

# CHAPTER 12.0

## SOILS, GEOLOGY, AND SEISMICITY

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This section addresses the potential for the proposed project to result in adverse impacts related to soils, geology, and seismicity. Following an overview of the geologic setting and the relevant regulatory setting, project-related impacts and recommended mitigation measures are presented.

### 12.1 ENVIRONMENTAL SETTING

#### 12.1.1 TOPOGRAPHY

The project site consists of a previously graded and developed parcel containing Thunder Valley Casino and associated facilities. The offsite improvement area consists of a paved overflow parking lot south of the project site as well as unpaved areas adjacent to Athens Avenue and Thunder Valley Court. The topography of the project site and offsite improvement area is relatively flat, with slight elevation changes to accommodate surface water runoff. Surrounding areas are generally flat and open, with gently sloping hills comprising the industrial and agricultural land and vacant natural grassland of the Sunset Industrial Area (SIA). Elevations in the area generally range from approximately 120 to 140 feet above mean sea level (msl). Several creeks and natural drainages in the vicinity of the project site and offsite improvement area include Orchard Creek to the north and several unnamed tributaries to Pleasant Grove Creek to the south. Slopes in the vicinity of the project site are slightly varied, from approximately 2 to 9 percent.

#### 12.1.2 GEOLOGY

The project site and offsite improvement area are located within the transition zone between the Sacramento Valley and the foothills of the Sierra Nevada Mountains. Geologic formations mapped in the transition zone and in the vicinity of the project site include recent alluvium (Holocene), older alluvium (Pleistocene) and volcanic deposits (Pliocene and Miocene). The project site is underlain by Quaternary-age alluvial sediments of the Turlock Lake Formation (Fugro West, Inc., 2006). The Turlock Lake formation consists of semi-consolidated and inter-bedded clay, silt, sand, and deeply weathered gravel. Local streams and rivers deposited layers of these constituents as their courses changed over time.

A site-specific geotechnical study was conducted in 2006 to evaluate geology and soils on the project site (**Appendix I**). The geotechnical study included taking several soil borings to analyze for various soil parameters. Subsurface soil borings were drilled through the existing asphalt pavement located on the

west side of Thunder Valley Casino. Information on soils and seismicity is presented below, while information on groundwater within the project site is presented in **Chapter 13.0**.

### **12.1.3 MINERAL RESOURCES**

Placer County contains several mineral extraction sites, including mines and other operations that extract clay, gold, sand, gravel, stone, and limestone. Several clay extraction facilities are located approximately four miles to the north of the project site outside the City of Lincoln. Patterson Sand and Gravel Mine, owned by Cemex Construction Materials LP, is located approximately 13 miles north of the project site on the western side of Camp Far West Road. No mineral resources are known to exist within the project site or offsite improvement area.

### **12.1.4 SOILS**

#### ***SOIL SURVEYS***

A soil survey report for the project site and offsite improvement area is available online through the Natural Resource Conservation Service (NRCS), a sub-unit of the United States Department of Agriculture (USDA). Soil types in the vicinity of the project site were determined using the online NRCS soil survey (2007) as well as the Placer County soil survey (SCS, 1980). Each survey maps soil units and provides a summary of major physical characteristics with recommendations based on the soil characteristics. Soil maps in the vicinity of the project site and offsite improvement area include: Alamo-Fiddymment complex (0 to 5 percent slopes), Fiddymment-Kaseberg loam (1 to 5 percent slopes), Cometa-Fiddymment complex (1 to 5 percent slopes) Ramona Sandy loam (2 to 9 percent slopes), Exchequer-Rock outcrop complex soils (2 to 30 percent slopes), and Xerofluvents, frequently flooded. The soil map is provided in **Figure 12-1** and soil descriptions are discussed below.

Near surface soils that dominate the project site and the offsite improvement area belong to the Fiddymment-Kaseberg soil series (map symbol 147) (NRCS, 2007; Fugro West, Inc., 2006). The Fiddymment loam is described as moderately deep over a silica-indurated hardpan formed over bedded siltstone. Kaseberg loam is described as well-drained, shallow soil over hardpan. Both Fiddymment and Kaseberg soil series are classified as hydrologic group D, which accounts for soils that have a very slow water infiltration rate when thoroughly wet and slow rate of water transmission. Hydrologic group D soils consist chiefly of clays that have a high shrink-swell potential (classified as expansive), soils that have a high water table, soils that have a clay pan or clay layer at or near the surface, and soils that are shallow and located over nearly impervious material. Because of the clay content these soils have a high rate of surface water runoff and are classified as well drained. These soils do not experience severe ponding or flooding and have a very low susceptibility to sheet and rill erosion (NRCS, 2007). Physical properties of Fiddymment-Kaseberg soil series are listed in **Table 12-1**.

The Cometa-Fiddymment complex soil series (map symbol 141) occurs northwest of the project site and within the western section of the offsite improvement area along Athens Avenue. These soils are

**Figure 12-1: Soils Map**

generally found on low terraces west of State Route 65 and south of Auburn Ravine at elevations of 75 to 200 feet. The approximate map unit composition is 35 percent Cometa soil, 35 percent Fiddymment soil, 10 percent San Joaquin sandy loam, 10 percent Kaseberg loam, 5 percent Ramona sandy loam on scattered narrow ridges, and 5 percent Alamo clay in drainageways and basins (SCS, 1980, NRCS, 2007). Cometa-Fiddymment complex (1 to 5 percent slopes) contains partially hydric soil in depressions. The soil is a poorly- to very poorly drained soil with a water table at less than one foot from the surface during the growing season if permeability is less than 6 inches per hour in any layer within 20 inches (NRCS, 2007).

The Alamo-Fiddymment complex soil series (map symbol 104) occurs along the west side of the offsite improvement area along Athens Avenue and north of Orchard Creek. These nearly level to undulating soils are on low terraces at elevations of 50 to 130 feet. The approximate map unit composition is 50 percent Alamo soil, 30 percent Fiddymment soil, 10 percent San Joaquin sandy loam, 5 percent Cometa sandy loam, and 5 percent Kaseberg loam (SCS, 1980, NRCS, 2007). Alamo-Fiddymment complex (0 to 5 percent slopes) contains partially hydric soil in depressions. The soil is a poorly to very poorly drained soil with a water table at less than or equal to one foot from the surface during the growing season if permeability is less than 6 inches per hour in any layer within 20 inches (NRCS, 2007).

The Ramona Sandy loam soil series (map symbol 175) occurs between the northwest corner of the project site and Orchard Creek. The soil is undulating, very deep, and well drained on low terraces at elevations of 100 to 200 feet. The soil formed in alluvium from predominantly granitic sources. The area this soil type occurs in also contains included areas of Cometa sandy loam consisting of approximately 10 percent of the acreage, Kilaga loam consisting of approximately 10 percent of the acreage, and San Joaquin sandy loam consisting of approximately 5 percent of the acreage. Ramona Sandy loam (2 to 9 percent slopes) is classified as a partially hydric soil with drainageways that are frequently flooded for a long or very long duration during the growing season (NRCS, 2007).

The Exchequer-Rock outcrop complex (map symbol 145) occurs on the east side of the project site and offsite improvement area. This soil type occurs on the tops and side slopes of long, broad volcanic ridges at elevations of 100 to 1000 feet. The approximate map unit composition is 60 percent Exchequer soil, 15 percent andesitic breccia (lava cap), 10 percent included areas of Inks cobbly loam, 5 percent reddish brown loam subsoil similar to Inks, and 5 percent shallow soil that has a brown clay subsoil. Exchequer-Rock outcrop complex (2 to 30 percent slopes) is classified as a partially hydric soil with depressions and drainageways that are frequently ponded for a long or very long duration during the growing season (NRCS, 2007).

Xerofluvents (map symbol 194) occur along the north and south side of Orchard Creek. This soil type consists of narrow stringers of somewhat poorly drained recent alluvium adjacent to stream channels. Xerofluvents are classified as a hydric soil with drainageways that are frequently flooded for a long or very long duration during the growing season. This soil is variable colored, stratified gravelly sandy

loams, gravelly loams, and gravelly clay loams that generally grade to sand and gravel with increasing depth. The depth to underlying restrictive material is greater than 36 inches (NRCS, 2007).

**TABLE 12-1**  
**SOIL PROPERTIES OF FIDDYMENT-KASEBERG LOAM**

Map Symbol	Slope	Erosion Kf <sup>a</sup>	Depth to Bedrock (inches)	Hydrologic Group	Representative Value		
					% Sand	% Silt	% Clay
Fiddyment	2-9 %	0.43	35-39	D	44.8	41.2	14
Kaseberg	2-9%	0.43	17-21	D	44.3	40.7	15

Notes: <sup>a</sup> The K factor of a soil indicates its inherent susceptibility to erosion. The following soil characteristics used in determining the K factor include: organic matter content, soil texture (% of very fine sand and silt), structure, soil depth, permeability, and the presence of impervious subsurface layers. K factors of less than 0.3 are less easily eroded, while more easily eroded soils with low infiltration capacities will have a K factor of 0.3 or higher.

Source: USDA NRCS, 9/21/2007; AES, 2007

### ***EXPANSIVE SOIL POTENTIAL***

The potential for soils to demonstrate expansive properties is primarily dependent upon clay content. Clay particles can swell by absorbing large amounts of water relative to their volume. When these particles dry out, they shrink. Conversely, when rain falls on dried clays, the clays swell and the ground can rise several inches. Onsite soils have expansion indices and plasticity index (PI) that do not indicate a high shrink-swell potential. The expansion potential for soils within the project area and offsite improvement area is therefore considered low (Fugro West, Inc., 2006).

### ***SOIL EROSION POTENTIAL***

Soil erosion is the removal of the soil particles from the ground surface and the transportation of soil resulting in deposition in a remote location. Mechanisms of soil erosion include natural phenomena such as stormwater runoff and wind, as well as human activities, such as changes in drainage patterns and removal of vegetation. Factors that influence soil erosion include physical properties of the soil, topography (slope), annual rainfall, and peak rainfall intensity. The erosion potential of the soils on or near the surface is considered to be low to moderate, due to the high clay content and generally flat topography. Additionally, the 90% relative compaction of the engineered fill material contributes to the low erosion potential. Potential project-related impacts resulting from erosion are discussed more thoroughly in **Chapter 13.0**.

## **12.1.5 SEISMICITY**

### ***ACTIVE FAULTS***

The Foothills fault system is a major zone of faulting that occurs in basement rock present in the western Sierra Nevada Mountains. The fault system extends from the Melones Fault zone on the east to the westernmost exposure of metamorphic rocks, west of the Bear Mountain fault zone. These faults are not

considered to be active and the relative risk of earthquakes in this region of Northern California is considered lower compared to other areas of the State. The site is within Seismic Zone 3 (a moderate seismic risk zone) of the Uniform Building Code.

The Spenceville and portions of the Bear Mountain fault zones are located in a broad zone north and east of the project site (**Figure 12-2**). No evidence of Holocene activity (within the last 11,000 years) has been documented on any of the faults in the vicinity of the project site. However, most of the foothill faults are considered by the California Division of Mines and Geology to be potentially active. An earthquake may result in several seismic hazards, including ground surface rupture, liquefaction, and ground shaking. The intensity of ground shaking is dependent upon several factors including distance from the epicenter, earthquake intensity, soil and rock types, geologic formation and condition, and soil moisture conditions. Secondary geologic hazards related to seismic events include lurching, ground cracking, settlement, and slope failures (e.g. landslides).

### ***Surface Rupture Potential***

Surface ruptures occur when movement along both sides of faults, which are located deep underground, produces enough energy to cause a fracture on the surface. The Alquist-Priolo Act limits development on lands within a potential fault rupture zone. Surface rupture is considered unlikely in the project site and offsite improvement area due to the prevalence of very stiff to hard fine soils, as well as the distance between the project area and any major faults.

### ***Liquefaction Potential***

Liquefaction occurs when vibrations produced by an earthquake cause the soil particles to temporarily behave as a liquid, leading to instability of buildings located on such soils through lateral spreading or differential settlement (California Division of Mines and Geology, 1997). Soils most susceptible to liquefaction are loose, clean, poorly graded, fine-grained soils. Liquefaction is most prevalent in poorly consolidated, water-saturated fine sand and silt within 50 feet of the ground surface. Soils on the project site and offsite improvement area consist of very stiff to hard fine soils and dense granular soils that have sufficient density to preclude the possibility of liquefaction.

### ***Ground Shaking***

The Modified Mercalli Intensity (MMI) scale (**Table 12-2**) is a common measure of earthquake effects due to ground shaking intensity. The MMI values for intensity range from I (earthquake not felt) to XII (damage nearly total), and intensities ranging from IV to XI could cause moderate to significant structural damage. Anticipated earthquake intensity within a particular area is commonly estimated as peak ground acceleration (PGA). The PGA for the project area was calculated for a 475-year event utilizing the California Geological Survey's Probabilistic Seismic Hazards Assessment Models (Fugro West, Inc., 2006). The estimated PGA for the project site is 0.12 g, where 'g' represents the force of gravity, which translates into an intensity value of VII. During an earthquake, according to the MMI, shaking severity would be moderate. A moderate shaking intensity creates little to no structural damage in well-designed

**Figure 12-2:** Regional Fault Map

and well-constructed buildings; concrete-lined drainage ditches might be damaged, as well as some types of masonry work (e.g., chimneys). Drivers in cars would notice the shaking at this intensity, and the typical reaction of people inside buildings would be to run outside or seek a safe area.

**TABLE 12-2  
MODIFIED MERCALLI INTENSITY SCALE**

<b>Intensity Value</b>	<b>Intensity Description</b>	<b>Average Peak Ground Acceleration<sup>a</sup></b>
I.	Not felt except by a very few persons under especially favorable circumstances.	< 0.0015g
II.	Felt only by a few persons at rest, especially on upper floors on buildings. Delicately suspended objects may swing.	< 0.0015g
III.	Felt quite noticeably indoors, especially on upper floors of buildings, but many persons do not recognize it as an earthquake. Standing cars may rock slightly. Vibration similar to the passing of a truck. Duration estimated.	< 0.0015g
IV.	During the day felt indoors by many, outdoors by few. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motorcars rocked noticeably.	0.015g-0.02g
V.	Felt by nearly everyone, many awakened. Some dishes, windows, etc., broken; a few instances of cracked plaster; unstable objects overturned. Disturbances of trees, poles, and other tall objects sometimes noticed. Pendulum clocks may stop.	0.03g-0.04g
VI.	Felt by all, many frightened and run outdoors. Some heavy furniture moved; a few instances of fallen plaster or damaged chimneys. Damage slight.	0.06g-0.07g
VII.	Everybody runs outdoors. Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable in poorly built or badly designed structures; some chimneys broken. Noticed by persons driving cars.	0.10g-0.15g
VIII.	Damage slight in specially designed structures; considerable in ordinary substantial buildings, with partial collapse; great in poorly built structures. Panel walls thrown out of frame structures. Fall of chimneys, factory stacks, columns, monuments, and walls. Heavy furniture overturned. Sand and mud ejected in small amounts. Changes in well water. Persons driving cars disturbed.	0.25g-0.30g
IX.	Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb; great in substantial buildings, with partial collapse. Buildings shifted off foundations. Ground cracked conspicuously. Underground pipes broken.	0.50g-0.55g
X.	Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations; ground badly cracked. Rails bent. Landslides considerable from riverbanks and steep slopes. Shifted sand and mud. Water splashed (slopped) over banks.	> 0.60g
XI.	Few, if any, masonry structures remain standing. Bridges destroyed. Broad fissures in ground. Underground pipelines completely out of service. Earth slumps and land slips in soft ground. Rails bent greatly.	> 0.60g
XII.	Damage total. Practically all works of construction are damaged greatly or destroyed. Waves seen on ground surface. Lines of sight and level are distorted. Objects are thrown upward into the air.	> 0.60g

Note: <sup>a</sup> g is gravity = 9.8 meters per second squared.

Source: Bolt, 1993

## 12.2 REGULATORY SETTING

The following text provides an overview of State and County laws, codes, goals, and policies relevant to soils and geology in the context of the proposed project.

### 12.2.1 STATE

#### *ALQUIST-PRIOLO EARTHQUAKE FAULT ZONING ACT*

The Alquist-Priolo Earthquake Fault Zoning Act (formerly the Alquist-Priolo Special Studies Zone Act) requires delineation of zones along active faults in California, in order to regulate development on or near active fault traces, and to prohibit the placement of structures intended for human occupancy from being built across these traces. As a result of implementation of the Act, cities and counties are required to regulate development projects within fault zones. While Alquist-Priolo Zones are intended to identify active fault traces, rupture of surface faults and other seismic activities are not necessarily restricted to the Alquist-Priolo Zones.

#### *SEISMIC HAZARDS MAPPING ACT*

The Seismic Hazards Mapping Act was developed to protect the public from hazards caused by earthquakes, including strong ground shaking, liquefaction, landslides, and other ground failures and hazards. This act requires the State Geologist to delineate various seismic hazard zones and requires cities, counties, and other local permitting agencies to regulate certain development projects within these zones. Before a development permit can be granted for a site within a seismic hazard zone, a geotechnical investigation of the site must be conducted and appropriate mitigation measures incorporated into the project design.

#### *CALIFORNIA BUILDING CODE*

The California Building Code (CBC), or the California Code of Regulations (CCRs), Title 24, Part 2, is a portion of the California Building Standards Code. Title 24 is assigned to the California Building Standards Commission, which, by law, is responsible for coordinating all building standards. Under state law, all building standards must be centralized in Title 24 or they are not enforceable. Published by the International Conference of Building Officials (ICBO), the Uniform Building Code (UBC) is a widely adopted model building code in the United States. The CBC incorporates by reference the UBC with necessary California amendments. Approximately one-third of the text within the CBC has been tailored for California earthquake conditions. As stated in Section 13 of the MOU between the Tribe and Placer County, “the Tribe shall adopt the building standards set out in all Uniform Building Codes, as adopted or supplemented by Placer County.” The MOU also specifies that, prior to the use of any structure constructed on trust land, the Tribe shall provide the County with written certification from the ICBO that the structures have been constructed in accordance with the applicable standards. Construction plans shall be submitted to the County after the final ICBO certification.

## 12.2.2 PLACER COUNTY

### *GENERAL PLAN*

The Placer County General Plan contains several goals and policies pertaining to geologic hazards and seismicity. The policies contained within the General Plan that are relevant to the proposed project include the preparation of soils engineering and geologic-seismic analysis prior to permitting development in areas prone to geological or seismic hazards; preparation of preliminary soils reports prior to project approval in areas where critically expansive soils are known or suspected; and minimization of hazards in seismically active areas through proper building location and design. The complete text of the relevant Placer County General Plan goals and policies related to geologic hazards and seismicity can be found in **Table 4-2** of this TEIR.

### *COUNTY STANDARDS AND REVIEW PROCESS*

Placer County has standards and specifications concerning grading, erosion control, inspection, and permitting that would apply to the offsite improvements associated with the proposed project. The Placer County Engineering and Surveying Department (ESD) requires and reviews Improvement Plans, grading permits, building permits, and drilling permits. Detailed erosion control and drainage measures are required for all Improvement Plans. Section 2 of the MOU between the Tribe and Placer County states that future development on the 49-acre project site shall be “subject to the County environmental review process and ordinances, County Plans, and County development standards, design guidelines and fees.”

## 12.3 IMPACTS

### SIGNIFICANCE CRITERIA

The following criteria have been used to determine the significance of geology, soils, and seismicity impacts. Additional potential impacts and mitigation measures related to soil erosion are discussed in **Chapter 13.0** of this document, which addresses hydrology and water quality.

An impact would be significant if it:

- Causes substantial erosion or slope failure;
- Causes construction on unstable, critically expansive, or corrosive soils;
- Exposes people or structures to major geologic hazards; or
- Prevents the recovery of significant mineral resources.

## CONSTRUCTION AND OPERATIONAL IMPACTS

<b>IMPACT 12.1:</b>	The proposed project could result in erosion or unstable slopes.
<b>SIGNIFICANCE:</b>	Potentially Significant
<b>MITIGATION:</b>	Mitigation Measures 12.1, 12.2, and 12.3
<b>RESIDUAL SIGNIFICANCE:</b>	Less than Significant

Construction of the proposed project would involve earthwork, grading, and disturbance to surface sediments in the project area. Additionally, construction-related earth-moving activities could result in bare or denuded soils being temporarily exposed to stormwater, potentially leading to erosion and loss of topsoil from the site. Mitigation Measures 12.1, 12.2, and 12.3 will ensure that construction activities minimize the potential for erosion or creation of unstable slopes and will reduce potential impacts to a less than significant level.

Potentially significant impacts from sediment-laden stormwater leaving the project site are further discussed within **Chapter 13.0**, which addresses hydrology and water quality.

<b>IMPACT 12.2:</b>	Soil conditions within the proposed project area could include unstable, corrosive, or critically expansive soils.
<b>SIGNIFICANCE:</b>	Potentially Significant
<b>MITIGATION:</b>	Mitigation Measures 12.4 and 12.5
<b>RESIDUAL SIGNIFICANCE:</b>	Less than Significant

Based upon the flat topography and the Fiddymment-Kaseberg soils encompassed by the proposed project, the potential for landslides, slope failures, or other mass movements, including seismically induced mass movement is considered very low.

Soils within the project area have a low shrink-swell potential, and are not classified as expansive soils (Fugro West, Inc., 2006). Soils on the project site are moderately corrosive, and could result in potentially significant effects to sub-grade piping. Implementation of Mitigation Measures 12.4 and 12.5 would reduce this impact to less than significant levels.

<b>IMPACT 12.3:</b>	Ground shaking, fault rupture, liquefaction, and other seismic effects from an earthquake could present a hazard to people or structures.
<b>SIGNIFICANCE:</b>	Less than Significant
<b>MITIGATION:</b>	None Warranted

The proposed project site is not located on any known active fault traces, and is not contained within an Alquist-Priolo Zone. No seismic hazards, including ground rupture, lateral spreading, lurching, etc. have

been documented within the area (Fugro West, Inc., 2006). The estimated peak ground acceleration (PGA) of 0.12 g would not contribute to significant seismic hazards.

The soils encountered on the project site consist of primarily very stiff to hard fine soils with density sufficient to preclude liquefaction or densification. Other geologic hazards, including slope instability, fault rupture, lateral spreading, or lurching, are unlikely due to the generally flat terrain and substantial distance from known active faults (Fugro West, Inc., 2006).

The proposed structures would conform to the seismic design criteria contained within the 2001 California Building Code (CBC). Conformance to these standards ensures that any potential risks associated with seismic hazards are minimized. Therefore, the potential for impacts related to seismic hazards are less than significant.

<b>IMPACT 12.4:</b>	Construction of the proposed project would prevent recovery of significant mineral resources.
<b>SIGNIFICANCE:</b>	Less than Significant
<b>MITIGATION:</b>	None Warranted

Construction of the proposed project would result in a portion of the existing casino site being disturbed and then developed, landscaped, or re-paved. Some improvements to adjacent areas, including Athens Avenue right of way and the temporary overflow parking lot, would also result in paving of additional ground surfaces (approximately 2 acres). However, no mineral resources are known to exist within the proposed project site. Therefore, potential impacts to mineral resources would be less than significant.

## 12.4 MITIGATION MEASURES

### **Mitigation Measure 12.1:** Prepare Improvement Plans for all Offsite Improvements

Mitigation Measure 12.1 applies to Impact 12.1

The Tribe shall prepare and submit Improvement Plans, specifications and cost estimates (per the requirements of Section II of the Land Development Manual (LDM) that are in effect at the time of submittal) to the ESD for review and approval of each project phase. The plans shall show all conditions for the project as well as pertinent topographical features within and adjacent to the Offsite Improvement Area. All existing and proposed utilities and easements, within and adjacent to the Offsite Improvement Area, which 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 Tribe shall pay plan check and inspection fees (NOTE: prior to 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 Tribe's responsibility to obtain all required agency

signatures on the plans and to secure department approvals. If the Design/Site Review process and/or DRC review is required, as a condition of approval for the project, said review process shall be completed prior to submittal of Improvement Plans. Record drawings shall be prepared and signed by a California Registered Civil Engineer at the Tribe's expense and shall be submitted to the ESD prior to acceptance by the County of the offsite improvements.

**Mitigation Measure 12.2:** Consistency with County Grading Ordinance  
Mitigation Measure 12.2 applies to Impact 12.1.

All proposed grading, drainage improvements, vegetation, tree impacts, and tree removal shall be shown on the Improvement Plans and all work shall be consistent with the County Grading Ordinance (Section 15.48, Placer County Code) and the Placer County Flood Control District's Stormwater Management Manual. The applicant shall pay applicable plan check fees and inspection fees. No grading, clearing, or tree disturbance shall occur on non-trust land until the Improvement Plans are approved and any required temporary construction fencing has been installed and inspected. All cut/fill slopes shall be at 2:1 (horizontal: vertical) unless a soils report supports a steeper slope.

All facilities and/or easements dedicated or offered for dedication to Placer County or to other public agencies which encroach on the project site or within any area to be disturbed by project construction shall be accurately located on the Improvement Plans.

All disturbed areas shall be revegetated. Revegetation undertaken from April 1 to October 1 shall include regular watering to ensure adequate growth. A winterization plan shall be provided with project Improvement Plans. Erosion control/winterization measures shall be properly installed and maintained during project construction.

For offsite improvements, a letter of credit or cash deposit in the amount of 110% of an approved engineer's estimate for winterization and permanent erosion control work shall be submitted to the County ESD prior to improvement plan approval. Upon the County's acceptance of offsite improvements, and satisfactory completion of a one-year maintenance period, unused portions of said deposit shall be refunded.

If, at any time during construction, a field review of offsite improvements 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 Development Review Committee (DRC)/ESD for a determination of substantial conformance to the project approvals prior to any further work proceeding. 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.

Any work affecting facilities maintained by, or easements dedicated or offered for dedication, to Placer County or other public agency may require the submittal and review of appropriate Improvement Plans by ESD or the other agency.

**Mitigation Measure 12.3:** Geotechnical Engineering Report

Mitigation Measure 12.3 applies to Impact 12.1.

A geotechnical engineering report for the offsite improvement area produced by a California Registered Civil Engineer or Geotechnical Engineer shall be submitted to the County Engineering and Surveying Department (ESD) for review. The report shall address and make recommendations on the following:

- Road, pavement, and parking area design
- Structural foundations, including retaining wall design (if applicable)
- Grading practices
- Erosion/winterization
- Special problems discovered on-site, (i.e., groundwater, expansive/unstable soils, etc.)
- Slope stability

**Mitigation Measure 12.4:** Amend or replace unsuitable soils

Mitigation Measure 12.4 applies to Impact 12.2.

Some of the soils on the site are moderately corrosive. Use of appropriate coated pipelines and other corrosivity-resistant building materials shall be incorporated into the project design.

**Mitigation Measure 12.5:** Use suitable soils and construction materials

Mitigation Measure 12.5 applies to Impact 12.2.

Imported soils and construction materials shall be determined to be suitable for the specified application by a licensed professional employing geotechnical/soils laboratory testing standards according to standard engineering practices and the California Building Code.