5.4 GEOLOGY AND SOILS

5.4.1 INTRODUCTION

This section describes the existing geologic and soils conditions as they relate to the implementation of the Riverwalk Marketplace Phase II Project. In addition to information contained in the City of Porterville 2030 General Plan, the following studies were used to prepare this analysis:

- *Soil Investigation, Proposed Riverwalk Marketplace, Porterville, California*. Prepared by Consolidated Testing Laboratories, Inc., dated October 30, 2006. (The soil investigation is provided in **Appendix 5.4** of this draft EIR.
- City of Porterville 2030 General Plan Draft Environmental Impact Report, November 2007.

5.4.2 SUMMARY OF 2030 GENERAL PLAN EIR FINDINGS

Potential seismic impacts associated with implementation of the 2030 General Plan largely includes ground shaking, soil slumping, and landslides in the hillside areas.[1] Ground failure (e.g., liquefaction, lateral spreading, ground lurching, seiches, or mudslides) caused by ground shaking is considered unlikely to occur in Porterville because of its relatively stable geologic formation. No Alquist-Priolo Earthquake Fault Zones or known active faults are in or near Porterville; consequently, no impacts from fault-line surface rupture are anticipated.

Most of the City's planning area, approximately 93 percent, is considered to have soils with moderate to high shrink-swell characteristics. Areas in Porterville with steeply sloping topography are highly susceptible to soil erosion, which most notably occurs during construction and grading activities. Areas within the planning area have been identified to contain serpentine soils or ultramafic rock, which contains asbestos. Policies in the proposed general plan include implementation measures to reduce the risk of exposure to naturally occurring asbestos.

5.4.3 EXISTING CONDITIONS

Regional Setting

Porterville is situated along the western slope of a northwest-trending belt of rocks comprising the Sierra Nevada and within the southern portion of the Cascade Range. The Sierra Nevada geomorphic province is primarily composed of cretaceous granitic plutons and remnants of Paleozoic and Mesozoic metavolcanic and metasedimentary rocks, and Cenozoic volcanic and sedimentary rocks. The majority of

1 City of Porterville, *2030 General Plan Draft Environmental Impact Report*, November 2007, 159.

the City of Porterville has elevations ranging between 400 and 800 feet; however, the eastern portion is in the Sierra Nevada foothills where elevations reach almost 1,800 feet above sea level.[2]

Seismicity

There are no known active earthquake faults in the City of Porterville.[3] The nearest active faults are the Owens Valley fault group (40 miles to the east), White Wolf fault (56 miles to the south), and San Andreas (70 miles to the west) fault. Twenty-four major earthquakes, such as the 1906 San Francisco, 1952 Kern County, and 1983 Coalinga quakes, caused some minor to moderate property damage in the City. Other potentially active faults exist near Tulare Buttes, about 30 miles north of Porterville. These faults are small and have exhibited activity in the last 1.6 million years, but not in the last 200 years. It is possible, but unlikely, that previously unknown faults could become active in the area.

No Alquist-Priolo Earthquake Fault Zones are in or near Porterville. Porterville is located in Seismic Zone 3 of the 1994 Uniform Building Code (UBC).[4] This zone is expected to experience moderate effects from earthquake ground shaking.[5]

Ground Shaking

Porterville is located in a seismic zone which is sufficiently far from known faults and consists primarily of a stable geological formation.[6] Hazards due to ground shaking are considered to be minimal.[7] Ground shaking intensities are measured using the modified Mercalli Intensity Scale. This is a 12-point scale (I-XII) of earthquake intensity based on local effects experienced by people, structures, and earth materials. Effects range from those that are detectable only by seismicity recording instruments (MM I) to total destruction (MM XII).

The Modified Mercalli Rating for the Porterville area, as determined by the California Division of Mines and Geology, is estimated to be between Intensity MM VII and MM VIII.[8] Intensity MM VII will cause considerable damage in poorly designed or constructed buildings (including some broken chimneys), slight to moderate damage in well-built ordinary structures, and negligible damage in buildings of good design and construction. Intensity MM VIII will cause great damage in poorly designed or constructed

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2 City of Porterville, *2030 General Plan Draft Environmental Impact Report*, November 2007, 147.

3 Ibid., 148.

4 California Code of Regulations, Title 24, Part 2, California Building Standards Commission, *2007.*

5 City of Porterville, *2030 General Plan Draft Environmental Impact Report*, November 2007, 148.

6 Ibid.

7 Ibid.

8 City of Porterville, *2030 General Plan*, "Land Use, Conservation, and Safety Element," (1998), 2-5.

buildings (including fall of chimneys, factory stacks, columns, walls, etc.), considerable damage in ordinarily substantial structures (including some partial collapse), but slight damage in specially designed structures.

Surface Fault Rupture

Seismically induced ground rupture is defined as the physical displacement of surface deposits in response to an earthquake's seismic waves. The magnitude and nature of fault rupture can vary for different faults or even along different strands of the same fault. Surface rupture can damage or collapse buildings, cause severe damage to roads and other paved areas, and cause failure of overhead and underground utilities. Future faulting is generally expected along different strands of the same fault. Ground rupture is considered more likely along active faults. As no active faults are known to be present in the City of Porterville, the likelihood of fault rupture is minimal.[9]

Liquefaction

Liquefaction is a phenomenon whereby unconsolidated and/or near-saturated soils lose cohesion and are converted to a fluid state as a result of severe vibratory motion. Areas prone to liquefaction are water saturated (where the water table is 30 feet below the surface) and underlain by unconsolidated, loose, granular materials. The relatively rapid loss of soil shear strength during strong earthquake shaking results in temporary, fluid-like behavior of the soil. Soil liquefaction causes ground failure that can damage roads, pipelines, underground cables, and buildings with shallow foundations. As Porterville is sufficiently far from known faults and consists primarily of a stable geological formation, effects from seismically induced liquefaction are believed to be minimal.[10]

Lateral Spreading, Ground Lurching, Seiches, Mudslides, and Landslides

Ground failures caused by ground shaking—liquefaction, lateral spreading, ground lurching, seiches, mudslides or landslides—are considered unlikely to occur in Porterville because of its relatively stable geologic formation.[11] However, there is moderate risk of landslides due to the hillside topography, and soil slumping near the Tule River. There is also the risk of earthquake-induced dam failure at Success Dam.[12] Potential inundation effects are discussed in **Section 5.5, Hydrology and Water Quality**.

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9 City of Porterville, *2030 General Plan Draft Environmental Impact Report*, November 2007, 150.

10 Ibid.

11 Ibid.

12 Ibid.

Existing structures in the City could be affected by the types of earthquake-induced effects listed above, but to varying degrees based on length, intensity, and distance of the earthquake from a given building. New structures are required to adhere to current UBC standards for Seismic Zone 3, providing adequate design, construction, and maintenance of structures to prevent exposure of people and structures to major geologic hazards.[13]

Slope Failure

A landslide is a mass of rock, soil, and debris displaced down slope by sliding, flowing, or falling. Ground failure is dependent on topography and underlying geologic materials, as well as factors such as rainfall, excavation, or seismic activities which can precipitate slope instability. Steep slopes and downslope creep of surface materials characterize areas most susceptible to landslides.[14]

The majority of the urban area is at elevations between 400 and 800 feet. However, the eastern portion of the City is in the Sierra Nevada foothills, where elevations reach almost 1,800 feet above sea level, and slopes can be greater than 30 percent grade. Areas with fractured, steep slopes, where less consolidated or weathered soils overlie bedrock, have a higher risk of landslides. The project site is not in an area susceptible to slope failure or landslides.[15]

Erosion

Soil erosion is a process whereby soil materials are worn away and transported to another area, either by wind or water. Rates of erosion can vary depending on the soil material and structure, placement, and human activity. Soil containing high amounts of silt can be easily eroded, while sandy soils are less susceptible. Excessive soil erosion can eventually damage building foundations and roadways. Erosion is most likely to occur on sloped areas with exposed soil, especially where unnatural slopes are created by cut-and-fill activities. Soil erosion rates can be higher during construction activities. Typically, the soil erosion potential is reduced once the soil is graded and covered with concrete, structures, or asphalt.

Soils in the City of Porterville that are highly susceptible to erosion include areas of steeply sloping topography, particularly where vegetation and superficial material has been stripped for construction purposes.[16]

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13 City of Porterville, *2030 General Plan Draft Environmental Impact Report*, November 2007, 150.

14 Ibid., 153.

15 Ibid., Figure 3.8-1, "Geologic Hazards and Mineral Resources."

16 City of Porterville, *2030 General Plan Draft Environmental Impact Report*, November 2007, 153

The project site is in an area that has a high potential for susceptibility to erosion as identified in the 2030 General Plan.[17] For this analysis the soil characteristics of the project site were identified using two methods: a web soil survey of the site using Natural Resource Conservation Service (NRCS) web site,[18] and the soils investigation.[19]

The NRCS web soils survey determined that the project site consisted of two soils: San Emigdio loam, which covers approximately 82 percent of the site, and Tujunga sand, which covers approximately 18 percent of the site. San Emigido loam is a fine sandy loam soil which is well drained and has a K factor [20]of 0.32,[21] which falls within the category of high erosion potential as defined in the 2030 General Plan.[22] The Tujunga sand is a soil (sand) that is somewhat excessively drained and has a K factor of 0.17,[23] which falls within the category of low erosion potential as defined in the 2030 General Plan.[24]

The soils investigation conducted soil borings throughout the project site. Subsurface soils on the project site consist of sand, sandy silt, and silty sand. The upper surface soil is generally a loose to medium dense sandy silt or silty sand extending to depths ranging from 3 to 10 feet below grade, underlain by sand and gravelly sand with some silty sand and sandy silt to a depth of 50 feet below grade.[25] As the soils investigation[26] was site specific, and determined that the subsurface soils contain sand, sandy silt, and silty sand, it is clear that the project site contains both the Emigido loam and Tujunga sand Series. Therefore, the project site consists mainly of soils with a high potential for erosion.

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17 Ibid., Figure 3.8-1, "Geologic Hazards and Mineral Resources."

18 U.S. Department of Agriculture, Natural Resource Conservation Service, "Web Soil Survey," http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx., 2009.

19 Consolidated Testing Laboratories, Inc., *Soil Investigation, Proposed Riverwalk Marketplace, Porterville, California*, October 30, 2006.

20 K factor is an empirical measure of soil erodibility as affected by intrinsic soil properties.

21 Ibid., USDA-NRCS Official Soil Series Description Query Facility, "San Emigido Series," http://www2.ftw.nrcs.usda.gov/osd/dat/S/SAN_EMIGDIO.html, 2009.

22 City of Porterville, *2030 General Plan*, "Public Health and Safety Element," Figure 7-1, "Geologic and Soils Hazards."

23 Ibid, "Tujunga Series," http://www2.ftw.nrcs.usda.gov/osd/dat/T/TUJUNGA.html, 2009.

24 City of Porterville, *2030 General Plan*, "Public Health and Safety Element," Figure 7-1,, "Geologic and Soils Hazards."

25 Consolidated Testing Laboratories, Inc., *Soil Investigation, Proposed Riverwalk Marketplace, Porterville, California*, October 30, 2006, 2.

26 Soil Investigation, *Proposed Riverwalk Marketplace, Porterville, California. Prepared by Consolidated Testing Laboratories, Inc.*, dated October 30, 2006, 2.

Expansive Soils

Expansive soils possess a "shrink-swell" characteristic. Shrink-swell is the cyclic change in volume (expansion and contraction) that occurs in fine-grained clay sediments from the process of wetting and drying. Structural damage may occur over a long period of time, usually the result of inadequate soil and foundation engineering, or the placement of structures directly on expansive soils. The project site is not in an area that has expansive soils.[27]

Groundwater

Groundwater was located at depths of 21 to 26 feet below grade, but historically has been higher.[28] Groundwater levels fluctuate due to variations in precipitation, land use, irrigation, and other factors. Higher groundwater levels can increase the risk of liquefaction and may require dewatering operations for projects that contain deeper subsurface excavations.

5.4.4 REGULATORY PLANS AND POLICIES

Federal

Since the project site is over 1 acre in size, a General Permit for Discharges of Storm Water Associated with Construction Activity (General Construction Permit) is required by the Regional Water Quality Control Board (RWQCB), as part of the National Pollution Discharge Elimination System (NPDES). The permit requires the project applicant to prepare and submit a Storm Water Pollution Prevention Plan (SWPPP) to be administered to control erosion and the discharge of other pollutants into the storm water system during construction of the project. The SWPPP must list best management practices (BMPs) that will be used to protect storm water runoff.

State

Seismic Hazards Mapping Act

Under the Seismic Hazards Mapping Act,[29] the State Geologist is responsible for identifying and mapping seismic hazards zones as part of the California Geologic Survey (CGS). The CGS provides zoning maps of non-surface rupture earthquake hazards (including liquefaction and seismically induced landslides) to local governments for planning purposes. These maps are intended to protect the public

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27 City of Porterville, *2030 General Plan Draft Environmental Impact Report*, November 2007, Figure 3.8-1, "Geologic Hazards and Mineral Resources."

28 Ibid.

29 California Public Resources Code, Article 10, Seismic Hazards Mapping. Updated May 2003.

from the risks associated with strong ground shaking, liquefaction, landslides or other ground failure, and other hazards caused by earthquakes. For projects within seismic hazard zones, the Seismic Hazards Mapping Act requires developers to conduct geological investigations and incorporate appropriate mitigation measures into project designs before building permits are issued.

Alquist-Priolo Earthquake Fault Zoning

The purpose of Alquist-Priolo Earthquake Fault Zoning Act[30] (formerly called the Alquist-Priolo Special Studies Zones Act) is to prohibit the location of most structures for human occupancy across the traces of active faults and to mitigate the hazard of fault-rupture. The act has been amended 10 times. Under the act, the State Geologist is required to delineate "earthquake fault zones" (EFZs) along known active faults in California. Cities and counties affected by the zones must regulate certain development projects within the zones. They must withhold development permits for sites within the zones until geologic investigations demonstrate that the sites are not threatened by surface displacement from future faulting.

California Building Code

The California Building Code (CBC)[31] is administered by the California Building Standards Commission, which, by law, is responsible for adopting, approving, publishing, and implementing California's building codes and standards. The purpose of the CBC is to establish minimum standards for safeguarding public health and safety through structural strength, means of egress facilities, and general stability by regulating and controlling the design, construction, quality of materials, use and occupancy, location, and maintenance of all building and structures within its jurisdiction.

The California Building Standards Code,[32] which includes the CBC, the California Electrical Code, and the California Plumbing Code, among others, is based on the International Building Code, with the addition of necessary California amendments based on the American Society of Civil Engineers Minimum Design Standards 7-05.[33] The California Building Standards Code establishes requirements for general structural design and methods for determining earthquake loads, as well as other loads (flood, snow, wind, etc.), for inclusion in building codes. The provisions of the California Building Standards Code apply to the construction, alteration, movement, replacement, and demolition of every building or

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30 California Public Resources Code, Chapter 7.5, Earthquake Fault Zone, Alquist-Priolo Earthquake Fault Zoning Act.

31 California Code of Regulations, Title 24, Part 2, California Building Standards Code, California Building Standards Commission, *2007*.

32 California Code of Regulations, Title 24, Part 2, California Building Standards Code, California Building Standards Commission, *2007*.

33 American Society of Civil Engineers, *Minimum Design Loads for Buildings and Other Structures, SEI/ASCE 7-05* (2006).

structure, and any connected appurtenances, throughout California. The 2007 California Building Standards Code is based on the 2006 International Building Code.[34]

Earthquake design requirements take into account the occupancy category of a structure, site class, soil classifications, and various seismic coefficients, which are used to determine the appropriate Seismic Design Category[35] for a project. The Seismic Design Category is a classification system that combines occupancy categories with the level of expected ground motions at the site; categories range from Seismic Design Category 1 (very small seismic vulnerability) to Seismic Design Category 4 (very high seismic vulnerability and near a major fault). Design specifications for the structure are then determined according to the applicable Seismic Design Category. The project site is located in Seismic Design Category 3.[36]

Local

City of Porterville 2030 General Plan

Applicable policies from the City's 2030 General Plan are listed below:[37]

PHS-I-1 Amend the Zoning Ordinance to include provisions for a geologic hazards abatement district for hillside areas to ensure that geologic hazards are properly mitigated by developers or avoided prior to, or during, development.

Geologic Hazard Abatement Districts are potentially useful financing mechanisms for reducing hill slope hazards. They enable the formation of local assessment districts for the purpose of prevention, mitigation, abatement, or control of geologic hazards, allowing property owners to cooperate in solving a common problem and share costs in an equitable way. These districts are established on individual sites on a case-by-case basis through Zoning Map amendments.

PHS-I-2 Maintain and enforce appropriate building standards and codes to avoid and/or reduce risks associated with geologic constraints and to ensure that all new construction is designed to meet current safety regulations.

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34 International Code Council, International Building Code, 2006.

35 California Code of Regulations, Title 24, Part 2, California Building Standards Code, California Building Standards Commission, *2007*.

36 City of Porterville, *2030 General Plan*, "Public Health and Safety Element," 159.

37 Ibid., 160.

PHS-I-3 Provide information and incentives for property owners to rehabilitate existing buildings using construction techniques to protect against seismic hazards.

PHS-I-4 Support continued investigation by state agencies of geologic conditions within the City's Planning Area to promote public awareness of potential geologic and seismic hazards.

PHS-I-5 Require, as part of the preliminary soil report, a construction dust management plan when it has been determined that soils contain naturally occurring asbestos.

PHS-I-6 If asbestos is present required construction work be done when soil moisture is sufficient to adequately compact the tread and prevent visible dust, which may contain airborne asbestos emissions.

If work is to be done under dry season conditions, then water will be added in sufficient quantities to maintain adequate soil moisture. Upon mechanical disturbance by the treads of track driven equipment, the soil will be recompacted in 6-inch or less lifts.

5.4.5 THRESHOLDS OF SIGNIFICANCE

Appendix G of the *State CEQA Guidelines*[38] contains the Initial Study Environmental Checklist form. Issues presented in the checklist have been utilized as thresholds of significance in this section. Accordingly, a project may present a significant impact if it would

- expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:
  - rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.
  - strong seismic ground shaking.
  - seismic-related ground failure, including liquefaction.

  (This criterion was removed from further consideration during preparation of the Initial Study);
- result in substantial soil erosion or the loss of topsoil, or
- be located on a geologic unit or soil that is unstable, or that would become unstable because of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse. (*This criterion was removed from further consideration during preparation of the Initial Study)*;

38 California Environmental Quality Act, *State CEQA Guidelines*, Appendix G, 2009, 277–291.

- be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property or other problematic soils. (*This criterion was removed from further consideration during preparation of the Initial Study)*; or

- have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater. (*This criterion was removed from further consideration during preparation of the Initial Study).*

5.4.6 PROJECT IMPACTS

Impact 5.4-1: The project will not result in substantial soil erosion or the loss of topsoil. ***Impacts would be less than significant.***

Soils in the City of Porterville that are highly susceptible to erosion are found in areas of steeply sloping topography, particularly where vegetation and superficial material has been stripped for construction purposes.[39] The project site is an area that has a high susceptibility to erosion as identified in the 2030 General Plan.[40] For this analysis, the soil characteristics of the project site were identified using two methods: a web soil survey of the site using Natural Resource Conservation Service (NRCS) Web site,[41] and the soils investigation.[42]

The NRCS web soils survey determined that the project site consisted of two soils: San Emigdio loam, which covers approximately 82 percent of the site, and Tujunga sand, which covers approximately 18 percent of the site. San Emigido loam is a fine sandy loam soil that is well drained and has a K factor[43] of 0.32,[44] which falls within the category of high erosion potential as defined in the 2030 General Plan.[45] The Tujunga sand is a soil (sand) that is well drained and has a K factor of 0.17,[46] which falls within the category of low erosion potential as defined in the 2030 General Plan.[47]

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39 City of Porterville, *2030 General Plan*, "Public Health and Safety Element," 153.

40 Ibid., Figure 3.8-1, "Geologic Hazards and Mineral Resources."

41 U.S. Department of Agriculture, Natural Resource Conservation Service, "Web Soil Survey," http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx., 2009.

42 *Soil Investigation, Proposed Riverwalk Marketplace, Porterville, California*. Prepared by Consolidated Testing Laboratories, Inc., October 30, 2006.

43 K factor is an empirical measure of soil erodibility as affected by intrinsic soil properties.

44 Ibid., USDA-NRCS Official Soil Series Description Query Facility, "San Emigido Series," http://www2.ftw.nrcs.usda.gov/osd/dat/S/SAN_EMIGDIO.html, 2009.

45 City of Porterville, *2030 General Plan*, "Public Health and Safety Element," Figure 7-1, "Geologic and Soils Hazards."

46 Ibid., "Tujunga Series," http://www2.ftw.nrcs.usda.gov/osd/dat/T/TUJUNGA.html, 2009.

47 City of Porterville, *2030 General Plan*, "Public Health and Safety Element," Figure 7-1, "Geologic and Soils Hazards."

The soils investigation conducted soil borings throughout the project site. Subsurface soils on the project site consist of sand, sandy silt, and silty sand. The upper surface soil is generally a loose to medium dense sandy silt or silty sand extending to depths ranging from 3 to 10 feet below grade, underlain by sand and gravelly sand with some silty sand and sandy silt to a depth of 50 feet below grade.[48] As the soils investigation[49] was site specific, and determined that the subsurface soil contain sand, sandy silt, and silty sand, it is clear that the project site contains both the Emigido loam and Tujunga sand series. Therefore, the project site consists mainly of soils with a high potential for erosion.

Construction of the proposed project would not require significant amounts of soil to be imported or exported to the site as the site is relatively flat, has been disced annually for week abatement, and a series of off-site improvements to Riverwalk Marketplace Phase I, including drainage and road improvements for Vandalia Avenue have occurred. Construction activity may result in wind- and water-driven erosion of soils due to grading activities if soil is stockpiled or exposed during construction. This impact would be considered short term in nature and the potential for erosion would end after construction is finished.

As discussed in **Section 5.5, Hydrology and Water Quality**, to reduce or eliminate construction-related water quality effects, the City of Porterville would require future contractors to obtain coverage under the NPDES General Construction Permit and include erosion and sediment control plans. As a performance standard, the General Construction Permit requires controls of pollutant discharges, including sediments from erosion, that use best available technology (BAT) that is economically achievable, best conventional pollutant control technology (BCT) to reduce pollutants, and any more stringent controls necessary to meet water quality standards. BMPs may consist of a wide variety of measures taken to reduce erosion.

Measures range from source controls, such as reduced surface disturbance, to treatment of polluted runoff, such as with detention or retention basins. BMPs to be implemented as part of the General Construction Permit may include, but are not limited to, the following measures:

- Temporary erosion and sediment control measures (such as straw mulch and tackifier, silt fences, staked wattles, silt/sediment basins and traps, check dams, geofabric, and temporary revegetation or other ground cover) will be employed to control erosion and sedimentation from disturbed areas.
- Drainage facilities in downstream off-site areas will be protected from sediment using temporary structural BMPs, such as sediment barriers, erosion control blankets, mulch, and mulch tackifier, may be installed as needed to stabilize disturbed areas until vegetation becomes established.

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48 Consolidated Testing Laboratories, Inc., *Soil Investigation, Proposed Riverwalk Marketplace, Porterville, California*, October 30, 2006, 2.

49 Ibid.

- Grass or other vegetative cover or other approved erosion control measures will be established on the construction site as soon as possible after disturbance. No disturbed surfaces will be left without erosion control measures in place.

The project site's flat topography coupled with the implementation of the NPDES General Construction Permit would reduce the project's impacts on erosion to less than significant.

Upon completion of construction, the project site would be covered with structures, pavement and landscaping, and therefore no soil erosion would occur during project operation. Operational Impacts would be less than significant.

Mitigation Measures

No mitigation measures are required.

Residual Impacts

Impacts would be less than significant.

5.4.7 CUMULATIVE IMPACTS

Impact 5.4-2 **Buildout of the 2030 General Plan would result in development in areas that contain soils with moderate to high shrink swell potential and are susceptible to erosion.** ***These impacts are considered less than significant.***

Potential geologic hazards associated with the proposed project are site-specific and would not represent a cumulative impact. Implementation of the proposed project and other projects in the City would cumulatively increase the number of structures and people exposed to geologically and seismically related hazards and soil erosion concerns. All projects would be subject to the requirements of the NPDES permit. As long as the design and construction of related projects occur consistent with proper engineering practices and adhere to the requirements of applicable portions of the CBC and Municipal Code, impacts related to geologic hazards and soils would be less then significant.

Cumulative Mitigation Measures

No mitigation measures are required.

5.4.8 LEVEL OF SIGNIFICANCE AFTER MITIGATION

Impacts would be less than significant.