

5.5 SOIL RESOURCES

The following paragraphs describe the potential changes in erosion-related soil loss within the boundaries of the Project site under the Modified Project as compared to the Approved Project using the Revised Universal Soil Loss Equation, Version 2 (RUSLE2) model.

5.5.1 Summary of Project Changes Related to Soils

This section specifically addresses potential changes in soil loss caused by sheet and rill erosion and wind erosion. Section 5.2.2.1, Water Resources (Stormwater: Flooding, Erosion and Sedimentation) addresses the overall potential for change in erosion and sedimentation impacts under the Modified Project as compared to the Approved Project.

Section 5.2, Water Resources, describes the following elements of the Modified Project that are relevant to soil erosion:

- addition of inverter pads;
- replacement of SunCatchers with PV modules (coverage, orientation, location, spacing and size of posts);
- grading configuration and disturbance;
- number and types of access roads; and
- relocation of the main services complex and on-site substation south of the railroad.

These elements of the Modified Project, which are described in greater detail in Section 5.2.2.1, have been taken into account in the updated RUSLE2 analysis summarized below.

5.5.2 Changes in Environmental Impacts

The Commission Decision stated that the planned construction activities for the Approved Project, including excavation, grading, road construction and foundation installation, could result in soil loss and compaction, as well as loss of soil productivity. The level of impact would depend significantly on the exposure to wind and water. The Commission concluded that implementation of erosion control measures identified in the Conditions, including Best Management Practices (BMPs), development and implementation of grading plans, and implementation of a Drainage Erosion and Sedimentation Control Plan (DESCP) would be sufficient to reduce the potential erosion and sedimentation impacts to less than significant levels.

Soil loss associated with the Approved Project, both during and after construction, was evaluated during the licensing proceedings using the RUSLE2 and the Wind Erosion Prediction System. Sheet and rill erosion due to storm water runoff was estimated for existing conditions, the construction phase with no BMPs, the construction phase with BMPs, and the operational phase with BMPs on a tons per acre per year basis.

Under the Modified Project, the construction- and operation-phase activities that could potentially generate changes in soil-related impacts would be equivalent to those described in the Commission Decision. In particular, during the construction phase, under the Modified Project, limited grading (cut and fill) would be required for PV module installation, roadways, bridge construction, fencing, building foundations, inverter pad foundations, and evaporation ponds. Likewise, other items required for construction of the main services complex and various other site installation items would be similar under the Approved Project and Modified Project. Table 5.2-1, in Section 5.2, describes disturbance acreages for the Modified Project. The Modified Project grading would be equivalent to or less than that identified in the Approved Project. Additionally, PV module-related maintenance activities would be significantly reduced in frequency. Less frequent vehicle traffic for PV module maintenance would result in less ground disturbance. A SWPPP would be prepared to provide BMP measures to mitigate any potential for soil loss resulting from the Modified Project. Similarly, an operation-phase industrial SWPPP and BMPs would be prepared and implemented to ensure that no significant water quality impacts would occur during operation. Based on soil loss estimate calculations, it is expected that the construction- and operation-phase soil losses, if with implementation of the same or similar BMPs as those proposed for the Approved Project, would not significantly change under the Modified Project.

Updated soil loss calculations are provided in Appendix C. The soil loss calculations provide an estimate of the amount of expected soil loss for existing conditions, and construction and operation phases, with and without BMPs. The estimated soil loss is expressed in tons per acre per year. A broader range of site slopes and overland flow lengths are anticipated to be encountered under the Modified Project due to the increased cover of the PV modules, and decrease in the spacing of the PV module post supports. Therefore, expanded ranges of flow path lengths and slope steepness were included in the modeling for the Modified Project. The existing and proposed typical site slope lengths and overland flow lengths were based on: 1) existing and proposed site slopes, 2) slope lengths required to produce concentrated flow that would likely result in erosion for a particular slope (i.e., concentrated flow would likely begin to occur on a slope of 0.5 percent within 50 feet, or on a slope of 5 percent within 100 feet). The Approved Project estimated soil loss rates represented a conservative condition, with an overland flow path length of 150 feet and an average slope steepness of 5 percent. Additional calculations were performed for the Modified Project that included overland flow path lengths of 50 feet, a slope steepness of 0.5 percent, and a 100-foot overland

flow length with a steepness of 5 percent for construction and operation conditions, to provide a broader range of conditions that could be encountered during construction.

The results of the revised soil loss calculations indicated that the estimated soil loss rates under the Modified Project, with the implementation of construction- and operation-phase BMPs, are in some cases less than but not significantly different from those expected under the Approved Project. The BMPs, to be specifically identified in the DESCOP, construction SWPPP, and industrial SWPPP, would be effective at reducing potential soil loss during construction to existing condition levels. Similarly, soil loss due to wind erosion is not expected to significantly change with implementation of wind erosion control BMPs. The Project Owner does not plan to apply soil stabilizer or soil weighting agents on unimproved module access points because of their infrequent use. However, significant soil loss is not expected to occur in the absence of soil stabilizers or soil weighting agents between the PV modules because these areas would only be accessed approximately four times per year for PV module washing and occasional maintenance. This level of infrequent and time-distributed access is not anticipated to create significant increases in soil loss within the PV module arrays. Results of soil loss calculations are presented in Table 5.5-1 below.

**TABLE 5.5-1
ESTIMATED SOIL LOSS RATES UNDER APPROVED AND MODIFIED PROJECT CONDITIONS**

Soil Type	Existing (ton/ac/yr)	Construction – Cut Area with No BMPs (ton/ac/yr)	Construction – Fill area with No BMPs (ton/ac/yr)	Construction – Average with No BMPs (ton/ac/yr)	Construction with BMPs (ton/ac/yr)	Operations with BMPs (ton/ac/yr)
Approved Project Estimates						
Carrizo Rositas Gunsight (60% Gravel, 30% Sand, 10% fines)	0.53	0.53	1.4	0.97	0.33	0.23
Nickel-Arizo-Bitter (30% Gravel, 30% Sand, 40% fines)	2.1	2.1	5.7	3.1	0.052	0.052
Modified Project Estimates						
Carrizo Rositas Gunsight (60% Gravel, 30% Sand,	0.53	0.06-0.53	0.13-1.4	0.97	0.0018-0.33	0.0018-0.23

10% fines)						
Nickel-Arizo-Bitter (30% Gravel, 30% Sand, 40% fines)	2.1	0.24-2.1	0.56-5.7	3.1	0.014-0.052	0.014-0.052

Acronyms/Abbreviations/Notes:

BMP = Best Management Practice (silt fence, fiber roll, or other linear sediment control feature)
 < = less than

% = percent
 ton/ac/yr = tons per acre per year
 Soil loss rates reflect sheet flow and rill erosion caused by storm water runoff and were calculated using the RUSLE2 computer program.

5.5.3 Changes in Cumulative Effects

Incremental impacts of the Modified Project on soils are expected to be the same or slightly reduced compared to the Approved Project. As described in Section 1.4.1, Cumulative Scenario, no new reasonably foreseeable future actions beyond those assumed in the Commission Decision have been identified. Therefore, no increase in cumulative impacts under the Modified Project is anticipated.

5.5.4 Changes in LORS Conformance and Other Permits

In the Commission Decision, the Commission concluded that, with the implementation of the Conditions, the Approved Project would comply with all applicable LORS. As with the Approved Project, the Modified Project would comply with all applicable LORS, and no new or additional LORS have been identified.

The Commission Decision stated that the following permits relating to soils would be required prior to construction:

- a grading permit from the County of San Bernardino Land Use Services Department, Building & Safety Division;
- a Notice of Intent and National Pollutant Discharge Elimination System (NPDES) General Construction Storm Water Permit (Construction SWPPP); and
- a Notice of Intent and NPDES General Industrial Storm Water Permit (Industrial SWPPP).

The permits would be obtained prior to pre-construction site mobilization. The Modified Project would not be anticipated to necessitate any permits beyond those identified in the Commission Decision. In addition to the above permits, site-specific hydrologic/hydraulic/scour analyses and a DESCOP would be prepared for submittal to San Bernardino County, BNSF and the Compliance Project Manager (CPM).

5.5.5 Changes in Proposed Mitigation

No new or more severe impacts requiring additional mitigation would result from the Modified Project. The mitigation measures proposed in the Commission Decision would mitigate impacts associated with the Modified Project to levels that would be less than significant.

5.5.6 Changes in Conditions of Certification

The Commission Decision listed Conditions **SOIL&WATER-1** and **SOIL&WATER-10**, which are directly applicable to soils. No modification to these Conditions of Certification or additional conditions would be necessary to mitigate soil-related impacts from the Modified Project.