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5.4 SOILS

This section describes the affected environment and the environmental effects of the Pio Pico Energy Center (PPEC) on agriculture and soils in accordance with California Energy Commission (CEC) requirements. Impacts are assessed for the construction and operations of the proposed new generating plant structures. As appropriate, agriculture and soils-related mitigation measures and conditions of certification are also included in this section. With implementation of proposed mitigation measures and conditions of certification, as outlined in this section, the project will have no significant environmental impacts and will comply with all applicable laws, ordinances, regulations, and standards (LORS).

5.4.1 Affected Environment

5.4.1.1 Project Site, Linears, and Temporary Laydown Area

PPEC consists of the project site, linears, and a temporary laydown area (Figure 3.3-1, Facility Plot Plan and Figure 3.3-3, Potential Linears). The project site is located in an unincorporated area of San Diego County known as Otay Mesa. It is comprised of a 9.99-acre parcel located in the southeast quadrant of the Alta Road and Calzada de la Fuente intersection. The proposed project site comprises the entire parcel with Assessor's Parcel Number (APN) 648-040-45, and the laydown area is 6.00 acres of an adjacent parcel to the south (APN 648-040-46) (Figure 3.3-2, Project Location). The existing setting within one mile of the project site and potential transmission line routes are presented on Figure 3.3-4. The project affects the following areas:

- Plant site – 9.99 acres.
- Temporary laydown and parking area – 6.00 acres, on an adjacent parcel that is contiguous to the project site.
- Natural Gas pipeline – There are two possible routes for the gas supply pipeline. Both routes would connect to an existing SDG&E natural gas pipeline, but at different locations. Route A would extend approximately 8,000 feet south along Alta Road to near the U.S.–Mexico border, at which point it would connect to the existing SDG&E natural gas pipeline. Route B would extend approximately 2,375 feet south along Alta Road, turn west on Otay Mesa Road, and continue approximately 7,920 feet to Harvest Road at which point it would connect to the existing SDG&E natural gas pipeline (Figure 3.3-3, Potential Linears) for a total of approximately 10,300 feet. The pipeline will be constructed, owned, and operated by SDG&E.
- Sewer pipeline – A short connection will be made to an existing 12-inch sewer main along Calzada de la Fuente along the north project site boundary or to an existing 15-inch sewer main along Alta Road, along the west project site boundary.
- Stormwater pipeline – A short connection will be made from a detention pond located at the northwest corner of the project site to an existing 30-inch stormwater pipeline located along Calzada de la Fuente, adjacent to the project site.

- Power line – Two possible routes are provided for a 230-kV transmission line that will connect the project into the existing 230-kV Otay Mesa switchyard. Route A would begin as an overhead power line along Calzada de la Fuente, extend approximately 1,700 feet east where it would then be routed underground for approximately 400 feet into the Otay Mesa switchyard (total length of Route A would be approximately 2,100 feet). Route B would begin as an overhead power line from the eastern edge of the project site, run south approximately 550 feet, then turn east along the northern border of the parcels with APN 648-040-48 and APN 648-040-43 for 1,400 feet, and finally turn north for approximately 700 feet into the Otay Mesa switchyard (total length of Route B would be approximately 2,650 feet). The power line will be owned and maintained by the Applicant.

- Water supply pipelines – The project will make a short connection to the potable service system, either at an existing 12-inch main along Calzada de la Fuente, or at an existing 24-inch main along Alta Road. Upon the Otay Water District (OWD)'s completion of the planned Otay Mesa area recycled water system, the project will make a connection to the existing 8-inch recycled water main along Calzada de la Fuente or to a new recycled water main to be constructed in Alta Road.

These features are illustrated on Figure 3.3-1, Facility Plot Plan and Figure 3.3-3, Potential Linears.

5.4.1.2 Soil Resources

Soils are mapped and described as "soil series." The locations and properties of the soil series were identified from data and maps prepared by the United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Web Soil Survey (WSS) (USDA, 2010). A list of soil types encountered in the area surrounding PPEC is included in Table 5.4-1, and a map of soil types is provided as Figure 5.4-1. The WSS Database contains official USDA soil survey information as viewable maps and tables for more than 2,300 soil surveys in the United States and its territories. The soil descriptions provided below are summarized from the WSS Database. Refer to Section 5.3 (Geological Hazards and Resources) for the additional description of the subsurface soils and rocks.

The site topography as of December 2010 is provided on Figure 3.4-1, 2010 Site Topography. The industrial park developer will grade the property in first quarter 2011 as described in the 2009-2010 County of San Diego Grading permit 2700-1555. This planned soil removal and grading of the property was already planned for prior to the inception of this project and will occur regardless of the submittal of this AFC or its eventual approval. Site elevation for purposes of this project will be approximately 635 feet above mean sea level (msl). This will establish the baseline conditions that this AFC is founded upon. The baseline site topography is shown on Figure 3.4-2, Baseline Site Topography.

Figure 3.4-2, Baseline Site Topography, shows the PPEC site's topography as anticipated after the industrial park developer completes the grading plan. Elevation at the project site will be approximately 635 feet above mean sea level (msl) once the grading is completed. Grading is expected to be completed in first quarter 2011, under the 2009-2010 County of San Diego

Grading Permit 2700-1555. The soils identified and discussed below represent the soil conditions in the planned construction areas. The native soils present in the study area surrounding the PPEC site consist of the units included in Table 5.4-1 (refer to Figure 5.4-1).

TABLE 5.4-1
SOIL TYPES IN THE STUDY AREA
(IN PROXIMITY TO PPEC)[1]

Map Unit Symbol	Map Unit Name
DaC	Diablo Clay, 2 to 9 percent slopes
DaD	Diablo Clay, 9 to 15 percent slopes
DaE2	Diablo Clay, 15 to 30 percent slopes, eroded
HrD	Huerhuero Loam, 9 to 15 percent slopes
HrE2	Huerhuero Loam, 15 to 30 percent slopes, eroded
OhF	Olivehain Cobbly Loam, 30 to 50 percent slopes
ScA	Salinas Clay, 0 to 2 percent slopes
SnG	San Miguel-Exchequer Rocky Silt Loams, 9 to 70 percent Slopes
SuA	Stockpen Gravelly Clay Loam, 0 to 2 percent slopes
SuB	Stockpen Gravelly Clay Loam, 2 to 5 percent slopes
TeF	Terrace Escarpments
VbB	Visalia Gravelly Sandy Loam, 2 to 5 percent slopes

[1] Table summarizes soil types within 2 miles of plant; refer to Figure 5.4-1.

The area to be affected by the planned construction (Figure 5.4-1) is underlain by the following soil types:

- Diablo clay, 2 to 9 percent slopes; DaC
- Diablo clay, 9 to 15 percent slopes; DaD
- Huerhuero loam, 9 to 15 percent slopes; HrD; and
- Salinas clay, 0 to 2 percent slopes; ScA.

For purposes of discussion, the Diablo clay soils are considered together because the only difference between them is the slope upon which they are encountered. The soils have the following properties:

Diablo Clay (DaC and DaD)

The Diablo clay underlies all of the power plant and laydown areas and significant portions of the proposed pipeline and transmission line corridors (Figure 5.4-1). However, site preparation prior to the project will remove or cover most of the Diablo clay on the power plant site. Accordingly, most of the plant site and a portion of the laydown area will be underlain not by the surficial soils described in this section but by components of the Otay formation, noticeably rockier and less prone to erosion by water or wind than the Diablo clay.

The Diablo clay forms on hillslopes and consists of about 85 percent Diablo and similar soils and about 15 percent minor components. It forms from calcareous sandstone and shale parent materials and is considered well drained with a moderately low to moderately high capacity to transmit water. Its land capability classification is 3e (both irrigated and non-irrigated), and it

has no capacity to pond or flood with a moderate available water capacity and a maximum calcium carbonate content of about ten percent. It has an erosion hazard value of 0.50.

Huerhuero Loam, 9 to 15 Percent Slopes

The Huerhuero loam consists of about 85 percent Huerhuero and similar soils and about 15 percent minor components. It forms on marine terraces from calcareous alluvium derived from sedimentary rock. It is considered moderately well drained with the capacity of the most limiting layer to transmit water of very low to moderately low. The Huerhuero loam is considered nonsaline with no capacity to flood or pond and a moderate available water capacity. Its land capability classification, for both the irrigated and the non-irrigated condition, is 4e. The typical profile consists of an upper 12 inches of loam followed by clay loam and clay to a depth of about 55 inches over stratified sand to sandy loam to about 72 inches. It has an erosion hazard value of 0.95.

Salinas Clay, 0 to 2 Percent Slopes

The Salinas clay consists of about 85 percent Salinas as well as similar soils and about 15 percent minor components formed on alluvial fans from mixed-source alluvium. It is well drained with a moderately high capacity of the most limiting layer to transmit water. It has no capacity to pond or flood, is nonsaline, a maximum calcium carbonate content of ten percent, and very high available water capacity. Its land capability classification is 2s for irrigated land and 3s for non-irrigated land. The typical profile is up to 22 inches of clay over 24 inches of clay loam and/or clay, and another 18 inches of loam and clay loam. It has a slight erosion hazard potential.

Agricultural Soils

No existing agricultural uses are present in the project site area, linear routes, laydown area, and surrounding areas. Additionally, the project area and surrounding areas are not designated with agricultural zoning and land use designations, and no planned or permitted agricultural uses have been identified in the project vicinity. As a result, the project would not result in direct, indirect, or cumulative impacts on agricultural land uses. Refer to Section 5.9.1.2 for more information on the assessment of agricultural resources.

5.4.2 Environmental Impacts

PPEC will be designed and constructed to meet 2007 CBC industrial facility standards and will adhere to LORS related to soils such as those pertaining to grading. Based on these actions and with implementation of appropriate mitigation measures and conditions of certification, the project is expected to have a less than significant impact on soils.

5.4.2.1 <u>Construction Related Impacts</u>

Significance criteria have been selected based on CEQA Guidelines, as well as performance standards adopted by responsible agencies. Under CEQA guidelines, an impact may be

considered significant from a soil standpoint if the project results in substantial soil erosion or loss of topsoil. Impacts to agriculture are discussed in Section 5.9, Land Use.

Construction impacts on soil resources can include increased soil erosion and soil compaction. Soil erosion causes the loss of topsoil and can increase the sediment load in the surface receiving waters downstream of the construction site. The magnitude, extent, and durations of this construction-related impact depends on the erodibility of the soil (slight, as discussed above), the proximity of the construction activity to a receiving water, the degree of contamination of the excavated soil stockpiles, and the construction methodologies, duration, and the season.

Power Plant Site

Project construction activities (including site preparation) at the PPEC site are estimated to be conducted during a 16-month period.

Figure 3.4-2, Baseline Site Topography, shows the PPEC site's topography as anticipated after the industrial park developer completes the grading plan. Excavation work will consist of the removal, storage, and/or disposal of sand, gravel, vegetation, organic matter, loose rock, and debris to the lines and grades necessary for construction. Material suitable for backfill will be stored in stockpiles at designated locations using proper erosion protection methods. Grading will be as shown in the Preliminary Grading and Drainage Plan (see Figure 3.4-3). During the construction phase of the project, erosion and sediment control measures, such as mulching, jute netting, culverts, sediment detention basins, etc., will be temporarily installed as required by local regulations.

Short-term increases in soil erosion may occur during the construction phase. The erosion hazard for soil loss due to soil erosion by sheet or rill erosion ranges from slight to moderate for most of the area to be disturbed (typically Diablo clay). However, most of the area will expose either rockier portions of the Otay formation (in cuts) or fill derived from these same materials. Project-related soil erosion will be minimized through implementation of erosion control measures described in Sections 3.5 (Civil/Structural Features) and 5.4.4. Therefore, impacts from soil erosion are expected to be less than significant.

Construction of PPEC will result in soil compaction due to mechanical compaction of backfill and the erection of foundations and paving. Soil compaction will also result from vehicle traffic along temporary access roads and in equipment staging areas. Compaction makes the soil denser, reducing pore space and impeding water and gas movement through this medium. This can result in increased runoff, erosion, and sedimentation. The incorporation of erosion control measures described in Sections 3.6 (Civil/Features) and 5.4.4 during project construction will result in less than significant impacts from soil compaction.

Site preparation and construction of the project may potentially involve excavation of contaminated soils. Contaminated excavated soils are not anticipated, but if encountered, will be stored temporarily on site and removed for disposal or treatment and recycling. Management of contaminated excavated materials will be conducted in accordance with applicable federal, state, and local regulations, as described in Section 5.14 (Waste Management). Therefore, the impact to the potential receiving waters will be less than significant.

Following construction, wind and water erosion on developed portions of the site will be reduced because the plant site will be compacted, covered with asphalt, concrete, and/or gravel, and drainage will be controlled through a storm drainage system. Implementation of mitigation measures and conditions of certification discussed in Section 5.4.4 are expected to limit impacts to the soils at the project site to a less than significant level.

Transmission Lines

Pole structures will be required for the alternate 230-kV lines located to the north or south of the existing OMGP (Figure 3.3-1). The northern route (Route A) also includes a buried transmission line section of approximately 400 feet long. Given the relatively short distance to connect to the existing Otay Mesa switchyard and the limited amount of soil disturbance that would be associated with the transmission line towers and footings, the impacts on native soils are expected to be less than significant.

Offsite Pipelines

The project includes two alternate routes (Routes A and B) for a natural gas supply pipeline (Figure 3.3-1). The excavated soil will used for backfilling after the pipe is installed in the trench. Compaction of the backfill will limit potential accelerated soil erosion of the disturbed soils and impacts will be less than significant.

Temporary Laydown Area

The temporary laydown is not currently paved, nor will it be paved during or after PPEC construction. Prior to being used by the project as a laydown area, gravel may be placed. Erosion control measures (more fully described in Sections 5.4.4.1 and 5.4.4.2) will be implemented during use to protect property from erosion damage and prevent accelerated soil erosion or dust generation. Impacts to soils are expected to be less than significant.

5.4.2.2 Potential for Soil Loss and Erosion-Water

The PPEC site and the laydown area were recently investigated for the current landowner (GEOCON Incorporated, 2010). The consultant was familiar with the area, having performed testing and observation services during the construction of roadway embankments for Alta Road, Lone Star Road, and Calzada de la Fuente. The approximately 20-acre site was investigated by excavating 12 test trenches to depths ranging between 7.5 and 13 feet below existing grade and obtaining bulk samples for laboratory testing. Of the 12 test trenches excavated, 6 were at the plant site, 3 were in the laydown area, and 3 were offsite (south of the laydown area but north of Lone Star Road). The investigation identified a thin unit of undocumented fill locally, overlying the Otay Formation. The undocumented fill will be removed by the planned grading activities as well as substantial thicknesses of the underlying Otay Formation typically described as sandstone with thin units of conglomerate and claystone locally. The report provides recommendations for site development and states that the property could be developed as planned (industrial park with associated infrastructure) provided the recommendations in the report are followed.

As described in the Geotechnical Report prepared for OMGP (Bechtel Power, 1999), nine test borings were drilled by Bechtel in 1997. Of these, B-107 and B-108 were approximately 1,300 feet east of the PPEC property line and B-109 was about 750 feet from it. Review of these

logs of borings indicates that at the approximate depth of the deepest planned excavation the materials encountered were very dense to hard sandy silt and silty sand with light cementations and very high blow counts (typically greater than 80 for 12 inches). Thus, the materials present for this project's baseline should be extremely resistant to erosion by water and/or wind. This is reflected in the soil loss calculations (Tables 5.4-2, 5.4-3, and 5.4-4).

TABLE 5.4-2
SUMMARY OF EROSION CALCULATIONS

Feature	Area (acres)	Activity	Estimates Using Universal Soil Loss Equation[1] Soil Loss with BMPs due to Water (tons/year)	Estimates Using WEPS[2] Soil Loss with BMPs due to Wind (tons/year)
Project Site	9.99	No Project	1.478	3.000
		Construction	0.887	1.800
		Operation	0.117	0.300
Laydown Area	6.00	No Project	1.282	1.800
		Construction	0.769	1.080
		Operation	1.025	1.440
Gas Line				
Route A	9.18	No Project	0.064	2.754
		Construction	0.020	1.652
		Operation	0.020	0.275
Route B	11.82	No Project	0.083	3.546
		Construction	0.026	2.128
		Operation	0.026	0.355
Power Line				
Route A	3.86	No Project	0.027	1.158
		Construction	0.085	0.695
		Operation	0.008	0.116
Route B	4.87	No Project	0.034	1.461
		Construction	0.011	0.877
		Operation	0.011	0.146

Notes:
1. Soil losses (tons/acre/year) are estimated using RUSLE2 software available online [http://fargo.nserl.purdue.edu/ rusle2_dataweb/].
- The soil characteristics were estimated using RUSLE2 soil profiles corresponding to the mapped NRCS soil unit based on the assumptions described in Table 5.4-3.
- Estimates of actual soil losses use the RUSLE2 soil loss times the duration and the affected area. The No Project Alternative estimate does not have a specific duration so loss is given as tons/year.
2. Soil losses (tons/acre/year) are estimated using WEPS software available online [http://www.weru.ksu.edu/nrcs/ wepsnrcs.html].
3. For Gas Line, refer to Figure 3.3-3, 50-foot width assumed.
4. For Power Line, refer to Figure 3.3-3, 80-foot width assumed.
5 Trenches for the natural gas pipeline are assumed to be 4 feet wide. The transmission line pole holes will each have a 4-foot by 4-foot excavation footprint.

TABLE 5.4-3
ASSUMPTIONS FOR SOIL EROSION CALCULATIONS

Location	Scenario	Area[1]	Additional RUSLE2 Assumptions	Additional WEPS Assumptions
Project Area				
	No Project	100%	100% Rock Cover	Rock Frag = 0.5
	During Construction	60%	100% Rock Cover	Rock Frag = 0.5
	Operation	10%	100% Rock Cover	Rock Frag = 0.5
Laydown Area				
	No Project	100%	100% Rock Cover	Rock Frag = 0.5
	During Construction	60%	100% Rock Cover	Rock Frag = 0.5
	Operation	80%	100% Rock Cover	Rock Frag = 0.5
Gas Line				
	No Project	100%	-	-
	During Construction	60%	-	-
	Operation	10%	-	-
Power Line				
	No Project	100%	-	-
	During Construction	60%	-	-
	Operation	10%	-	-

1 Percent represents exposure of subgrade to erosion.

TABLE 5.4-4
WATER AND WIND EROSION CALCULATIONS

Case 1: No Project Scenario
Water Erosion (RUSTLE2)

Location: Plant Area			Total Area: 10 Acres	
	% Area[2]	Acres	Soil Erosion (t/ac/yr)	Erosion (t/yr)
Section 1[1]	10%	1	0.870	0.870
Section II	80%	8	0.031	0.248
Section III	10%	1	0.360	0.360
Total Erosion for Plant Area				1.478 tons/year

Location: Laydown Area			Total Area: 6 Acres	
	% Area	Acres	Soil Erosion (t/ac/yr)	Erosion (t/yr)
Section 1[1]	10%	0.6	0.870	0.522
Section II	60%	3.6	0.031	0.112
Section III	30%	1.8	0.360	0.648
Total Erosion for Laydown Area				1.2816 tons/year

Location: Gas Line			
	Acres	Soil Erosion (t/ac/yr)	Erosion (t/yr)
Route A	9.18	0.007	0.064
Route B	11.82	0.007	0.083

Case 2: During Construction
Water Erosion (RUSTLE2)

Location: Project Area			Total Area: 6 Acres	
	% Area	Acres	Soil Erosion (t/ac/yr)	Erosion (t/yr)
Section 1[1]	10%	0.6	0.870	0.522
Section II	80%	4.8	0.031	0.149
Section III	10%	0.6	0.360	0.216
Total Erosion for Project Area				0.8868 tons/year

Location: Laydown Area			Total Area: 3.6 Acres	
	% Area	Acres	Soil Erosion (t/ac/yr)	Erosion (t/yr)
Section 1[1]	10%	0.4	0.870	0.313
Section II	60%	2.2	0.031	0.067
Section III	30%	1.1	0.360	0.389
Total Erosion for Laydown Area				0.76896 tons/year

Location: Gas Line			
	Acres	Soil Erosion (t/ac/yr)	Erosion (t/yr)
Route A	9.18	0.002	0.020
Route B	11.82	0.002	0.026

Case 3: During Operation
Water Erosion (RUSTLE2)

Location: Project Area			Total Area: 1 Acre	
	% Area	Acres	Soil Erosion (t/ac/yr)	Erosion (t/yr)
Section 1[1]	10%	0.100	0.870	0.087
Section II	40%	0.400	0.031	0.012
Section III	5%	0.050	0.360	0.018
Total Erosion for Project Area				0.1174 tons/year

Location: Laydown Area			Total Area: 4.8 Acres	
	% Area	Acres	Soil Erosion (t/ac/yr)	Erosion (t/yr)
Section 1[1]	10%	0.480	0.870	0.418
Section II	60%	2.880	0.031	0.089
Section III	30%	1.440	0.360	0.518
Total Erosion for Laydown Area				1.02528 tons/year

Location: Gas Line			
	Acres	Soil Erosion (t/ac/yr)	Erosion (t/yr)
Route A	9.18	0.002	0.020
Route B	11.82	0.002	0.026

TABLE 5.4-4
WATER AND WIND EROSION CALCULATIONS
(CONTINUED)

Location: Power Line			
	Acres	Soil Erosion (t/ac/yr)	Erosion (t/yr)
Route A	3.86	0.007	0.027
Route B	4.870	0.007	0.034

Location: Power Line			
	Acres	Soil Erosion (t/ac/yr)	Erosion (t/yr)
Route A	3.86	0.022	0.085
Route B	4.870	0.002	0.011

Location: Power Line			
	Acres	Soil Erosion (t/ac/yr)	Erosion (t/yr)
Route A	3.86	0.002	0.008
Route B	4.870	0.002	0.011

Wind Erosion (WEPS)		Area: 100%	
	Tons/ Acre	Acre	Total (t/yr)
Project Area	0.300	10.000	3.000
Laydown Area	0.300	6.000	1.800
Gas Line			
Route A	0.300	9.18	2.754
Route B	0.300	11.820	3.546
Power Line			
Route A	0.300	3.86	1.158
Route B	0.300	4.870	1.461

Wind Erosion (WEPS)		Area: 60%	
	Tons/ Acre	Acre	Total (t/yr)
Project Area	0.300	6.000	1.800
Laydown Area	0.300	3.600	1.080
Gas Line			
Route A	0.300	5.508	1.652
Route B	0.300	7.092	2.128
Power Line			
Route A	0.300	2,316	0.695
Route B	0.300	2.922	0.877

Wind Erosion (WEPS)		Area: 10%	
	Tons/ Acre	Acre	Total (t/yr)
Project Area	0.300	1.000	0.300
Laydown Area	0.300	4.800	1.440
Gas Line			
Route A	0.300	0.918	0.275
Route B	0.300	1.182	0.355
Power Line			
Route A	0.300	0.386	0.116
Route B	0.300	0.487	0.146

Notes:
1 Sections refer to the following: Section I (Cut pad); Section II (Fill area).
2 Percent represents exposure of subgrade to erosion.

Soil losses due to water-induced erosion have been calculated for the no-project alternative as well as for the construction period and the operational period as shown in Table 5.4-2 in accordance with the Revised Universal Soil Loss Equation (RUSLE 2) Model. The no-project alternative assumes that the present topography will be graded by the current landowner to the configuration shown on Figure 3.4-2. Thus, the conditions exposed at that time will be substantially different from those shown today. Furthermore, because the physical and engineering properties of the materials that will be exposed by the preliminary grading are unknown, it was assumed that rockier materials, less susceptible to erosion, would be at the new ground surface (Tables 5.4-2, 5.4-3, and 5.4-4). The results of calculations following RUSLE 2 for erosion caused by water are shown in Table 5.4-2.

5.4.2.3 Potential for Soil Loss and Erosion-Wind

Similarly, calculations for wind-induced erosion for the various site cases were developed in accordance with procedures specified in the Wind Erosion Prediction System (WEPS) model. The results of these calculations are also shown in Table 5.4-2.

5.4.2.4 Effects of Emissions on Soil-Vegetation Systems

There is a potential for emissions from a generating facility, principally oxides of nitrogen from the combustors or drift from cooling towers, to have an adverse effect on soil-vegetation systems in the project vicinity. This is principally a concern when environments that are highly sensitive to nutrients or salts, such as serpentine layers (soils and bedrock that are acidic, dry, erodible, and nutrient-poor) are downwind from the facilities. No known occurrences of ultramafic (serpentinite) bedrock have been identified in the Project area. As such, there are no concerns related to naturally occurring asbestos or serpentine layers (Tan and Kennedy, 2002).

State-of-the-art air emissions control and monitoring equipment will be installed to reduce, control, and measure air emissions (e.g., NO_X). The proposed PPEC project will include a selective catalytic reduction (SCR) system to control nitrogen oxide (NO_x) air emissions and a carbon monoxide (CO) catalyst to control carbon monoxide air emissions. Additionally, a Continuous Emissions Monitoring System (CEMS) will be installed to monitor the emissions as required by LORS. Cooling towers will be equipped with high-efficiency mist eliminators to reduce particulate matter emissions. Given the use of air emission control technology equipment, and the absence of ultramafic bedrock and associated soils in the Project area, the potential effects of emissions on soil vegetation systems is considered to be less than significant.

5.4.3 Cumulative Impacts

The purpose of this section is to identify past, present, and reasonably foreseeable actions in the PPEC project area that could affect the same resources as those of the project and provide the following analysis:

- Determine if the impacts of PPEC and the other actions would overlap in time or geographic extent.
- Determine if the impacts of the proposed project would interact with, or intensify, the impacts of the other actions.

- Identify any potentially significant cumulative impacts.

Section 5.18 presents a list of potential projects that could result in cumulative impacts with the proposed project. Soil erosion and sedimentation impacts associated with PPEC will not be significant; thus, cumulative impacts will be negligible. As discussed in Section 5.4.2.4, the project area is not located within an area of known occurrences of ultramafic bedrock. Additionally, the PPEC would implement state-of-the-art air emissions control and monitoring equipment that would reduce air emissions (i.e., NO_x). As a result, the project's incremental contribution to cumulative effects on soil-vegetation systems would be considered less than significant.

In addition, the location is not expected to have an effect on revegetation potential. The project will be constructed on disturbed land. The temporary laydown area will be restored to pre-project status or better once construction is complete.

5.4.4 Mitigation Measures and Conditions of Certification

Anticipated impacts to the surrounding area from the construction of PPEC will be minimized by the implementation of erosion control plans and storm water pollution prevention plans. Mitigation measures and conditions of certification are contained in Section 5.5, Water Resources, which ensure environmental consequences are less than significant.

In addition to the mitigation measures and conditions of certification contained in Section 5.5, Water Resources, the following erosion control measures are proposed:

5.4.4.1 Temporary Erosion Control Measures

A preliminary draft of a Drainage, Erosion, and Sediment Control Plan (DESCP) has been prepared for this project by PPEC (PPEC, 2011). Details concerning temporary and permanent erosion control measures are presented in the DESCP.

Typically, temporary erosion control measures include revegetation, slope stabilizers, dust suppression, construction of berms and ditches, and sediment barriers. Vegetation is the most desirable form of erosion control because it stabilizes the soil and maintains the landscape, and implementation of vegetation is feasible due to the quality of soil and the rural environment.

During construction of PPEC, employment of control measures will minimize the wind-blown erosion of soil from the site. Spraying clean water on the soil in construction areas will help to suppress dust.

A SWPPP will be prepared prior to construction of PPEC. This plan will be used at PPEC to control stormwater during the facility's construction. The plan will use BMPs such as stabilized construction entrances, silt fencing, berms, hay bales, and detention basins to control runoff from all construction areas. Sediment barriers such as straw bales or silt fences slow runoff and trap sediment. Generally, placement of barriers will occur at the base of exposed slopes below disturbed areas. Placing barriers around the proposed project and the property boundary serves

as prevention against sediment leaving the site. Soil stockpiles generated during construction will be covered and protected from rainfall if left onsite for extended periods of time.

5.4.4.2 Permanent Erosion Control Measures

The PPEC site will consist of paved roads, paved parking areas, and graveled areas. Stormwater that does not infiltrate the site will be routed through culverts and swales to an onsite detention basin. The grading and drainage facilities will be designed pursuant to County of San Diego requirements. BMPs will be implemented to reduce erosion and prevent silt from being discharged offsite. The site grading and drainage plan for the project includes a detention basin for on-site stormwater (refer to Figure 3.4-3, Preliminary Grading and Drainage Plan).

5.4.5 Laws, Ordinances, Regulations and Standards

The following laws, ordinances, regulations, and standards (LORS) are applicable to protection of soils resource and protection of surface water quality from project-induced erosion impacts. Table 5.4-5 provides a summary of these applicable LORS. The proposed project will be constructed and operated in accordance with applicable LORS and permit conditions.

TABLE 5.4-5
LORS APPLICABLE TO SOILS RESOURCES

LORS	Applicability	Conformance
Federal		
The Federal Water Pollution Control Act of 1972; Clean Water Act of 1977	Establishes requirements for any facility or activity that has or will discharge waste (including sediment due to accelerated erosion) that may interfere with the beneficial uses of receiving waters	Sections 5.4.2, 5.4.5.4
U.S. Department of Agriculture, Soil Conservation Service (SCS). *National Engineering Handbook (1983)*, Sections 2 and 3	Planning, design, and construction of soil conservation practices	Sections 5.4.2, 5.4.5.4
State		
Cal. Public Resources Code § 25523(a): CCR §§ 1752, 1752.5, 2300-2309, and Chapter 2, Subchapter 5, Article 1, Appendix B, Part (i)	Protection of Environmental Quality	Sections 5.4.2, 5.4.5.4
California Environmental Quality Act, Cal. Public Resources Code § 21000 *et seq*.; Guidelines for Implementation of the California Environmental Quality Act of 1970, 14 CCR §§ 15000-15387, Appendix G	Substantial soil erosion or loss of topsoil, degradation or loss of available agricultural land, agricultural activities, or agricultural land productivity in the project area, alteration of agricultural land characteristics due to plant air emissions, or conversion of prime or unique farmland, or farmland of statewide importance, to no-agricultural use	Sections 5.4.2, 5.4.5.4
The California Porter-Cologne Water Quality Control Act of 1952; Cal. Water Code, §§ 13260 – 13269; 23 CCR Chapter 9	Requires adequate protection of water quality by appropriate design, sizing, and construction of erosion and sediment controls	Sections 5.4.2, 5.4.5.4
Local		

LORS	Applicability	Conformance
County of San Diego, Department of Public Works	Establishes grading and excavation requirements during the construction phase of the project	Sections 5.4.2, 5.4.5.4

5.4.5.1 Federal

The Federal Water Pollution Control Act of 1972; Clean Water Act of 1977 (including its 1987 amendments). These authorities establish requirements for any facility or activity that has or will discharge waste (including sediment due to accelerated erosion) that may interfere with the beneficial uses of receiving waters.

Administering Agency. The administering agency for the above authority is the U.S EPA, California State Water Resources Control Board, San Diego Regional Water Quality Control Board (SDWQCB).

U.S. Department of Agriculture (USDA), Soil Conservation Service (SCS). *National Engineering Handbook (1983)*, Sections 2 and 3. The USDA prescribes standards of technical excellence for the SCS, now called the Natural Resources Conservation Service (NRCS) for the planning, design, and construction of soil conservation practices.

Administering Agency. The administering agency for the above authority is the NRCS.

5.4.5.2 State

Cal. Public Resources Code § 25523(a): CCR §§ 1752, 1752.5, 2300-2309, and Chapter 2, Subchapter 5, Article 1, Appendix B, Part (i). The Act provides for protection of environmental quality. With respect to PPEC, the Act requires submittal of information to the CEC concerning potential environmental impacts, and the CEC's decision on the Application for Certification (AFC) must include consideration of environmental protection.

Administering Agency. The administering agency for the above authority is the CEC.

Environmental Quality Act, Cal. Public Resources Code § 21000 *et seq.*; Guidelines for Implementation of the California Environmental Quality Act of 1970, 14 CCR §§ 15000-15387, Appendix G. The CEQA guidelines specify that an impact may be considered significant from an agriculture and soil standpoint if the project results in: substantial soil erosion or loss of topsoil, degradation or loss of available agricultural land, agricultural activities, or agricultural land productivity in the project area, alteration of agricultural land characteristics due to plant air emissions, or conversion of prime or unique farmland, or farmland of statewide importance, to no-agricultural use.

Administering Agency. The administering agency for the above authority is the CEC.

The California Porter-Cologne Water Quality Control Act of 1952; Cal. Water Code, §§ 13260 – 13269; 23 CCR Chapter 9. The code requires adequate protection of water quality by appropriate design, sizing and construction of erosion and sediment controls. Discharge of waste earthen material into surface waters resulting from land disturbance may require filing of a report

of waste discharge (Water Code § 13260(a)) and provides for issuance of waste discharge requirements with the respect to the discharge of any waste that can affect the quality of the waters of the state. Concerning potential surface water pollution from project area runoff, the waste discharge requirements may incorporate requirements based on the following source of recommended methods or procedures: California Regional Water Quality Control Board, 1996, Erosion and Sediment Control Field Manual.

Administering Agency. The administering agency for the above authority is the CEC, the SDWQCB, and the State Water Resources Control Board.

5.4.5.3 Local

County of San Diego Code of Regulatory Ordinances, Title 8, Division 7. This section of the Code establishes grading and excavation requirements during the construction phase of the project.

Administering Agency. The administering agency for the above authority is the County of San Diego.

5.4.5.4 Agencies and Agency Contacts

Agencies with jurisdiction to issue applicable permits and/or enforce LORS related to soils resources and agriculture are shown in Table 5.4-6.

TABLE 5.4-6
AGENCY CONTACTS

Agency	Contact	Telephone
County of San Diego Department of Planning and Land Use 5201 Ruffin Road, Suite B San Diego, CA 92123	Shelley Williams, Permit Process Coordinator	(858) 694-3280

5.4.5.5 Applicable Permits

Table 5.4-7 lists all applicable permits for soil resources.

TABLE 5.4-7
APPLICABLE PERMITS

Jurisdiction	Potential Permit Requirements	Schedule
Federal	No federal permits were identified	Not applicable
State	No state permits were identified	Not applicable
Local	Grading Permit from the County of San Diego (non-discretionary)	Prior to grading activities

5.4.6 References

Bechtel Power Corporation, 1999; Geotechnical Investigation, Appendix G to OMGP AFC.

California Department of Conservation, Division of Land Resource Protection. 2006. San Diego County Important Farmland 2006, Sheet 1 of 2. August, 2008.

GEOCON Incorporated, 2010; Geotechnical Investigations, Alta Road Parcels 1 and 2, PM20473, San Diego County, California, for SD Commercial, LLC, Project No. G1179-42-01, February 10.

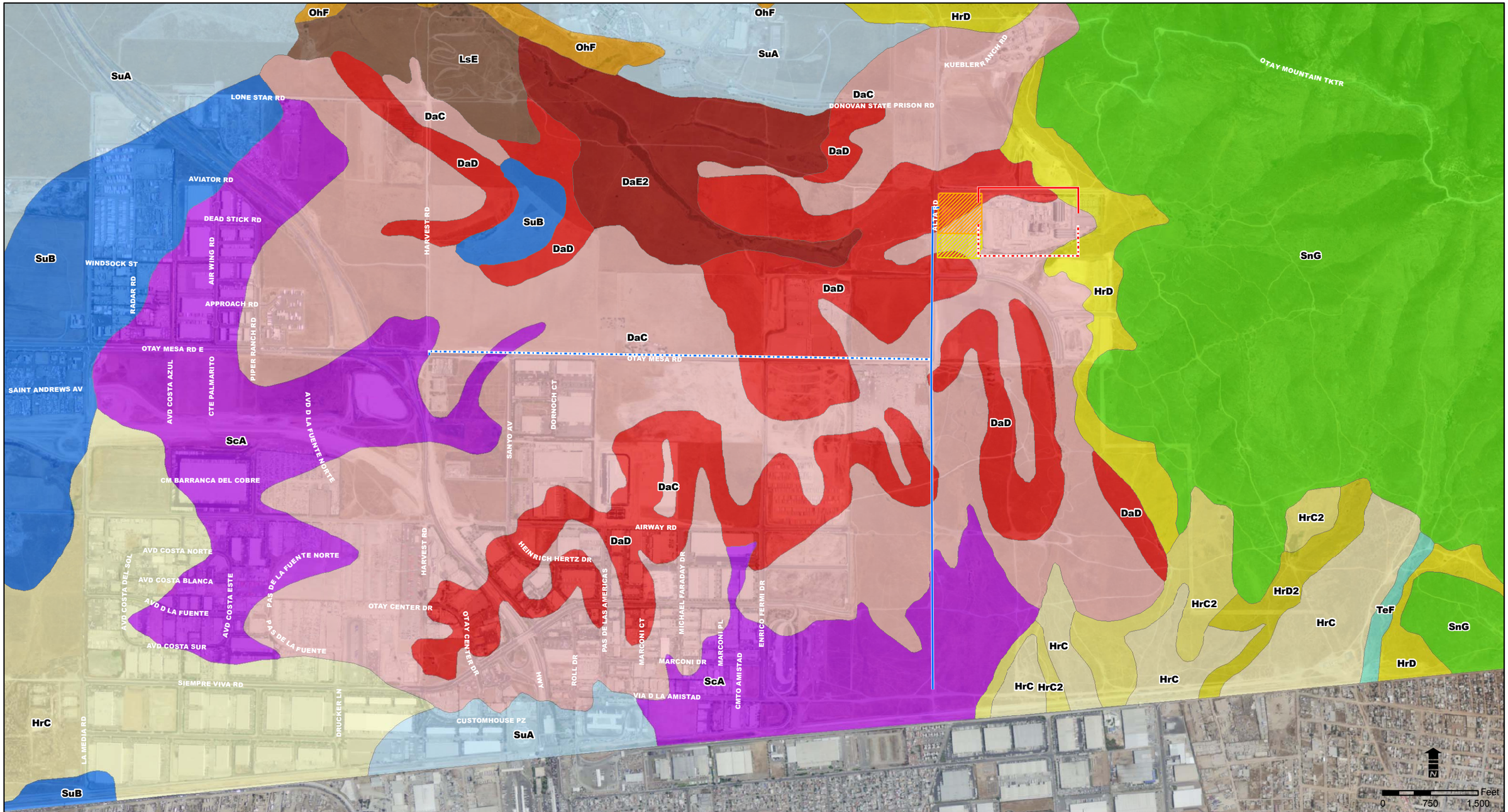
Pio Pico Energy Center (PPEC), 2011; Preliminary Draft, Drainage, Erosion, and Sediment Control Plan (DESCP), Pio Pico Energy Center, San Diego County, California, January.

Williamson Act Program - Basic Contract Provisions; 2010. http://www.consrv.ca.gov/dlrp/lca/basic_contract_provisions/Pages/wa_overview.aspx.

Tan, Siang S. and Michael P. Kennedy, 2002. Geologic Map of the Otay Mesa 7.5' Quadrangle San Diego County, California: A Digital Database. United States Geological Survey.

United States Department of Agriculture, Natural Resources Conservation Service; Web Soil Survey. 2010. http://.nrcs.usda.gov//. Website accessed April 9, 2010.

U.S. Geological Survey. 1996. Otay Mesa. 1:24,000-Scale Topographic Map.



Legend

- Project Site
- Laydown Area
- Route A 230 kV Transmission Line
- Route B 230 kV Transmission Line
- Route A Natural Gas Line
- Route B Natural Gas Line
- DaC, Diablo clay, 2 to 9 percent slopes
- DaD, Diablo clay, 9 to 15 percent slopes
- DaE2, Diablo clay, 15 to 30 percent slopes, eroded
- HrC, Huerhuero loam, 2 to 9 percent slopes
- HrC2, Huerhuero loam, 5 to 9 percent slopes, eroded
- HrD, Huerhuero loam, 9 to 15 percent slopes
- HrD2, Huerhuero loam, 9 to 15 percent slopes, eroded
- LsE, Linne clay loam, 9 to 30 percent slopes
- OhF, Olivenhain cobbly loam, 30 to 50 percent slopes
- ScA, Salinas clay, 0 to 2 percent slopes
- SnG, San Miguel-Exchequer rocky silt loams, 9 to 70 percent slopes
- SuA, Stockpen gravelly clay loam, 0 to 2 percent slopes
- SuB, Stockpen gravelly clay loam, 2 to 5 percent slopes
- TeF, Terrace escarpments

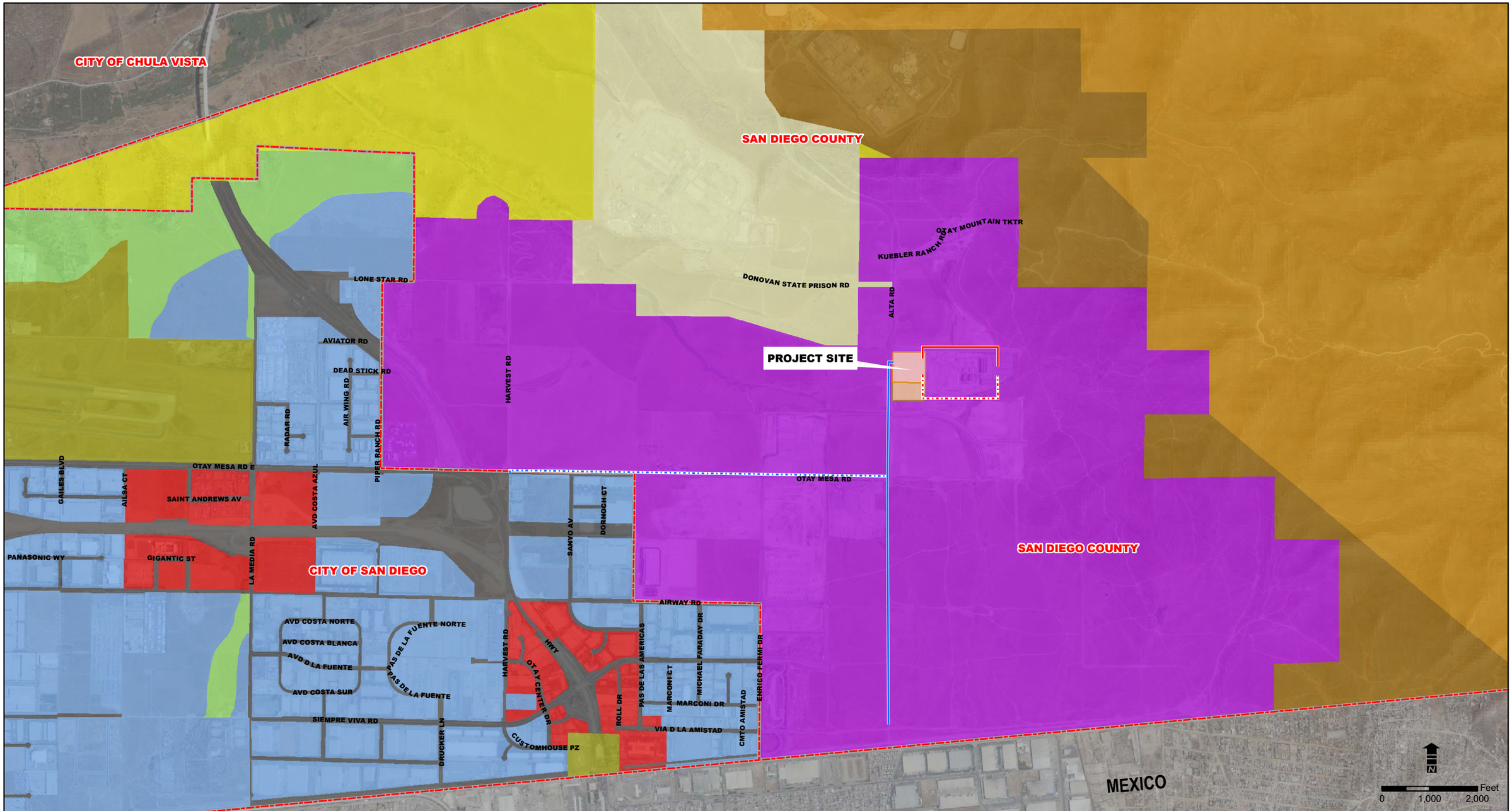
FIGURE 5.4-1
SOILS

PIO PICO ENERGY CENTER

PROJECT NO.: 29874638
DATE: DECEMBER 2010

URS

Source: Natural Resources Conservation Service (NRCS), CA638 Soil Survey (Pacific Southwest), 2007



Legend

- Jurisdictional Boundary
- Project Site
- Laydown Area
- Route A 230 kV Transmission Line
- Route B 230 kV Transmission Line
- Route A Natural Gas Line
- Route B Natural Gas Line
- Roads / Freeways / Transportation
- Industrial Employment
- Commercial Employment, Retail, & Services
- Park, Open Space, & Recreation
- Institutional & Public and Semi-Public Facilities
- Impact Sensitive 1 DU/4,8,20 Acres
- Public/Semi-Public Lands
- Multiple Rural Use 1 DU/4,8,20 Acres
- Estate Residential 1 DU/2,4 Acres
- Specific Plan Area

FIGURE 5.4-2
EXISTING LAND USE

PIO PICO ENERGY CENTER

PROJECT NO.: 29874839
DATE: DECEMBER 2010

URS

Source: City of San Diego General Plan Land Use (2008) and General Plan for the County of San Diego (1995).

Adequacy Issue: Adequate _____ Inadequate _____ **DATA ADEQUACY WORKSHEET** Revision No.: 0 Date: _____

Technical Area: **SOILS** Project: Pio Pico Energy Center Technical Staff: _____
Project Manager: _____ Docket: _____ Technical Senior: _____

Siting Regulations	Information	AFC Page Number And Section Number	Adequate Yes Or No	Information Required To Make AFC Conform With Regulations
Appendix B (g) (1)	...provide a discussion of the existing site conditions, the expected direct, indirect and cumulative impacts due to the construction, operation and maintenance of the project, the measures proposed to mitigate adverse environmental impacts of the project, the effectiveness of the proposed measures, and any monitoring plans proposed to verify the effectiveness of the mitigation.	Section 5.4 (pgs. 5.4-1 through 5.4-16)		
Appendix B (g) (15) (A)	A map at a scale of 1:24,000 and written description of soil types and all agricultural land uses that will be affected by the proposed project. The description shall include:	Fig. 5-4.1 Section 5.4.1.2 (pgs. 5.4-2 through 5.4-4) Section 5.9.1.2		
Appendix B (g) (15) (A) (i)	The depth, texture, permeability, drainage, erosion hazard rating, and land capability class of the soil;	Section 5.4.1.2 (pgs. 5.4-2 through 5.4-4)		
Appendix B (g) (15) (A) (ii)	An identification of other physical and chemical characteristics of the soil necessary to allow an evaluation of soil erodibility, permeability, re - vegetation potential, and cycling of pollutants in the soil-vegetation system;	Section 5.4.1.2 (pgs. 5.4-2 through 5.4-4) and Section 5.4.2.4 (pg. 5.4-11)		
Appendix B (g) (15) (A) (iii)	The location of any proposed fill disposal or fill procurement (borrow) sites; and	N/A		
Appendix B (g) (15) (A) (iv)	The location of any contaminated soils that could be disturbed by project construction.	N/A		
Appendix B (g) (15) (B)	An assessment of the effects of the proposed project on soil resources and agricultural land uses. This discussion shall include:	Section 5.4.1.2 (pg. 5.4-4) and Section 5.4.2 (pgs. 5.4-4 through5.4-11)		
Appendix B (g) (15) (B) (i)	The quantification of accelerated soil loss due to wind and water erosion; and	Section 5.4.2.2 (pgs. 5.4-6 through 5.4-11) Tables 5.4-2 through 5.4-4		
Appendix B (g) (15) (B) (ii)	The effect of power plant emissions on surrounding soil-vegetation systems.	Sections 5.4.2.4 (pg. 5.4-11) and 5.4.3 (pg. 5.4-12)		
Appendix B (i) (1) (A)	Tables which identify laws, regulations, ordinances, standards, adopted local, regional, state, and federal land use plans, leases, and permits applicable to the proposed project, and a discussion of the applicability of, and conformance with each. The table or matrix shall explicitly reference pages in the application wherein conformance, with each law or standard	Section 5.4.5 (pgs. 5.4-13 through 5.4-14) Table 5.4-5 (pg. 5.4-13)		

Siting Regulations	Information	AFC Page Number And Section Number	Adequate Yes Or No	Information Required To Make AFC Conform With Regulations
	during both construction and operation of the facility is discussed; and			
Appendix B (i) (1) (B)	Tables which identify each agency with jurisdiction to issue applicable permits, leases, and approvals or to enforce identified laws, regulations, standards, and adopted local, regional, state and federal land use plans, and agencies which would have permit approval or enforcement authority, but for the exclusive authority of the commission to certify sites and related facilities.	Section 5.4.5.4 (pg. 5.4-15) Table 5.4-7 (pg. 5.4-15)		
Appendix B (i) (2)	The name, title, phone number, address (required), and email address (if known), of an official who was contacted within each agency, and also provide the name of the official who will serve as a contact person for Commission staff.	Section 5.4.5.4 (pg. 5.4-15) Table 5.4-6 (pg. 5.4-15)		
Appendix B (i) (3)	A schedule indicating when permits outside the authority of the commission will be obtained and the steps the applicant has taken or plans to take to obtain such permits.	Section 5.4.5.5 (pg. 5.4-15) Table 5.4-7 (pg. 5.4-15)		