5.12 Soils

This section addresses soil-related issues associated with the Blythe Solar Power Project (BSPP or Project). It discusses applicable laws, ordinances, regulations, and standards (LORS), required permits, and potential soils-related hazards and impacts associated with the Project and identifies proposed mitigation measures.

The soils discussion in this section is intended to support California Energy Commission (CEC) compliance with the requirements of the California Environmental Quality Act (CEQA) and Bureau of Land Management's (BLM) compliance with the requirements of the National Environmental Policy Act (NEPA). These agencies are conducting a joint review of the Project, and a combined NEPA/CEQA document will be prepared.

Please note that limited soils data are available for the Project site and that soils maps and other detailed data are being developed as part of an ongoing preliminary geotechnical investigation. These data will be provided to the regulatory agencies and stakeholders when the investigation has been completed. The preliminary geotechnical investigation report will be appended to the Application for Certification (AFC) and will contain the data and detailed analyses used to evaluate site soils.

Summary

The Project would not have significant impacts on soils. The Project is not located on agricultural lands, there is little likelihood of encountering contaminated soils during construction, and there will be no import or export of fill material. Limited soils data is available from any known source for the Project site and the Applicants are developing soils maps and other detailed soils data as part of the ongoing preliminary geotechnical investigation program. These data will be provided to the regulatory agencies and other stakeholders when the preliminary geotechnical investigation is complete.

The site will be graded as part of construction. With the implementation of best management practices (BMPs), such as soil compaction, dust suppression, straw bales, and silt fences, as well as limiting exposed areas, impacts during construction would be less than significant. Likewise, BMPs and dust control measures will be implemented to minimize water and wind erosion impacts during Project operation. BMPs will be provided in the Storm Water Pollution Prevention Plan (SWPPP) and Draft Erosion and Sedimentation Control Plan (DESCP) required for the Project. A preliminary construction SWPPP/DESCP is provided in Appendix L.

5.12.1 LORS Compliance

Federal, state, and local LORS that apply to soils affected by the Project are summarized in Table 5.12-1 and discussed in the text following the table. Non-applicable federal and state LORS are also discussed, and justification for eliminating these LORS from further evaluation is provided.

Table 5.12-1 Summary of Applicable Soils LORS

LORS	Applicability	Where Discussed in AFC
Federal:		
USDA Engineering Standards, Natural Resources Conservation Service (1983), National Engineering Handbook, Sections 2 and 3	Provides standards for soil conservation.	Section 5.12.1
Clean Water Act (CWA), 33 U.S.C. Section 12571et seq.	Regulates both direct and indirect discharges, including storm water discharges from construction and industrial activities. Establishes protection of navigable waters through Section 401. Section 401 certification, obtained from the Regional Water Quality Control Board (RWQCB) is required if there are potential impacts to surface waters of the State and/or Waters of the United States, such as perennial and ephemeral drainages, streams, washes, ponds, pools and wetlands. Section 401 requires impacts to these waters to be quantified and mitigated. The quality of waters of the U.S. are protected through Section 402 of the CWA, which regulates wastewater and storm water discharges through the National Pollutant Discharge Elimination System (NPDES). Activities resulting in the dredging or filling of jurisdictional waters of the U.S., which can include drainages and ephemeral washes, require authorization under a Section 404 Permit issued through the U.S. Army Corps of Engineers.	Section 5.12.1.1
State:		
California Porter-Cologne Water Quality Act, California Water Code Section 13000 et seq.	A National Pollution Discharge Elimination System (NPDES) California General Activities Construction Permit is necessary if an area greater than one acre will be disturbed. Industrial facilities (including power plants) with potential to affect storm water discharges are required to obtain an NPDES permit during operation (Industrial Storm Water General Permit).	Section 5.12.1.2

Table 5.12-1 Summary of Applicable Soils LORS

LORS	Applicability	Where Discussed in AFC
California Storm Water Permitting Program: California Construction Storm Water Program, California Industrial Storm Water Program SWRCB WQO 99-08	Construction activities that disturb equal to or greater than one acre are required to be covered under California's General Construction Permit, which requires the development and implementation of a SWPPP. Industrial activities with the potential to impact storm water discharges are required to be covered under a NPDES permit for those discharges and requires implementation of a SWPPP.	Section 5.12.1.2
SWRCB Resolution 77-1	Resolution encourages and promotes recycled water use for non-potable purposes.	Section 5.12.1.2
Local:		
Riverside County Ordinance Code 457	Riverside County requires a grading permit when at least 50 cubic yards of earth is cut, filled, or imported on a site.	Section 5.12.1.3
Riverside County Flood Hazard Zone Ordinance Code 458.13	Riverside County requires a development permit prior to any construction or other development within any area of special flood hazards and requires that flood capacity of any altered watercourse be maintained.	Section 5.12.1.3
Riverside County General Plan	Provides land use designations, goals, and policies for the development and conservation of non-federal land within the unincorporated areas of Riverside County.	Section 5.12.1.3
Riverside County Zoning Ordinance	Assigns zones to land within the unincorporated areas of Riverside County, describes land uses allowed within each zone, and generally includes direction for implementing the Riverside County General Plan.	Section 5.12.1.3

5.12.1.1 Federal LORS

Clean Water Act, 33 USC Section 1251 et seq.

The Federal Water Pollution Control Act of 1972, commonly referred to as the Clean Water Act following amendment in 1977, establishes requirements for discharges of stormwater or waste water from any point source that would affect the beneficial uses of waters of the United States. The State Water Resources Control Board (SWRCB) adopted statewide NPDES general permits that apply to stormwater discharges associated with construction, industrial, and municipal activities. The Regional Water Quality Control Board (RWQCB) is the administering agency for the NPDES permit program. The Project would comply with the Clean Water Act through the preparation and implementation of a Construction and Industrial SWPPP.

USDA Engineering Standards

The U.S. Department of Agriculture, Natural Resources Conservation Service (NRCS), *National Engineering Handbook*, 1983, Sections 2 and 3 provide standards for soil conservation during planning, design, and construction activities. The Project would need to conform to these standards during grading and construction to limit soil erosion.

The Farmland Protection Policy Act Sections 1539 to 1549

The Farmland Protection Policy Act (FPPA) of 1981 was enacted to identify and protect the nation's farmlands. The purpose of the Act is to preserve agricultural and open space lands by discouraging premature and unnecessary conversion to urban uses. The Act creates an arrangement whereby private landowners contract with counties and cities to voluntarily restrict land to agricultural and open-space uses.

The FPPA is not applicable to the Project because the Project is not located on farmlands. The Project site is currently vacant, undeveloped desert land. The Applicant proposes to lease these Federal lands from the BLM to develop the Project.

5.12.1.2 State LORS

The Williamson Act

The Williamson Act was passed by the California Legislature in 1965 to preserve agricultural and open space lands by discouraging premature and unnecessary conversion to urban uses. The Act creates an arrangement whereby private landowners contract with counties and cities to voluntarily restrict land to agricultural and open-space uses. The Williamson Act is not applicable because the Project is not located on agricultural lands, including lands that are protected under the Act.

Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act of 1967, Water Code Section 13000 et seq., requires the SWRCB and the nine RWQCBs to adopt water quality criteria to protect State waters. Those criteria include the identification of beneficial uses, narrative and numerical water quality standards, and implementation procedures. Water quality criteria for the Project area are contained in the Water Quality Control Plan for the Colorado Desert Basin Region (Basin Plan) which was adopted in 2006 and is in the process of being amended. This plan sets numerical and/or narrative water quality standards controlling the discharge of wastes to the State's waters and land.

A disturbance of greater than one acre during construction requires a California General Permit for Storm Water Discharges Associated with Construction Activity and thus the Project will require an NPDES Permit-California General Construction Activity Storm Water Permit prior to discharge of storm water (also see Section 5.17, Water Resources). A key feature of the requirements under this permit is the management of erosion and soil movement. Industrial facilities in California with the potential to impact stormwater discharges during operations, such as the Project, are required to obtain an NPDES Permit-Industrial Storm Water General Permit (SWRCB Order 97-03 DWQ) to ensure proper management and reduction of potential pollutants in runoff. In addition to the Federally-mandated SWPPP, the CEC requires a DESCP, which addresses the same issues. Appendix L contains a preliminary construction SWPPP/DESCP.

5.12.1.3 Local LORS

Uniform Building Code – Grading: Riverside County Ordinance Code 457, Section 3309 et seq.

The Project is subject to the Riverside County's Department of Building and Safety requirements for building and grading permits. The flood development permit is for development in areas within special flood hazards. According to the Riverside County General Plan (Riverside County 2000) the Project site and surrounding lands do not lie within a 100-year or 500-year flood plain, so a flood development permit is not needed.

A study of soil conditions at the Project site is currently being performed by the Applicant to assess existing conditions such as soil type, soil compaction, liquefaction potential, and potential for soil erosion. The study will include mitigation measures that are necessary to meet the standards required in the Grading Code. The report will be provided upon completion to the appropriate CEC and BLM staff.

Regulating Flood Hazard Areas: Riverside County Ordinance Code 458.13

The Riverside County Flood Hazard Zone Ordinance requires a permit for development activity within a designated flood zone. The ordinance requires that the flood carrying capacity of the altered or relocated portion of any watercourse or floodplain shall be maintained.

A study of hydrologic conditions at the Project site has been performed by the Applicants to assess the existing drainage flow conditions. The study includes proposed mitigation measures to meet the standards required by this ordinance. The hydrology/drainage report is provided in Appendix L.

Riverside County General Plan

The Riverside General Plan (adopted October 7, 2003) describes the future growth and development within the County over the long term. It acts as a constitution for both public and private development, setting forth County land use policies and implementation measures. All private parcels on the Project site are designated in the Riverside County General Plan with a Foundation Component of Open Space and an Area Plan Land Use Designation of Open Space Rural. The private parcels (and BLM property) are located in Zone E of the Blythe Airport Influence Zone.

5.12.1.4 Involved Agencies

The agency contacts for grading, building, NPDES, and floodplain development permits are identified in Table 5.12-2.

Table 5.12-2 Agencies and Agency Contacts

Contact	Phone/Email	Permit/Issue
John Carmona Water Resources Control Engineer Colorado River Basin RWQCB Palm Desert Office 73-720 Fred Waring Dr., Suite 100 Palm Desert, CA 92260	(760) 340-4521 JCarmona@waterboards.ca.gov	Waste Discharge Requirements (WDR), NPDES and Storm Water Permits, CWA 401
Scott Arnold Riverside County Planning Department 4080 Lemon Street Riverside, CA 92502-1629	(951) 955-1852 rscott@co.riverside.ca.us	Large scale (non-residential) grading permits, flood hazard areas permit

5.12.1.5 Required Permits and Permit Schedule

Following is a listing of soil related permits that will be required by the PSPP.

Table 5.12-3 Permits Required and Permit Schedule

Permit/Approval	Schedule
California General Permit for Storm Water Discharge Associated with Construction (NPDES Permit)	A Notice of Intent (NOI) application will be submitted 30 days prior to the start of construction.
California General Permit for Storm Water Discharge Associated with Industrial Activities (NPDES Permit)	A Notice of Intent (NOI) application will be submitted 30 days prior to the start of construction.
Riverside County Building Permit	Building permit applications will be submitted six weeks prior to the start of construction.
Riverside County Grading Permit	A grading plan and permit application will be submitted six weeks prior to the start of construction.
Riverside County Flood Plain Development Permit	Flood plain development permit application will be submitted six weeks prior to the start of construction.

5.12.2 Affected Environment

This subsection discusses baseline soil and agricultural conditions at the Project site. Physical soil properties and the potential for contaminated soils are discussed.

5.12.2.1 Regional Setting

The BSPP site is located in the northeastern Colorado Desert, in Riverside County, California. The Colorado Desert is part of the greater Colorado Desert Geomorphic Province. The Colorado Desert Province is characterized by isolated mountain ranges separated by broad alluvium-filled basins of Cenozoic sedimentary and volcanic materials overlying older rocks (Norris and Webb 1990). Much of the Colorado Desert lies at low elevations, in some cases, below sea level. The Colorado Desert province includes the Salton Sea, the Imperial Valley in the south and the Coachella Valley in the north (Norris and Webb 1990). The majority of the natural drainage in the vicinity of the Project site is to the east.

The Project is located in an undeveloped area and no agricultural activities are ongoing at the site; however, active agricultural areas are located to the east in the immediate vicinity. A review of the Riverside County Williamson Act Lands 2007 map indicates that the site is located in an area of the county that is not enrolled in the Williamson Act Program and the County Williamson Act map does not show lands designated as Prime, Statewide Important farmlands within the Project site. However, the United States Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS) Farmland Classification identifies approximately 20 percent of the site as either ”Prime Farmland if Irrigated,” “Prime Farmland if irrigated and reclaimed of excess salts and sodium,” or “Farmland of Statewide Importance.” The portions of the site that have been mapped are located in Sections 7 and 18 of Township 6S, Range 22E and Sections 23 and 24 of Township 6S, Range 21E. However, in order to meet the USDA-SCS definition of Prime Farmland, Farmland of Statewide Importance, or Unique Farmland, the land must have been irrigated for agricultural production at some time during the two update cycles prior to the mapping date (USDA 2009). The Project site has not been used for agricultural

production and thus would not fit the definition of Prime Farmland or Farmland of Statewide Importance. For additional discussion of agricultural resources, please see Section 5.7, Land Use.

Climate in the area of the Project site is highly variable because of the mountain ranges and desert areas. The Colorado Desert is generally sunny, dry, and warm and almost never experiences frost. Annual precipitation in the Colorado Desert ranges from three to six inches (USDA 2004). Precipitation in the City of Blythe (about eight miles east of the Project site), averages less than four inches annually (WRCC 2009). The majority of the rainfall occurs during December, January, February, and August (WRCC 2009). Winds recorded at the Blythe Airport monitoring station are prevalent from the south-southwest. They are generally light and range from four to 11 miles per hour (WRCC 2009).

5.12.2.2 Soils at the Project Site

The ground surface in the region of the Project generally slopes gently downward to the east-southeast at a gradient of less than one percent over most of the site (see Section 5.5.2.1). Steeper grades of 10 to 15 percent are present along the western side of the unnamed mound in Sections 5, 6, and 7, T06S R22E (CH2MHill 2008). A steeper grade of 50 percent was measured along the southwestern side of an unnamed knob on the northeast side of the McCoy Wash in Section 4, T06S R22E (CH2MHill 2008). Because of the high temperatures, low precipitation, and permeable soils, local drainage is intermittent and occurs as dry washes. In areas where topography is flat, soils are very sandy and there are no adjacent uplands to introduce surface runoff, discrete channels have not formed, indicating that most precipitation infiltrates immediately into the ground (CH2MHill 2008).

Soil survey maps were obtained from the NRCS website (2009); however, approximately 80 percent of the site has not been mapped. The areas of the site that have been mapped include Sections 7 and 18 of Township 6S, Range 22E and Sections 23 and 24 of Township 6S, Range 21E. The majority of the mapped areas are underlain by Chuckawalla very gravelly silt loam but also include Aco gravelly loamy sand, Aco sandy loam, Carrizo gravelly sand, Orita fine sand, Orita gravelly loamy sand, Orita gravelly fine sand loam, Rositas fine sand, and Rositas gravelly loamy sand. The electronic shape files for these mapping units were downloaded from the NRCS web site. Detailed soil descriptions were developed from the Official Series Descriptions (OSDs; NRCS, 2009a). Soil characteristics including depth, texture, drainage, permeability, and erosion hazard of individual soil mapping units are included in Table 5.12- 4. Land capability classification is an indicator of the soils primary limitations for revegetation. Soil types on the plant site include VIIe and VIIIs Capability Subclasses, which means the soils have very severe limitations that make them unsuitable for cultivation. The Project area is undeveloped and covered with native vegetation.

A historical soils map from 1922 (University of Alabama 2009) shows soil mapped across the entire site. The soil units shown on this map include (in order of abundance): Superstition sand, Tijeras stony sandy loam, Tijeras sandy loam, Carrizo sand, Superstition gravelly sand, Rough stony land, and Riverwash. No further soil descriptions were provided with the map.

Site soils were described during a reconnaissance-level geotechnical assessment conducted for the site (CH2MHill 2008). General observations indicated that the overall soil gradation trended from coarser- to finer-grained alluvial deposits with increased distance from the McCoy Mountains. The ground surface in the western portion of the site is dominated by areas of desert pavement with layers of flat-lying gravel overlying finer-grained sandy materials. East toward Black Creek road, the surface becomes less dominated by desert pavement and becomes sandier.

The CH2MHill reconnaissance described typical soil types near the western limits of the site as being expected to range from silty gravel with sand and cobbles to silty sand with gravel and cobbles, depending on the percentage of gravel present in the soils. Typical fines content in these soils would be expected to range from 15 to 35 percent and would likely consist of silt or silty clay (CH2MHill 2008).

Farther east, the gravel content typically decreases, with the exception of some of the larger washes. Typical soil types in the central portion of the Site would be expected to include silty clayey sand, silty sand, and clayey sand depending on the nature of the fines present in the soils. Typical fines content in these soils would be expected to be in the range of 30 to 50 percent and would likely consist of silt, silty clay, or clay (CH2MHill 2008).

Table 5.12- 4 Soil Mapping Unit Descriptions and Characteristics

Map Unit	Description
Ac	Aco Gravelly Loamy Sand - Formed in alluvial fan from mixed alluvium - Well drained - Slopes range from 0 -1% - Mostly low runoff, sloping areas may have moderate runoff - Moderately rapid permeability - High hazard of wind erosion - Capability Subclass VIIe - Taxonomic Class: Coarse-loamy, mixed, superactive, hyperthermic Typic Haplocalcids
Af	Aco Sandy Loam - Formed in alluvial fan from mixed alluvium - Well drained - Slopes range from 0 -1% - Mostly low runoff, sloping areas may have moderate runoff - Moderately rapid permeability - High hazard of wind erosion - Capability Subclass VIIe - Taxonomic Class: Coarse-loamy, mixed, superactive, hyperthermic Typic Haplocalcids
Ce	Carrizo Gravelly Sand - Formed in arroyos from mixed sandy and gravelly alluvium - Excessively drained - Slopes range from 0 - 2% - Negligible or very low runoff - Rapid or very rapid permeability - Very low hazard of wind erosion - Capability Subclass VIIIs - Taxonomic Class: Sandy-skeletal, mixed, hyperthermic Typic Torriorthents
Ch	Chuckawalla Very Gravelly Silt Loam - Forms fan remnants derived from mixed alluvium - Well drained - Slopes range from 0 - 1% - Moderate runoff - Moderate permeability - Very low hazard of wind erosion - Capability Subclass VIIs - Taxonomic Class: Loamy-skeletal, mixed, hyperthermic Typic Calciargids

Table 5.12- 4 Soil Mapping Unit Descriptions and Characteristics

Map Unit	Description
Oc	Orita Fine Sand - Forms fan remnants derived from mixed alluvium - Well drained - Slopes range from 0 - 1% - Low to moderate runoff - Moderate permeability - Very high hazard of wind erosion - Capability Subclass VIIs - Taxonomic Class: Fine-loamy, mixed, superactive, hyperthermic Typic Haplocalcids
Og	Orita Gravelly Loamy Sand - Forms fan remnants derived from mixed alluvium - Well drained - Slopes range from 0 - 1% - Low to moderate runoff - Moderate permeability - High hazard of wind erosion - Capability Subclass VIIs - Taxonomic Class: Fine-loamy, mixed, superactive, hyperthermic Typic Haplocalcids
Or	Orita Gravelly Fine Sandy Loam - Forms fan remnants derived from mixed alluvium - Well drained - Slopes range from 0 - 1% - Low to moderate runoff - Moderate permeability - Moderate hazard of wind erosion - Capability Subclass VIIs - Taxonomic Class: Fine-loamy, mixed, superactive, hyperthermic Typic Haplocalcids
RoA	Rositas Fine Sand, 0 to 2 Percent Slopes - Forms sand sheets derived from eolian sands - Well drained - Slopes range from 0 - 2% - Negligible to low runoff - Rapid permeability - High to very high hazard of wind erosion - Capability Subclass VIIs - Taxonomic Class: Mixed, hyperthermic Typic Torripsamments

Table 5.12- 4 Soil Mapping Unit Descriptions and Characteristics

Map Unit	Description
RsA	Rositas Gravelly Loamy Sand, 0 to 2 Percent Slopes - Forms sand sheets on stream terraces, derived from eolian sands over mixed alluvium - Somewhat excessively drained - Slopes range from 0 - 2% - Negligible to low runoff - Rapid permeability - High to very high hazard of wind erosion - Capability Subclass VIIs - Taxonomic Class: Mixed, hyperthermic Typic Torripsamments

5.12.2.3 Hazards Related to Soil Conditions

Please see Section 5.5.2.3, Geologic Hazards, for discussions concerning slope stability, subsidence, collapsible soil conditions, and expansive soils. Based on the Phase I Environmental Site Assessment (ESA) conducted for the site (AECOM 2009), contaminated soils that could be disturbed by Project construction are not present at the Project site or at properties adjacent to the site (see additional discussion in Section 5.16, Waste Management and the Phase I ESA provided in Appendix I).

5.12.3 Environmental Impacts

Environmental impacts associated with the construction and operations are discussed in the following sections. Significance criteria were developed based on California CEQA Guidelines and evaluated using professional judgment. Impacts would be considered significant if:

- Substantially increased wind or water-induced soil erosion occurred as result of Project construction or operation,
- Substantially increased sedimentation occurred in areas adjacent to construction areas,
- Prime Farmlands, Farmlands of Statewide Importance, or Unique Farmlands were lost, or
- Construction activities were to occur in areas of high erosion susceptibility and the disturbed areas were left exposed and not properly stabilized.

5.12.3.1 Construction

Grading of the Project site will result in a less than one percent slope downward from the west to the east of the site. Earthwork associated with the Project will include excavation for foundations and underground systems, and the total earth movement that will occur is approximately 8.3 million cubic yards.

The vast majority of the Project grading and excavation will occur on the Project site with only minor excavation needed for installation of gas line. Known soil types that will be affected are listed in Table 5.12-4. Off-site linear facilities associated with the site have a length of 9,790 linear feet (1.85 miles) and will affect only the Chuckwalla Loam, Carrizo Gravelly Sand, and the Aco Sandy Loam soil units. The runoff potential of these soils is negligible to moderate, the water erosion hazard is moderate, and the wind erosion hazard is moderate to high. Topographic slopes in the Project area are generally less than one percent.

During construction, the Project site and area of off-site linear facilities will be disturbed. At that time, the surface of the disturbed areas will be devoid of vegetation and there will be the highest potential for erosion, as well as associated effects including soil loss and increased sediment yields downstream from disturbed areas. With the implementation of Best Management Practices (BMPs) such as straw bales, silt fences, and limiting exposed areas, the impacts of soil erosion during construction should be less than significant. Earth movement will be balanced on-site and there will be no fill material imported or exported.

Water Erosion

The runoff designations for the soils affected during site grading are negligible to low for the Rositas fine sand and Rositas gravelly loamy sand, low to moderate for the all other soil units mapped by the NRCS. In contrast the Carrizo and Rositas soil series have rapid to very rapid permeability whereas the Aco, Chuckawalla, and Orita soil series have moderate permeability. The majority of site features are located on soil units that have not been mapped for permeability and runoff potential. Because of the climatic conditions, potential for precipitation, and storm water runoff that historically does not reach the valley from surrounding mountains, infiltration at the site is expected to be moderate to rapid. A more detailed discussion of surface water conditions at the Project site is included in Section 5.17 Water Resources.

The potential for soil loss by water erosion will be estimated using the Universal Soil Loss Equation for pre-development, during construction, and post-development conditions. Soil data has been collected and surveys have been conducted to estimate the soil loss at the site. At this time, the data are being evaluated and will be used for the Universal Soil Loss Equation to estimate soil loss by water erosion. Soil loss estimates will be provided once the calculations are complete.

Wind Erosion

The soils on the BSPP plant site have a low to high hazard for wind erosion. BMPs as described above and others included in the preliminary construction SWPPP/DESCP (see Appendix L) will minimize soil loss due to wind erosion. The formal results of the ongoing geotechnical survey will provide a detailed determination of wind erosion susceptibility.

Best Management Practices

Project construction activities will disturb site soils at the site and along the linear facilities route(s). It is at the time of this disturbance that there will be the highest potential for erosion, as well as associated effects including soil loss and increased sediment yields downstream from disturbed areas. As outlined in the preliminary construction SWPPP/DESCP (see Appendix L), BMPs will minimize the impacts of soil erosion during construction to less than significant. Construction phase BMPs will include the following:

- Local soil berms and a detention area will be constructed to contain storm water runoff.
- During site grading, clearing and grubbing will be confined to only those areas needed for facility construction as indicated in the conceptual grading plan (see Appendix L).
- Temporary erosion controls, including crushed rock, silt fences and fiber rolls, will be used as needed to minimize erosion in active grading areas. Soil stockpiles will be covered prior to forecasted storm events and during windy conditions. Fiber rolls or gravel bags will be placed around the perimeter of the stockpiles to further minimize the potential for runoff.
- Water will be used to control dust and will be applied at a rate so as to minimize runoff. Systematic watering of active grading areas during construction is expected to significantly reduce wind-borne dust. Measures to control dust are discussed in Section 5.2, Air Quality.

If erosion is observed, BMPs will be applied immediately. In the event that the BMPs implemented fail, corrective actions will be taken immediately. Temporary erosion control measures will be implemented as

needed to control erosion. Temporary sediment control materials will be available on site throughout the life of the Project to respond as needed to unforeseen rain or emergencies.

5.12.3.2 Operation

With the implementation of BMPs, and associated monitoring activities included in the operations phase SWPPP/DESCP, soil erosion would be expected to be minor during Project operations. Further, the Project will utilize soil stabilizers within the solar array area in order to reduce the amount of dust deposited on the solar collectors (dust adversely affects their efficiency). Also, the water from mirror washing and compaction of the driving surfaces over time will serve to control dust. Impacts of Project operation on several rerouted desert washes are discussed in Section 5.3, Biological Resources.

Post construction actions will include dust control through periodic watering, placement of gravel berms and detention structures to control sediment loss, and management of storm water runoff. The power block area will be graded with moderate slopes to direct runoff and divert storm water to surface swales. Diversion ditches and the detention area will be designed to accommodate flow from a 100-year storm event. The source of water (groundwater) and management of surface water for the Project are discussed in detail in 5.17 Water Resources. Roads and paved areas will be kept free of dust, dirt and visible soil materials. An entrance/outlet tire wash will be constructed and maintained.

Section 5.2, Air Quality also discusses the effects of power plant emissions on surrounding soil and vegetation systems. Based on evaluation of nitrogen oxides (NO_X), sulfur oxides (SO_2), carbon monoxide (CO) and particulate matter emission factor less than 10 (PM10), emissions from the boilers and HTF heaters will not have a significant adverse impact on vegetation and soils surrounding the Project area.

5.12.3.3 Cumulative Impacts

Cumulative projects in the area would be required to comply with water quality and air quality LORS as part of their separate project review processes. The applicable water quality and air quality management and mitigation requirements would control soil and wind erosion associated with the individual projects, as is the case with the BSPP. Also, because the Project would have no impacts on agricultural resources, it would not contribute to possible cumulative impacts on agricultural soils of the area. Project soils impacts would not be cumulatively considerable.

5.12.4 Mitigation Measures

Implementation of the mitigation measure presented below will minimize soil loss (and thus also protect water quality) from Project construction and operations phase activities.

SOIL-1: Erosion control plans will be developed and implemented to ensure minimum soil loss and to maintain water quality. Temporary and long-term erosion control measures will be constructed and maintained as necessary during and following construction until long-term stabilization has been established for the life of the Project.

Such erosion and sedimentation control measures may include but are not limited to: minimizing disturbance; wetting the roads in active construction areas, and laydown areas; controlling speed on unpaved surfaces; placing gravel in entrance ways; use of straw bales, silt fences, and earthen berms to control runoff.

SOIL-2 Conduct project construction grading in compliance with industry best practices and Riverside County grading permit requirements. A grading plan and permit application will be submitted six (6) weeks prior to the start of construction.

SOIL-3 Conduct project construction and operation activities in accordance with the construction and operations phase DESCP submitted to the CEC. SWPPPs also will be required for both construction and operations phases. These document will include BMPs (e.g., use of runoff control measures such as hay bales and silt fences, regular inspections of drainage control structures) to reduce erosion and sedimentation.

5.12.5 References

AECOM, 2009. Phase I Environmental Site Assessment of Proposed Solar Power Plant Site Located in Riverside County, Near Blythe, California. Prepared for Solar Millennium, LLC.

CH2MHill, 2008. Reconnaissance-Level Geotechnical and Water Supply Assessment for Blythe Solar Projects, Draft, October 2008.

Department of Conservation, 2007. Division of Land Resource Protection, Riverside County Williamson Act Lands 2007. Accessed at ftp://ftp.consrv.ca.gov/pub/dlrp/WA/Map%20and%20PDF/Riverside/RiversideWA_07_08.pdf

United State Department of Agriculture, Natural Resources Conservation Service, 2009. Custom Soil Resource Report for Colorado Desert Area, California, and Palo Verde, California. Accessed on May 14, 2009 at http://websoilsurvey.nrcs.usda.gov/app/HomePage.htm

United States Department of Agriculture, Forest Service, 2004. Henry McNab and Peter E. Avers, Ecological Subregions of the United States. WO-WSA-5, July 2004. Accessed on July 21, 2009 at http://www.fs.fed.us/land/pubs/ecoregions/ch40.html#322C

United State Department of Agriculture, Natural Resources Conservation Service, 2009a. Official Soil Series Descriptions. Accessed on May 15, 2009 at http://soils.usda.gov/technical/classification/osd/index.html

University of Alabama 2009. Historical Soil Survey Maps of California, Palo Verde 1922. Accessed at http://alabamamaps.ua.edu/historicalmaps/soilsurvey/california.html on May 4, 2009.

WRCC, 2009. Western Regional Climate Center, Reno, NV. Accessed at http://www.wrcc.dri.edu/index.html.