientific, cultural, and educational value that are explicitly afforded protection by CEQA, specifically Appendix G. A unique paleontological site would include a known area of fossil-bearing rock strata. Paleontological resources are lithologically dependent; that is, deposition and preservation of paleontological resources are tied to the lithologic unit in which they occur. The potential for paleontological resources to be present is described as the paleontological sensitivity of a geological unit. The geologic units underlying the SAP area and their paleontological sensitivity ratings in accordance with Society of Vertebrate Paleontology guidelines (SVP 2010) are presented in Table 4.6-4. The sensitivity ratings take into account factors such as lithology and proven fossil yield.

Table 4.6-4 Paleontological Sensitivity of Geologic Units Underlying the SAP Area

Age	Formation	Lithology	Paleontological Sensitivity
Pleistocene	Turlock Lake Formation	Coarse to fine-sized sand, silt, and clay	High
Middle to late Pleistocene	Riverbank Formation	Weakly to strongly consolidated sand, gravel, silt, and clay	High
Miocene and early Pliocene	Mehrten Formation	Andesitic tuff and gravel	High
Latest Pleistocene to Holocene	Quaternary Alluvium	Unconsolidated gravel, sand, silt, and clay	High

Sources: Placer County 1994a; Lawler 2004; SVP 2010; Gutierrez 2011

Parus Consulting conducted paleontological, archaeological, and historical investigations for the SAP area. These investigations were conducted in March 2015 and included a search of the University of California Museum of Paleontology (UCMP) database on March 17, 2015, to identify the sensitivity of the SAP area for the presence of paleontological resources. A search of the UCMP paleontological resources database identified 778 paleontological resources in Placer County but did not identify any paleontological resources in the SAP area (Placer County 2015).

PRSP Area Paleontology

A paleontological assessment performed for the PRSP area (Lawler 2004) consisted of a search of the UCMP database, as well as field surveys in all areas potentially subject to disturbance within the PRSP area. The field survey method consisted of walking random pedestrian transects to inspect soil and available sedimentary exposures that exist within stream channels, irrigation ditches, and rodent burrow tailings for evidence of fossiliferous materials. The investigation focused on discerning whether sensitive fossil materials were observable in sediments of the Turlock Lake Formation, Riverbank Formation, and Quaternary Alluvium geologic units.

No vertebrate paleontological sites are known to exist within the PRSP area. However, paleontological sites do occur in similar-age rock units outside the PRSP area but within the southern Sacramento Valley region. These sites contain scientifically important vertebrate fossils of proboscidian (elephant), camel, sloth, bison (buffalo), and rodent terrestrial mammalian taxa. These geologic units and their age, lithology, and paleontological sensitivity are described in Table 4.6-4, above.

Paleontology in Other Supporting Infrastructure Areas

No paleontological resources are known to exist within the Pleasant Grove Retention Facility area (City of Roseville 2003). However, the area is underlain by the Riverbank Formation and Turlock Lake Formation, which are geologic units with high paleontological sensitivity (Wagner et al. 1981). A records search of the UCMP paleontological resources database conducted for the Pleasant Grove Retention Facility area and the off-site transportation and utility improvement areas did not identify any paleontological resources within these areas (Natural Investigations Company 2017).

4.6.3 Regulatory Setting

FEDERAL AND STATE

National Pollutant Discharge Elimination System Permit

In California, the State Water Resources Control Board administers the Clean Water Act (33 U.S. Code Section 1301 et seq.) and its associated regulations promulgated by the U.S. Environmental Protection Agency (40 CFR Section 122 et seq.) requiring the permitting of stormwater-generated pollution under the National Pollutant Discharge Elimination System (NPDES). The State Water Resources Control Board's jurisdiction is administered through nine regional water quality control boards. Under the federal Clean Water Act and the California Porter-Cologne Water Quality Control Act, an operator must obtain coverage under the General Construction Permit for any construction or demolition activity (e.g., clearing, grading, excavation) that results in a land disturbance of 1 acre or more. The General Construction Permit requires the implementation of best management practices (BMPs) to reduce sedimentation into surface waters and to control erosion. One element of compliance with the NPDES permit is preparation of a storm water pollution prevention plan (SWPPP) that addresses control of water pollution, including sediment, in runoff during construction (see Section 4.9, "Hydrology and Water Quality," for more information about the NPDES permit and SWPPPs.).

California Building Standards Code

The State of California provides minimum standards for building and structure design through the CBC (California Code of Regulations, Title 24). Where no other building codes apply, Chapter 29 regulates excavation, foundations, and retaining walls. The state earthquake protection law (California Health and Safety Code Section 19100 et seq.) requires that structures be designed to resist stresses produced by lateral forces caused by wind and earthquakes.

The CBC has been modified from the International Building Code for California conditions with more detailed or more stringent regulations. It identifies seismic factors that must be considered in structural design. Specific minimum seismic safety and structural design requirements are set forth in Chapter 16 of the CBC.

Chapter 18 of the CBC regulates the excavation of foundations and retaining walls, while Chapter 18A regulates construction on unstable soils, such as expansive soils and areas subject to liquefaction. Appendix J of the CBC regulates grading activities, including drainage and erosion control. The CBC also contains a provision that provides for a preliminary soil report to be prepared to identify “the presence of critically expansive soils or other soil problems which, if not corrected, would lead to structural defects” (CBC Chapter 18 Section 1803.1.1.1).

Surface Mining and Reclamation Act of 1975

The Surface Mining and Reclamation Act of 1975 (PRC Sections 2710–2796) provides for the classification of nonfuel mineral resources in the state to show where economically significant mineral resources occur or are likely to occur. Classification is carried out under the Mineral Land Classification Project under the direction of the State Geologist. Once lands have been classified, they may be designated by the State Mining and Geology Board as mineral-bearing areas of statewide or regional significance if they are in areas where urban expansion or other irreversible land uses may occur that could restrict or preclude future mineral extraction. Designation is intended to prevent future land use conflicts and occurs only after consultation with lead agencies and other stakeholders.

CGS developed guidelines for the classification and designation of mineral lands. These guidelines contain information on what are known as Mineral Resource Zones (MRZs), which together make up a system of classifying lands based on their economic importance. The MRZ system consists of four categories into which lands may be classified based on the degree of available knowledge about the resource, and the level of economic significance of the resource. These zones are described as follows:

- ▲ MRZ-1: areas where adequate information indicates that no significant mineral deposits are present, or where it is judged that little likelihood exists for their presence;
- ▲ MRZ-2: areas where adequate information indicates that significant mineral deposits are present, or where it is judged that a high likelihood exists for their presence;
- ▲ MRZ-3: areas containing mineral deposits for which the significance cannot be determined from available data; and
- ▲ MRZ-4: areas where available information is inadequate for assignment of any other MRZ category.

Paleontological Resources

Paleontological resources are classified as nonrenewable scientific resources and are protected by state statute (PRC Chapter 1.7, Section 5097.5, Archeological, Paleontological, and Historical Sites, and Appendix G of the State CEQA Guidelines). No state or local agencies have specific jurisdiction over paleontological resources or require a paleontological collecting permit to allow for the recovery of fossil remains discovered because of construction-related earth moving on state or private land on a project site.

LOCAL

Placer County General Plan

The *Placer County General Plan* (2013) includes the following relevant goals and policies regarding seismic and geological issues as they relate to public health and safety and natural resources:

GOAL 1.J: To encourage commercial mining operations within areas designated for such extraction, where environmental, aesthetic, and adjacent land use compatibility impacts can be adequately mitigated.

- ▲ **Policy 1.J.4:** The County shall discourage the development of incompatible land uses in areas that have been identified as having potentially significant mineral resources.

GOAL 5.D: To identify, protect, and enhance Placer County's important historical, archaeological, paleontological, and cultural sites and their contributing environment.

- ▲ **Policy 5.D.6:** The County shall require that discretionary development projects identify and protect from damage, destruction, and abuse, important historical, archaeological, paleontological, and cultural sites and their contributing environment. Such assessments shall be incorporated into a Countywide cultural resource data base, to be maintained by the Division of Museums.

GOAL 6.D: To preserve and protect the valuable vegetation resources of Placer County.

- ▲ **Policy 6.D.9:** The County shall require that development on hillsides be limited to maintain valuable natural vegetation, especially forests and open grasslands, and to control erosion.

GOAL 6.E: To preserve and enhance open space lands to maintain the natural resources of the County.

- ▲ **Policy 6.E.2:** The County shall require that new development be designed and constructed to preserve the following types of areas and features as open space to the maximum extent feasible:
 - a) High erosion hazard areas;
 - b) Scenic and trail corridors;
 - c) Streams, riparian vegetation;
 - d) Wetlands;
 - e) Significant stands of vegetation;
 - f) Wildlife corridors; and
 - g) Any areas of special ecological significance.

GOAL 8.A: To minimize the loss of life, injury, and property damage due to seismic and geological hazards.

- ▲ **Policy 8.A.1:** The County shall require the preparation of a soils engineering and geologic-seismic analysis prior to permitting development in areas prone to geological or seismic hazards (i.e., ground shaking, landslides, liquefaction, critically expansive soils, avalanche).
- ▲ **Policy 8.A.2:** The County shall require submission of a preliminary soils report, prepared by a registered civil engineer and based upon adequate test borings, for every major subdivision and for each individual lot where critically expansive soils have been identified or are expected to exist.
- ▲ **Policy 8.A.3:** The County shall prohibit the placement of habitable structures or individual sewage disposal systems on or in critically expansive soils unless suitable mitigation measures are incorporated to prevent the potential risks of these conditions.

Placer County Code of Ordinances

Placer County Code Article 15.48 contains the Grading, Erosion and Sediment Control Ordinance, enacted for the purpose of regulating grading on property within the unincorporated area of Placer County to safeguard life, limb, health, property, and public welfare; to avoid pollution to watercourses with hazardous materials, nutrients, sediment, or other earthen materials generated on or caused by surface runoff on or across the permit area; and to ensure that the intended use of a graded site is consistent with the *Placer County General Plan*, any specific plans, and applicable Placer County ordinances. The most common activities requiring a grading permit include filling or excavating more than 250 cubic yards; disturbing 10,000 square feet of vegetation on slopes of 10 percent or greater; building retaining walls that are more than 4 feet in height, as measured from the bottom of the footing to the top of the retained soil and/or supporting a surcharge; grading or conducting other construction activity with ground disturbance of 1 acre or more; grading in or adjacent to a drainage course or wetland; or grading in a floodplain.

Section 15.48.360 of the Placer County Code specifies when geotechnical investigations are required. A soil or geologic investigation report shall accompany the application in any of the following circumstances when required by the agency director:

- ▲ when the proposed grading includes a cut or fill exceeding 10 feet in depth at any point; however, for vehicular ways, a soil investigation shall not be required unless the grading includes a proposed cut or fill that exceeds 10 feet in depth and the slope of the natural ground exceeds 30 percent;
- ▲ when highly expansive soils are present; or
- ▲ in areas of known or suspected geological hazards, including landslide hazards and hazards of ground failure stemming from seismically induced ground shaking.

Placer County Land Development Manual

The *Placer County Land Development Manual* establishes minimum standards for the design and construction of development improvements. These requirements apply to the design and construction of development improvements to be dedicated to the public and/or accepted by the County for operation and maintenance, as well as improvements constructed in accordance with an agreement entered into between the County and a developer.

Placer County

The Engineering and Surveying Division (ESD) of the Placer County Community Development Resource Agency maintains policies and guidelines regarding grading, erosion control, stormwater design, inspection, and permitting. County-issued permits and plans related to earthwork and utilities that may be required within the project area include:

- ▲ grading permits,
- ▲ storm water quality plans,
- ▲ utility encroachment permits, and
- ▲ improvement plans.

The Environmental Health Services Division of the Placer County Department of Health and Human Services administers well installation/drilling and well destruction permitting within Placer County.

4.6.4 Analysis, Impacts, and Mitigation

STANDARDS OF SIGNIFICANCE

Under the Placer County CEQA Checklist and Appendix G of the State CEQA Guidelines, implementing the project would result in a potentially significant geologic, mineral, or paleontological resources impact if it would:

- ▲ result in any significant increase in wind or water erosion of soils, either on or off the site;
- ▲ be located on expansive soils, as defined in Chapter 18 of the California Building Code, creating substantial risks to life or property;
- ▲ result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state;
- ▲ result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan; or
- ▲ directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.

METHODS AND APPROACH

The following impact analysis is based on a review of USGS and CGS technical maps and guides, the NRCS Soil Survey, previous EIRs, background reports prepared for nearby plans and projects, and published geologic literature. Technical reports prepared for the area, including *Preliminary Geotechnical Engineering Report: Placer Ranch* (Wallace-Kuhl & Associates 2004) and *Paleontological Resources Technical Report: Placer Ranch Project* (Lawler 2004), were also reviewed for this analysis. In determining the level of significance, the analysis assumes that the project would comply with relevant laws, regulations, and guidelines.

PROPOSED SUNSET AREA PLAN GOALS, OBJECTIVES, AND POLICIES

The SAP contains the following policies relevant to geology and soils, as well as mineral and paleontological resources:

- ▲ **Policy LU/ED-3.4: Land Alteration.** The County shall require that new discretionary development comply with the Placer County Grading Ordinance as well as incorporate sound soil conservation practices and minimize land alterations. Land alterations should comply with the following guidelines:
 - a) Limit cuts and fills;
 - b) Limit grading to the smallest practical area of land;
 - c) Limit land disturbance and grading activities to the shortest practical amount of time;
 - d) Replant and stabilize graded areas to ensure establishment of plant cover before the next rainy season; and
 - e) Create grading contours that blend with the natural contours on site or with contours on property immediately adjacent to the area of development.
- ▲ **Policy NR-3.4: Stream Corridor Natural Conditions.** Where practical, the County shall require that stream corridors be preserved in open, natural conditions. The County considers uses such as road crossings, recreation trails, foot bridges, and passive parks to be compatible uses within open space areas.
- ▲ **Policy NR-3.5: Stream Protection Best Management Practices and Low Impact Development.** The County shall continue to require the use of feasible and practical best management practices (BMPs) and Low Impact Development (LID) strategies (strategies that promote natural movement of stormwater through preservation and recreation of natural landscape features and minimization of impervious surfaces) to protect streams from the adverse effects of construction activities and urban runoff and to encourage the use of BMPs for agricultural activities. The County shall require that LID strategies be incorporated into project design. These LID strategies will be focused on minimizing adverse effects on water quality and surface water runoff.
- ▲ **Policy NR-3.7: Grading After October 15th.** The County shall discourage grading activities between October 15th and April 30th, unless such activities are adequately mitigated to avoid impacts during the rainy season, including but not limited to stream sedimentation and riparian habitat damage.
- ▲ **Policy NR-3.9: NPDES Compliance.** The County shall require that new development applicants demonstrate to both the County and the Central Valley Regional Water Quality Control Board (CVRWQCB) complete compliance with the provisions of a General Construction Storm Water Discharge NPDES permit authorized and approved by the CVRWQCB, if required for development. Compliance may include a written detailed Storm Water Pollution Prevention Plan (SWPPP) and Monitoring Program (required by the NPDES permit). If appropriate to the individual project, the applicant shall demonstrate to the County and the CVRWQCB that the required Water Quality Certification has been approved by the CVRWQCB and

that the appropriate Best Management Practices for control of erosion and sedimentation will be incorporated into construction activities.

- ▲ **Policy NR-4.4: Minimal Disturbance of Natural Resources.** Where significant open space resources exist, the County shall require development to minimize disturbance to natural terrain and vegetation and to maximize natural beauty and open space.
- ▲ **Policy CR-1-6: Minimize Cultural Resource Impacts.** The County shall require that discretionary development projects are designed to avoid potential impacts to significant cultural resources whenever possible. Determinations of impacts, significance, and mitigation shall be made by qualified archaeological, historical, or paleontological consultants (in consultation with recognized local Native American groups), depending on the type of resource in question.
 - a) If archaeological resources eligible for inclusion in the NRHP [National Register of Historic Places] or CRHR [California Register of Historical Resources] are identified, an assessment of project impacts on these resources as well as detailed measures to avoid or minimize impacts to these resources will be included in an evaluation report. These measures could include project redesign, construction monitoring by a qualified archaeologist, avoidance of sites, preservation in place, or data recovery. These measures shall be developed and implemented in coordination with the Placer County Planning Services Division and Native American representatives, as appropriate.
 - b) If historical resources eligible for inclusion in the NRHP or CRHR are identified, an assessment of project impacts on these resources will be included in an evaluation report that also will identify detailed measures to avoid impacts. If avoidance of a significant architectural/built environment resource is not feasible, additional mitigation options include specific design plans for historic districts or plans for alteration or adaptive reuse of a historical resource that follows the Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring & Reconstructing Historic Buildings. If a significant historic building or structure is proposed for major alteration or renovation, or to be moved and/or demolished, a qualified architectural historian shall be retained to thoroughly document the structure and associated landscaping and setting. Documentation shall include still and video photography and a written documentary record of the building to the standards of the Historic American Building Survey or Historic American Engineering Record, including accurate scaled mapping, architectural descriptions, and scaled architectural plans, if available. The record shall be accompanied by a report containing site-specific history and appropriate contextual information. This information shall be gathered through site-specific and comparative archival research and through oral history collection as appropriate.
- ▲ **Policy CR-1.7: Discovery of Cultural Resources During Construction.** The County shall require all new development to suspend construction activities and contact the County when any cultural resources (e.g., shell, artifacts, architectural remains, significant paleontological resources) are discovered. In the event archaeological, historical, or paleontological resources are discovered, the County shall retain a qualified cultural resources specialist or paleontologist to assess the finds and develop mitigation measures for the protection, recordation, or removal of the cultural resources or paleontological resources. These measures may also include consultation with local Native American communities and the Native American Heritage Commission on the cultural find, if warranted. If the appropriate specialist determines that the find does not meet standards of significance for cultural resources (as defined in the State CEQA Guidelines Section 15064.5), construction may proceed. If the appropriate specialist determines that the find does meet the standards of significance for cultural resources, SAP Policy CR-1.6, Minimize Cultural Resource Impacts, shall be implemented.
- ▲ **Policy HS-5.1: Soils Engineering Analysis.** The County shall require the preparation of a soils engineering analysis for new discretionary development in areas prone to geological hazards and the integration of the recommendations of the analysis into project design.

- ▲ **Policy HS-5.2: Preliminary Soils Report.** Where critically expansive or unstable soils have been previously identified or are expected to exist for new discretionary development projects, the County shall require that the recommendations of a preliminary soils report, prepared by a registered civil engineer, be implemented as a condition of approval. The County shall further require that project design account for the findings of the report.

PROPOSED PLACER RANCH SPECIFIC PLAN DEVELOPMENT STANDARDS

The PRSP and the PRSP Development Standards require the following protective measures that reduce erosion potential:

- ▲ **Active Construction Stormwater Management.** For active construction projects, a Storm Water Pollution Prevention Plan (SWPPP) is required to manage the release of on-site stormwater runoff. It addresses how stormwater from a construction site is managed and treated before being discharged from the site.
- ▲ **Post Construction Stormwater Management.** To manage stormwater quality and reduce post-development stormwater flows, development in the PRSP is required to utilize various Low Impact Development (LID) strategies, consistent with the West Placer Storm Water Quality Design Manual.
- ▲ **OS [Open Space] Development Standards.** Site disturbance and activity shall be as permitted in the PRSP Open Space Long Term Management Plan (LTMP). The LTMP contains regulations for fire/fuel modification zones, mowing activities, grading and construction activities, pedestrian and bikeway paths, storm drainage systems (including outfall locations and the treatment and transfer of stormwater to receiving waters), utility crossings, and other permitted activities.

IMPACTS AND MITIGATION MEASURES

In each impact discussion below, multiple elements of the project are evaluated for potential environmental effects. Some elements may have a different level of significance than other elements for the same impact topic. For example, effects from development of the PRSP area may have a less-than-significant impact in one area (e.g., soil erosion), whereas development of other supporting infrastructure, such as the Pleasant Grove Retention Facility, may have a significant impact. Because each individual project element is part of the overall project, one final conclusion is presented for each impact. Because all elements that make up the project are grouped together for the ultimate impact conclusion, the conclusion reflects the most significant impact conclusion of all elements analyzed. Therefore, if one element of the project would have a significant and unavoidable impact, the impact is identified as significant and unavoidable for the overall project.

Impact 4.6-1: Result in substantial soil erosion

Construction associated with the project would involve clearing and grading in areas where new structures or other facilities would be built and trenching for placement of utility connections. This would temporarily expose soils previously protected by vegetation to the effects of wind and water erosion. Proponents of individual development projects within the SAP area would comply with the state CBC and federal NPDES program and would implement BMPs for stream protection in accordance with *Placer County General Plan Policy NR-3.5* and fugitive dust control measures identified by the Placer County Air Pollution Control District. Compliance with the Placer County Grading, Erosion and Sediment Control Ordinance and Placer County Land Development Manual would be required for all projects within the SAP area. Similar City of Roseville protections would be required for other supporting infrastructure improvements outside the SAP area. However, given the size of the project area and the extent of ground-disturbing activities that could occur as a result of the project, substantial on- or off-site soil erosion could occur. This impact would be **potentially significant**.

Net SAP Area

Construction of individual projects implemented under the SAP would involve clearing and grading in areas where new structures and other facilities (e.g., roadways, sidewalks, trails, and stormwater facilities) would

be built and trenching for placement of utility connections. This would temporarily expose soils previously protected by vegetation to the effects of wind and water erosion. During dry months, wind can move dry soil particles into the air, creating fugitive dust emissions. Water as surface runoff may erode topsoil during precipitation events. As shown in Table 4.6-1, some soils in the net SAP area are susceptible to erosion and could experience accelerated erosion as a result of project construction activities. Although these soils are in some cases easily detachable by rain and runoff, the relatively flat topography and gentle slopes in the net SAP area do not create a high potential for soil erosion.

The elevated risk of erosion associated with construction activity has long been acknowledged by regulators. Consequently, programs aimed at mitigating these effects are encoded in policies, laws, and regulations at various levels of government. Project proponents would comply with the state CBC and federal NPDES program and would implement BMPs for stream protection in accordance with proposed SAP Policy NR-3.5 and the Placer County Air Pollution Control District's minimum dust control requirements. Because construction during development phases implemented through the SAP would disturb more than 1 acre of soil, each construction phase would be subject to the Statewide Construction General NPDES Permit from CVRWQCB. Coverage under this permit requires preparation and implementation of a SWPPP, as discussed in Section 4.9, "Hydrology and Water Quality." SWPPPs would be required to identify temporary BMPs to prevent the transport of earthen materials from construction sites during periods of precipitation or runoff, and temporary BMPs would be required to prevent wind erosion of earthen materials.

However, given the size of the net SAP area and the extent of ground-disturbing activities that could occur as a result of implementing this portion of the project area, substantial soil erosion could occur. Therefore, impacts would be potentially significant.

PRSP Area

The topography and soils in the PRSP area and the implementation activities, required permits, and conditions would be similar to those associated with the net SAP area. In addition to the PRSP policies, compliance with proposed development standards would be required for the PRSP during construction and operation, including preparation and implementation of a SWPPP to treat and manage release of on-site stormwater runoff, using LID strategies to manage stormwater quality and reduce stormwater flows (postconstruction), and open space development standards that place restrictions on soil disturbance in open space areas. Also, the PRSP is designed to include substantial setbacks along on-site creeks and drainages that would remain primarily in a natural condition, including vegetation. These vegetated setbacks would provide additional erosion control in the vicinity of on-site creeks and drainages. However, given the size of the PRSP area and the extent of ground-disturbing activities that could occur as a result of implementing the PRSP, significant on- or off-site soil erosion could occur. Therefore, impacts would be potentially significant.

Other Supporting Infrastructure

Pleasant Grove Retention Facility

The Pleasant Grove Retention Facility is an off-site regional facility planned to provide retention capacity for development in the City of Roseville that has not yet been constructed. The topography and soils in the Pleasant Grove Retention Facility area and the implementation activities and required permits and conditions would be similar to those associated with the SAP area. The City of Roseville Development Services Department, which includes the Building, Engineering-Land Development, Code Enforcement, and Planning Divisions, maintains policies and guidelines relating to grading, erosion control, inspection, and permitting. These policies and guidelines, known as the City of Roseville Design and Construction Standards (adopted in March 2007, updated in January 2013, and amended in January 2014), require development of a grading plan to reduce potential impacts associated with the development of structures on expansive soils, changes in topography and soil erosion because of grading, slope instability, and increased erosion along stream channels. The City of Roseville requires the preparation of site-specific geotechnical studies as part of the building permit process. As required by Section 111-3 of the City's Design and Construction Standards, all grading improvements would be installed in accordance with provisions in the CBC and the recommendations of site-specific geotechnical reports and the geotechnical engineer. However, given the

size of the Pleasant Grove Retention Facility and the extent of ground-disturbing activities that could occur, significant on- or off-site soil erosion could occur. Therefore, impacts would be potentially significant.

Off-Site Transportation and Utility Improvements

The topography and soils in the other off-site transportation and utility improvement areas and the construction activities anticipated are similar to those associated with the SAP area. Off-site improvements would result in ground disturbance that could lead to increased erosion. Impacts would be potentially significant.

Conclusion

Implementation of the project involves construction activities that could expose soils previously protected by vegetation to the effects of wind and water erosion. Impacts would be **potentially significant**.

Mitigation Measures

Mitigation Measure 4.6-1a: Submit improvement plans (Net SAP Area and PRSP Area)

The project proponent shall prepare and submit improvement plans, specifications, and cost estimates (in accordance with the requirements of Section II of the Land Development Manual that are in effect at the time of submittal) to ESD for review and approval. The plans shall show all physical improvements as required by the conditions for the project, as well as pertinent topographical features both on and off site. All existing and proposed utilities and easements, on site and adjacent to the project, that may be affected by planned construction shall be shown on the plans. All landscaping and irrigation facilities within the public right-of-way (or public easements), or landscaping within sight distance areas at intersections, shall be included in the improvement plans. The project proponent shall pay plan check and inspection fees and Placer County Fire Department improvement plan review and inspection fees with the first improvement plan submittal. (NOTE: Before plan approval, all applicable recording and reproduction costs shall be paid.) The cost of the above-noted landscape and irrigation facilities shall be included in the estimates used to determine these fees. It is the project proponent's responsibility to obtain all required agency signatures on the plans and to secure department approvals. If the design/site review process and/or Development Review Committee (DRC) review is required as a condition of approval for the project, the review process shall be completed before improvement plans are submitted. Record drawings shall be prepared and signed by a California Registered Civil Engineer at the project proponent's expense and shall be submitted to the ESD in both hard copy and electronic versions in a format to be approved by the ESD before site improvements are accepted by the County.

Conceptual landscape plans submitted before project approval may require modification during the improvement plan process to resolve issues of drainage and traffic safety.

Mitigation Measure 4.6-1b: Implement improvement plans (Net SAP Area and PRSP Area)

The improvement plans shall show all proposed grading, drainage improvements, and vegetation and tree removal, and all work shall conform to provisions of the County Grading Ordinance (Ref. Article 15.48, Placer County Code) and Stormwater Quality Ordinance (Ref. Article 8.28, Placer County Code) that are in effect at the time of submittal. No grading, clearing, or tree disturbance shall occur until the improvement plans are approved and all temporary construction fencing has been installed and inspected by a member of the DRC. All cut/fill slopes shall be at a maximum of 2:1 (horizontal:vertical) unless a soils report supports a steeper slope and the ESD concurs with this recommendation.

The project proponent shall revegetate all disturbed areas. Revegetation, undertaken from April 1 through October 1, shall include regular watering to ensure adequate growth. A winterization plan shall be provided with project improvement plans. It is the project proponent's responsibility to ensure proper installation and maintenance of erosion control/winterization before, during, and after project construction. Stockpiled soil and borrow areas shall have proper erosion control measures applied for the duration of the construction as specified in the improvement plans. Erosion control shall be provided where roadside drainage is off the pavement, to the satisfaction of the ESD.

The project proponent shall submit to the ESD a letter of credit or cash deposit in the amount of 110 percent of an approved engineer's estimate for winterization and permanent erosion control work before improvement plan approval to guarantee protection against erosion and improper grading practices. One year after the County's acceptance of improvements as complete, if there are no erosion or runoff issues to be corrected, unused portions of the deposit shall be refunded to the project proponent or authorized agent.

If, at any time during construction, a field review by County personnel indicates a significant deviation from the proposed grading shown on the improvement plans, specifically with regard to slope heights, slope ratios, erosion control, winterization, tree disturbance, and/or pad elevations and configurations, the plans shall be reviewed by the DRC/ESD for a determination of substantial conformance to the project approvals before any further work is performed. Failure of the DRC/ESD to make a determination of substantial conformance may serve as grounds for the revocation/modification of the project approval by the appropriate hearing body.

Mitigation Measure 4.6-1c: Implement best management practices (Net SAP Area and PRSP Area)

The improvement plans shall show that water quality treatment facilities/BMPs shall be designed according to the guidance of the California Stormwater Quality Association stormwater BMP handbooks for construction, for new development/redevelopment, and for industrial and commercial (or other similar source as approved by the ESD). Construction (temporary) BMPs for the project include, but are not limited to:

- ▲ straw mulch,
- ▲ velocity dissipation devices,
- ▲ silt fencing,
- ▲ fiber rolls,
- ▲ storm drain inlet protection,
- ▲ wind erosion control, and
- ▲ stabilized construction entrances.

Storm drainage from on- and off-site impervious surfaces (including roads) shall be collected and routed through specially designed catch basins, vegetated swales, vaults, infiltration basins, water quality basins, filters, or similar features for entrapment of sediment, debris, and oils/greases or other identified pollutants as approved by the ESD. BMPs shall be designed in accordance with the *West Placer Storm Water Quality Design Manual for Sizing of Permanent Post-Construction Best Management Practices for Stormwater Quality Protection*. No water quality facility construction shall be permitted within any identified wetlands area, floodplain, or right-of-way, except as authorized by project approvals.

All permanent BMPs shall be maintained as required to ensure effectiveness. The project proponent shall provide for the establishment of vegetation, where specified, by means of proper irrigation. Proof of ongoing maintenance, such as contractual evidence, shall be provided to ESD upon request. Maintenance of these facilities shall be provided by the project owners/permittees and certification of completed maintenance reported annually to the County Department of Public Works and Facilities Stormwater Coordinator unless, and until, a County Service Area is created and said facilities are accepted by the County for maintenance. Contractual evidence of monthly parking lot sweeping and vacuuming and a catch basin cleaning program shall be provided to the ESD upon request. Failure to do so will be grounds for discretionary permit revocation. Before improvement plan or final subdivision map approval, easements shall be created and offered for dedication to the County for maintenance and access to these facilities in anticipation of possible County maintenance.

Mitigation Measure 4.6-1d: Submit improvement plans (Other Supporting Infrastructure)

The County shall work with the project proponent to coordinate with the City of Roseville to make sure improvement plans are submitted that meet all City requirements for accurate identification of features, such as topographical features; location of existing utilities and easements; proposed landscaping and irrigation facilities within public right of way; proposed grading and drainage improvements; and vegetation and tree removal (as well as any other items the City of Roseville requires for improvement plans).

Mitigation Measure 4.6-1e: Implement improvement plans (Other Supporting Infrastructure)

The County shall work with the project proponent to coordinate with the City of Roseville to make sure proposed grading, drainage improvements, and vegetation and tree removal are consistent with City requirements, including requirements for slopes and construction-related erosion control and stormwater quality protection as well as other specific City of Roseville requirements and conditions of approval.

Mitigation Measure 4.6-1f: Implement best management practices (Other Supporting Infrastructure)

The County shall work with the project proponent to coordinate with the City of Roseville to make sure that water quality treatment facilities/BMPs are designed according to the guidance of the California Stormwater Quality Association stormwater BMP handbooks for construction, for new development/redevelopment, and for industrial and commercial. Construction (temporary) BMPs include, but are not limited to:

- ▲ straw mulch,
- ▲ velocity dissipation devices,
- ▲ silt fencing,
- ▲ fiber rolls,
- ▲ storm drain inlet protection,
- ▲ wind erosion control, and
- ▲ stabilized construction entrances.

Significance after Mitigation

Implementation of Mitigation Measures 4.6-1a through 4.6-1c would reduce the significant impacts of erosion in the project area, excluding the Pleasant Grove Retention Facility site, which is outside Placer County's jurisdiction, through minimization of ground disturbance, installation of temporary and permanent erosion control BMPs, revegetation of disturbed areas, and compliance with Placer County construction standards for development within the net SAP area and PRSP area. Therefore, implementation of these mitigation measures would reduce the potential for construction in the net SAP or PRSP area to create substantial soil erosion and sedimentation to a less-than-significant level.

Implementation of Mitigation Measures 4.6-1d through 4.6-1f would reduce the significant impacts of erosion in the other supporting infrastructure areas (Pleasant Grove Retention Facility site and off-site transportation and utility improvement areas) through minimization of ground disturbance, installation of temporary and permanent erosion control BMPs, and revegetation of disturbed areas associated with compliance with City of Roseville requirements. However, the County does not have jurisdiction over the Pleasant Grove Retention Facility site or off-site transportation and utility improvement areas and cannot require the implementation of Mitigation Measures 4.6-1d through 4.6-1f. Therefore, this impact would be **significant and unavoidable**.

Impact 4.6-2: Damage or instability from construction on expansive soils

Implementation of the project involves construction of structures and roadways in areas that are expected to contain expansive soils. Unless recommendations of site-specific geotechnical studies (e.g., design of roads, foundations, retaining walls; grading practices) are implemented, development on these soils that would occur with implementation of the project could experience cracking, deterioration of roadway pavement, and damage to building foundations because of moisture-related changes in soil volume.

Regarding implementation of other supporting infrastructure, adherence to standard geotechnical engineering practices, building code requirements, and the City of Roseville Design and Construction Standards would minimize potential impacts from expansive soils such that no substantial risk to life or property would occur with implementation of the Pleasant Grove Retention Facility and other facilities proposed outside the SAP area.

Unless recommendations of site-specific geotechnical studies are implemented, this impact could be **potentially significant**.

Net SAP Area

Expansive soils are present in the net SAP area, as shown in Table 4.6-1. Structural limitations are imposed by the high shrink-swell potential and limited load-bearing strength of Alamo, Cometa, and Fiddymont soils. Development on these soils that would occur with implementation of the SAP could experience cracking, deterioration of roadway pavement, and damage to building foundations because of moisture-related changes in soil volume. Therefore, impacts would be potentially significant.

PRSP Area

The expansive soils in the PRSP area and the implementation activities anticipated in the area are similar to those associated with the SAP area. The *Preliminary Geotechnical Engineering Report: Placer Ranch* indicates that on-site soils are capable of exerting moderate expansion pressures on foundations and slab systems. The report generally recommends that future site-specific geotechnical engineering investigations be performed and that all recommendations be implemented as structure types and locations are determined (Wallace-Kuhl & Associates 2004). If these recommendations were not included in site-specific soils engineering reports, the impact would be potentially significant.

Other Supporting Infrastructure

Pleasant Grove Retention Facility

The Pleasant Grove Retention Facility is a regional facility planned to provide retention capacity for development within the City of Roseville. The retention facility site consists of expansive soils similar to those in the SAP area. Implementation of the retention facility could involve the construction of earthen embankments and concrete inlet and outlet structures. The integrity of the inlet and outlet structures could be adversely affected by the presence of expansive soils. The City of Roseville Development Services Department maintains policies and guidelines relating to grading, erosion control, inspection, and permitting. These policies and guidelines, known as the City of Roseville Design and Construction Standards (adopted in March 2007, updated in January 2013, and amended in January 2014), require development of a grading plan to reduce potential impacts associated with the development of structures on expansive soils, changes in topography and soil erosion because of grading, slope instability, and increased erosion along stream channels. The City of Roseville requires the preparation of site-specific geotechnical studies as part of the building permit process. As required by Section 111-3 of the City's Design and Construction Standards, all grading improvements would be installed in accordance with provisions in the CBC and the recommendations of site-specific geotechnical reports and the geotechnical engineer. As a requirement of the CBC and City of Roseville Design and Construction Standards, the project proponent would be required to prepare a soils engineering analysis and preliminary soils report for areas prone to geologic hazards and where critically expansive soils are expected to exist, and implement engineering recommendations. Structures would be designed and built in conformance with the CBC, which could require measures such as soil replacement, lime treatment, and posttensioned foundations. Implementation of these design features in compliance with the CBC would minimize adverse effects associated with expansive soils. Thus, no substantial risk to life or property would occur and the impact would be less than significant.

Off-Site Transportation and Utility Improvements

The other facilities proposed outside the SAP area (i.e., extension and expansion of roadways and utility lines in the City of Roseville) are located in areas that consist of expansive soils similar to those in the SAP area. As a requirement of the CBC, the project proponent would be required to prepare a soils engineering analysis and preliminary soils report for areas prone to geologic hazards and where critically expansive soils are expected to exist, and implement engineering recommendations. Roads and utilities would be designed and built in conformance with the CBC, which would require measures such as soil replacement, lime treatment, and posttensioned foundations. Thus, for the same reasons described above, no substantial risk to life or property would occur, and the impact would be less than significant.

Conclusion

Implementation of the project would involve construction of structures, roadways, and other facilities in areas that contain expansive soils. Implementation of other supporting infrastructure (Pleasant Grove Retention Facility and other off-site transportation and utility improvements) would be required to meet CBC

and City of Roseville requirements, which would require engineering specifications to address expansive soils. Regarding the net SAP and PRSP areas, compliance with the CBC and SAP Policies HS-5.1 and HS-5.2 would require that a soils engineering analysis be conducted and preliminary soils report be prepared, ensuring that proper construction and design measures would be implemented such that no substantial risk to life or property from development on expansive soils would occur. However, although the general soils conditions are understood in the net SAP area, site-specific geotechnical evaluation has not been conducted in this area. Regarding the PRSP area, the geotechnical report prepared for the PRSP identified specific measures that would reduce potential expansive soils-related impacts for development in the PRSP area. Therefore, unless these recommendations are implemented, the impact could be **potentially significant**.

Mitigation Measures

Mitigation Measure 4.6-2a: Submit preliminary and final geotechnical engineering reports (Net SAP Area)

Proponents of projects within the net SAP area shall submit to ESD for review and approval a preliminary geotechnical report, prepared by a Registered Civil Engineer or Geotechnical Engineer, as part of the subsequent entitlement application review.

Improvement plan submittals for development within the net SAP area shall include a final geotechnical engineering report produced by a California Registered Civil Engineer or Geotechnical Engineer for ESD review and approval. The report shall address and make recommendations on:

- ▲ road, pavement, and parking area design;
- ▲ structural foundations, including retaining wall design (if applicable);
- ▲ grading practices;
- ▲ erosion/winterization;
- ▲ special problems discovered on-site (e.g., groundwater, expansive/unstable soils); and
- ▲ slope stability.

Once approved by the ESD, two copies of the final report shall be provided to the ESD and one copy to the Building Services Division for its use. It is the responsibility of the developer to provide for engineering inspection and certification that earthwork has been performed in conformity with recommendations contained in the report.

Mitigation Measure 4.6-2b: Submit final geotechnical engineering report (PRSP Area)

The Improvement plan submittals for development within the PRSP area shall include a final geotechnical engineering report produced by a California Registered Civil Engineer or Geotechnical Engineer for ESD review and approval. The report shall address and make recommendations on:

- ▲ road, pavement, and parking area design;
- ▲ structural foundations, including retaining wall design (if applicable);
- ▲ grading practices;
- ▲ erosion/winterization;
- ▲ special problems discovered on-site (e.g., groundwater, expansive/unstable soils); and
- ▲ slope stability.

Once approved by the ESD, two copies of the final report shall be provided to the ESD and one copy to the Building Services Division for its use. It is the responsibility of the developer to provide for engineering inspection and certification that earthwork has been performed in conformity with recommendations contained in the report.

If the soils report indicates the presence of critically expansive or other soils problems that, if not corrected, could lead to structural defects, a certification of completion of the requirements of the soils report shall be required for

subdivisions, before issuance of building permits. This certification may be completed on a lot-by-lot basis or on a tract basis. This shall be so noted on the improvement plans; in the development notebook; in the conditions, covenants, and restrictions; and on the informational sheet filed with the final subdivision map(s).

Mitigation Measure 4.6-2c: Implement geotechnical recommendations (PRSP Area)

Before approval of grading plans within the PRSP area, the project proponent shall submit, for review and approval by the County, site-specific soils engineering reports that include recommendations, based on the specific soil conditions, for design of foundations, roadway subgrades, grading and construction techniques, fill material and compaction, and other necessary recommendations in compliance with the CBC.

Recommendations from the *Preliminary Geotechnical Engineering Report: Placer Ranch* (Wallace-Kuhl & Associates 2004) shall be incorporated into the site-specific soils engineering reports (and shall be updated as needed in accordance with CBC requirements). The following recommendation addresses expansive soils:

- ▲ Maintaining higher moisture content in subgrade soils at the time of construction, chemical treatment of near-surface soils (e.g., lime treatment), and/or deepened or post-tensioned foundation systems.

Significance after Mitigation

Regarding other supporting infrastructure (Pleasant Grove Retention Facility and other off-site transportation and utility improvements), adherence to standard geotechnical engineering practices, building code requirements, and the City of Roseville Design and Construction Standards would minimize potential impacts from expansive soils such that no substantial risk to life or property would occur with implementation of the Pleasant Grove Retention Facility and other facilities proposed outside the SAP area.

Implementation of Mitigation Measures 4.6-2a through 4.6-2c would reduce the potential for development within the net SAP area and the PRSP area to expose people and property to unstable soil conditions by requiring project proponents to prepare a geotechnical engineering report and soils report for areas prone to geologic hazards and areas where critically expansive soils are expected to exist, and implement all feasible recommendations to prevent such hazards. These mitigation measures require compliance with the CBC requirements, the Placer County Code, and SAP Policies HS-5.1 and HS-5.2. Therefore, project impacts would be reduced to a **less-than-significant** level.

Impact 4.6-3: Loss of availability of mineral resources

The project area is classified MRZ-4. No mineral resources of value are known to exist in this area. The project area does not contain sites designated as locally important mineral resource recovery sites on a local general plan, specific plan, or other land use plan. Furthermore, given the surrounding developed land uses, commercial mining operations are unlikely to be feasible because compatibility impacts on adjacent land uses may not be adequately mitigated. Therefore, this impact would be **less than significant**.

Net SAP Area

The net SAP area is classified MRZ-4. No mineral resources of value are known to exist in the area, nor does it contain sites designated as locally important mineral resource recovery sites in a local general plan, specific plan, or other land use plan. It is possible, based on the proximity of historical mining sites and geologic data, that yet-undiscovered mineral resources exist in the area. However, the existing 1997 *Sunset Industrial Area Plan* does not permit mining uses in the project area. Thus, implementing the proposed SAP would not change the availability of mineral resources. Therefore, loss of availability of mineral resources related to SAP implementation would be a less-than-significant impact.

PRSP Area

The PRSP area is classified MRZ-4, and no lands within the area are zoned Mineral Reserve Combining District (-MR), where mining uses are permitted. For the same reasons described above, this impact would be less than significant.

Other Supporting Infrastructure

Pleasant Grove Retention Facility

The Pleasant Grove Retention Facility site is classified MRZ-4, and no lands within the area are zoned Mineral Reserve Combining District (-MR), where mining uses are permitted. For the same reasons described above, this impact would be less than significant.

Off-Site Transportation and Utility Improvements

The off-site transportation and utility improvement areas are classified MRZ-4, and no lands within the areas are zoned Mineral Reserve Combining District (-MR), where mining uses are permitted. For the same reasons described above, this impact would be less than significant.

Conclusion

No mineral resources of value are known to exist in the project area. The project area does not contain sites designated as locally important mineral resource recovery sites on a local general plan, specific plan, or other land use plan. Furthermore, no lands within the project area are zoned Mineral Reserve Combining District (-MR), where mining uses are permitted. Therefore, this impact would be **less than significant**.

Mitigation Measures

No mitigation is required.

Impact 4.6-4: Loss of a unique paleontological resource or geologic feature

No paleontological resources or geologic features are known to exist within the project area. However, the geologic units underlying the area have a high paleontological sensitivity. Implementation of the project would involve ground-disturbing activities that could affect undiscovered paleontological resources. This impact would be **potentially significant**.

Net SAP Area

No paleontological resources or geologic features are known to exist within the net SAP area; however, geologic units underlying the area have a high paleontological sensitivity. Ground-disturbing activities of 10 feet or more have potential to affect undiscovered paleontological resources. Implementation of the SAP involves construction and ground disturbance that could potentially destroy unknown paleontological resources. SAP Policies CR-1.6 and CR-1.7 require that development projects be designed to avoid potential impacts on significant cultural resources whenever possible and require the suspension of construction activities within 100 feet of a discovery if unknown cultural resources are encountered. However, impacts on paleontological resources could still occur if construction personnel are not adequately trained about the possibility of encountering fossils, the appearance and types of fossils likely to be seen during construction, and the proper stop-work and notification procedures to follow if fossils are encountered. Thus, this impact would be potentially significant.

PRSP Area

No paleontological resources or geologic features are known to exist within the PRSP area; however, geologic units underlying the area have a high paleontological sensitivity. Thus, for the same reasons described above, this impact would be potentially significant.

Other Supporting Infrastructure

Pleasant Grove Retention Facility

No paleontological resources or geologic features are known to exist within the Pleasant Grove Retention Facility area; however, geologic units underlying the area have a high paleontological sensitivity. Thus, for the same reasons described above, this impact would be potentially significant.

Off-Site Transportation and Utility Improvements

No paleontological resources or geologic features are known to exist within the off-site transportation and utility improvement areas; however, geologic units underlying the areas have a high paleontological sensitivity. Thus, for the same reasons described above, this impact would be potentially significant.

Conclusion

Although no paleontological resources or geologic features are known to exist within the project area, the geologic units underlying the areas have a high paleontological sensitivity. Thus, implementation of the project, which would involve ground-disturbing activities, has potential to affect undiscovered paleontological resources. This impact would be **potentially significant**.

Mitigation Measure 4.6-4a: Train construction personnel on protocol to follow if fossils are encountered (Net SAP Area and PRSP Area)

Prior to construction commencing and before initiating earthmoving activities in areas likely to contain important paleontological or geologic features (including Upper Riverbank Formation, Turlock Lake, or undifferentiated Quaternary Alluvium sediments), project proponents shall retain a qualified paleontologist to train all construction personnel involved with earthwork in those areas. The paleontologist will teach construction workers about the possibility of encountering fossils, the appearance and types of fossils likely to be seen during construction, and the proper stop-work and County-approved notification procedures to follow if fossils are encountered. A note to contractors regarding this requirement shall be included on the Improvement Plans.

Mitigation Measure 4.6-4b: Train construction personnel on protocol to follow if fossils are encountered (Other Supporting Infrastructure)

The County shall coordinate with the City of Roseville to make sure project proponents retain a qualified paleontologist to train all construction personnel involved with earthwork in geologic units with high paleontological sensitivity. The paleontologist should teach construction workers about the possibility of encountering fossils, the appearance and types of fossils likely to be seen during construction, and the proper stop-work and notification procedures to follow if fossils are encountered.

Significance after Mitigation

Implementation of Mitigation Measure 4.6-4a would reduce potentially significant impacts on undiscovered paleontological resources by providing proper paleontological resource training to construction workers. Proper training would ensure that if paleontological resources are encountered, they would be properly identified and avoided or handled appropriately. Therefore, implementation of this mitigation measure would reduce impacts to unique paleontological resources or geologic features to a less-than-significant level.

Implementation of Mitigation Measure 4.6-4b would reduce potentially significant impacts on undiscovered paleontological resources by providing proper paleontological resource training to construction workers. However, the County does not have jurisdiction over the Pleasant Grove Retention Facility site or off-site transportation and utility improvement areas and cannot require the implementation of Mitigation Measure 4.6-4b. Therefore, this impact would be **significant and unavoidable**.

Impact 4.6-5: Consistency with applicable General Plan policies

The project is consistent with the policies of the *Placer County General Plan* relating to geology and soils. This impact would be **less than significant**.

The relevant goals and policies of the Placer County General Plan (Placer County 2013) regarding seismic and geological issues are included in Section 4.6.3, "Regulatory Setting," earlier in this section.

Development projects in the SAP area would be designed to avoid potential impacts on significant cultural resources whenever possible, consistent with Goal 5.D and Policy 5.D.6, and would require proper training of

construction personnel regarding the possibility of encountering fossils, the appearance and types of fossils likely to be seen during construction, and the proper stop-work and notification procedures to follow if fossils are encountered.

Topography in the project area is relatively flat, and development on hillsides would be limited and would conform to the provisions of the County Grading Ordinance and Stormwater Quality Ordinance, consistent with Goal 6.D and Policy 6.D.9. Erosion control BMPs such as use of silt fencing, fiber rolls, and specially designed swales and catch basins, would be implemented during ground-disturbing activities. This would protect the natural resources of the County, consistent with Goal 6.E and Policy 6.E.2.

A geotechnical engineering report would be required in accordance with the requirements of Section II of the Placer County Land Development Manual, and buildings constructed in the project area would be built to CBC standards. This would minimize the loss of life, injury, and property damage attributable to seismic and geological hazards, consistent with Goal 8.A and Policies 8.A.1, 8.A.2, and 8.A.3.

Because the project is consistent with the applicable General Plan policies as discussed, impacts related to General Plan consistency would be **less than significant**.

CUMULATIVE IMPACTS

Geology, soils, and paleontological resource impacts are project specific and highly dependent on localized geologic and soil conditions. Therefore, the geographic extent for considering cumulative impacts for these resources is project sites within the vicinity of the project area in western Placer County. See Table 4.0-2, which includes a list of past, present, and probable future projects that, if fully built out, would develop over 50,000 acres in the area. The geographic scope for cumulative impacts on mineral resources includes Placer County and the broader region because loss of availability of mineral resources anywhere in the county would combine with potential mineral resource impacts of the project to result in a cumulative impact on countywide mineral resources.

Cumulative Impact 4.6-6: Cumulative soil erosion

The project area and vicinity are characterized by limited topographic relief and variation. Soils susceptible to erosion are present in the region and could experience accelerated erosion because of project activities. Although these soils are in some cases easily detachable by rain and runoff, topography and slope characteristics in the region do not create a high proclivity for soil erosion. Construction of individual projects implemented under the SAP would involve clearing and grading in areas where new structures would be built, as well as trenching for placement of utility connections. These activities would temporarily expose soils otherwise protected by vegetation to the effects of wind and water erosion.

The project, like all projects that would disturb more than 1 acre, would be required to adhere to the erosion control requirements of the NPDES Construction General Permit. The permit requires construction projects to implement BMPs to control earthwork activities and prevent erosion. For this reason, the County and adjacent cities have generally found geologic hazards not to be substantial issues in the project vicinity. The project, as well as other current and future projects, would implement BMPs and would adhere to the NPDES Phase II MS4 Permit drainage control requirements during the operational phases. Through these actions, the overall contribution to erosion and loss of topsoil would not be substantial, and there would be no significant cumulative impact. The project would not make a considerable contribution to a significant cumulative impact. The impact would be **less than significant**.

Cumulative Impact 4.6-7: Cumulative impacts related to expansive soils

NRCS soil data indicate that expansive soils are present in the project region. Expansive soils represent site-specific hazards; therefore, impacts related to these soils do not combine such that a cumulative impact could result. The project and other projects in the vicinity would adhere to project-specific geotechnical report recommendations to ensure that any potentially expansive soils are conditioned or replaced in accordance with geotechnical standards and building code requirements. Adhering to standard engineering

practices, in accordance with the CBC and County standards, would address potential impacts related to expansive soils such that no substantial cumulative risk to life or property would occur. Therefore, the project would not make a considerable contribution to a significant cumulative impact. This impact would be **less than significant**.

Cumulative Impact 4.6-8: Cumulative loss of availability of mineral resources

The Placer County General Plan Final EIR concludes that with implementation of the policies and programs identified in the General Plan, buildout under the General Plan Land Use Diagram would not preclude the extraction of significant mineral resources. For instance, compliance with *Placer County General Plan Policy 1.J.4.* would discourage the development of incompatible land uses in areas that have been identified as having potentially significant mineral resources. The impact associated with buildout of the *Placer County General Plan*, as it relates to potential loss of significant mineral resources, would be less than significant. As stated above, no mineral resources of value are known to exist in the project area, nor does the area contain sites designated as locally important mineral resource recovery sites. Furthermore, the existing *Sunset Industrial Area Plan* does not permit mining uses in the project area. Thus, project implementation would not change the availability of mineral resources. Cumulative impacts relative to availability of mineral resources would be less than significant. Therefore, the project would not make a considerable contribution to a significant cumulative impact. This impact would be **less than significant**.

Cumulative Impact 4.6-9: Cumulative loss of a unique paleontological resource or geologic feature

No unique geologic features are known to exist in the project area. Paleontological resources have been discovered in the region considered for cumulative impacts, and some regional geologic units are considered to have a high paleontological sensitivity. Unique paleontological resources are a nonrenewable resource. It is possible that these resources could be encountered during implementation of the project, as well as during implementation of other projects in the vicinity. Destruction or loss of these resources during construction would contribute to a regional cumulative loss because paleontological resources are finite and contribute to our scientific repository of knowledge regarding the region. However, there is no evidence to suggest that implementing the proposed project, in combination with past, present, and reasonably foreseeable future projects, would result in a significant cumulative impact on paleontological resources.

SAP Policies CR-1.6 and CR-1.7 require that development projects be designed to avoid potential impacts on significant cultural resources whenever possible and require the suspension of construction activities within 100 feet of a discovery if unknown cultural resources are encountered. Mitigation Measure 4.6-4 requires proper training of construction workers involved in earthmoving activities about the possibility of encountering fossils. Projects in the vicinity of the project area, such as the *Lincoln Village 5 Specific Plan*, *Creekview Specific Plan*, and *Amoruso Ranch Specific Plan*, include similar policies and mitigation measures to protect paleontological resources (City of Lincoln 2016; City of Roseville 2011, 2016). With the implementation of Mitigation Measure 4.6-4, the project would not make a considerable contribution to a significant cumulative impact. This impact would be **less than significant**.

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