7.9 SOILS

7.9 SOILS

This section describes the environmental effects of the construction and operation of the proposed project on soils in accordance with CEC requirements. Impacts are assessed for the site of the proposed new generating facility, the construction laydown area, and the temporary access road route and gas line connection route (referred to as the "linear" features).

Section 7.9.1 provides a description of the existing environment that may be affected. Section 7.9.2 identifies environmental impacts from development of the proposed project, and Section 7.9.3 presents possible mitigation measures. Section 7.9.4 presents the laws, ordinances, regulations and standards (LORS) applicable to soils. Section 7.9.5 describes the agencies involved and provides agency contacts, and Section 7.9.6 describes required permits.

7.9.1 Affected Environment

San Bernardino County is located in southern California approximately 35 miles east of Los Angeles. The proposed project site is located on approximately 17 acres of which approximately 16.2 acres is within the northwest portion of the Etiwanda Generating Station (EGS) and approximately 0.8 acres is on land currently owned by Inland Empire Utility Agency. The site is within southwestern San Bernardino County in the City of Rancho Cucamonga. The site has been historically used as a power plant prior to most of the other development in the general vicinity and is surrounded by other industrial and commercial uses. While Rancho Cucamonga and most of the surrounding area was used for agriculture, most of this land use type disappeared about the time the existing plant was originally constructed in the early 1950s.

Much of San Bernardino County is made up of alluvial valley floors, fans, and terraces. The regional elevation in this area ranges from 600 to 3,400 feet and the average annual rainfall ranges from 12 to 18 inches (USDA, 1980). Soils are mapped and described at the level of "mapping units," which are defined to the approximate level of detail appropriate for soil management decision making. The locations and properties of the soil mapping units were identified from maps of the area prepared by the U.S. Soil Conservation Service (now called the Natural Resources Conservation Service (NRCS)) and presented in the Soil Survey of San Bernardino County, Southwestern Part, California (USDA, 1980). Figure 7.9-1 presents a detailed map of the soils in the vicinity of the proposed project site from this reference.

7.9.1.1 Soil Types Affected

Soil types in the vicinity of the proposed project site are shown on Figure 7.9-1 and described in Table 7.9-1. Following is a description of the map units identified within the site (USDA, 1980).

Proposed Project Site

Map Unit TuB, Tujunga loamy sand. The proposed project site consists of level to moderately sloping soils, 0 to 9 percent, which were formed by alluvial fans from the foothills of the San Gabriel Mountains. The soil is slightly acidic, and light brown loamy sand to brown coarse sand. The soil is very permeable, and runoff is slow to very slow. Roots can penetrate to a depth of 60 inches or greater. Vegetation is sparse with some sagebrush, annual grasses, and forbs. The hazard of erosion is slight, but if left unprotected the potential for erosion is moderate to high. Available water capacity is 4 to 5 inches.

Surrounding Area

The surrounding area within a mile radius consists of Tujunga loamy sand, Hanford coarse sandy loam, Tujunga gravelly loamy sand, and Soboba gravelly loamy sand. In addition, Delhi fine sand (described

Table 7.9-1

Soil Mapping Units – SGGS and Surrounding Area
Description and Properties

Map Symbol	Soil Series	Texture	Slope (%)	Unit Thickness (inches)	Drainage	USCS Classification	Permeability	Erosion Hazard (bare areas)	Hydrologic Soil Group	Storie Index (approx.)	Land Capability[a]	pH	Salinity (Mmhos per cm at 25°C)	Parent Material
Db	Delhi	Fine sand	0-15	60	Well	SP-SM	Slow	Moderate	B	62	IIIe-4 (irr.)	5.6-7.3	---	Granitic Material
HaC	Hanford	Coarse Sandy Loam	2-9	10	Well to Moderate	SM	Slow to Moderate	Slight to Moderate	B	86	IIe-1 (irr.)	6.1-7.8	0-2	Granitic Alluvium
SoC	Soboba	Gravelly Loamy Sand	0-9	36	Well	SP-SM	Slow	Slight	A	29	VIs-1 (non-irr.)	6.1-6.5	< 1	Granitic Alluvium
TuB	Tujunga	Loamy Sand	0-5	60	Well	SP-SM	Slow	Slight	A	70	IIIe-4 (irr.)	6.1-7.3	---	Granitic Alluvium
TvC	Tujunga	Gravelly Loamy Sand	0-9	36-40	Well	SP-SM	Slow	Slight	A	34	IVs-4 (irr.)	6.1-7.3	---	Granitic Alluvium

Notes:

USCS = Unified Soil Classification System

[a] Land Capability – An indication of the suitability of soils for most kinds of field crops. Capability classes are I through VIII. Subclasses are letters e, w, s, or c. Units are 0 through 9.

Source: USDA, Soil Conservation Service, 1980.

immediately below) is located adjacent to the southwest corner of the proposed project site and beyond the site to the south, west, and southwest. The temporary access road will be on Tujunga loamy sand and Delhi fine sand.

Map Unit Db, Delhi fine sand. The area south, west, and southwest of the proposed project site consists of fine sand with zero to 15 percent slopes, which were formed on alluvial fans in coarse-textured, wind-smoothed granitic soil. The soil is slightly acidic, and light brown to light yellowish-brown fine sand to medium sand to a depth of 60 inches or greater. The soil is very permeable, and runoff is very slow. Roots can penetrate to a depth of 60 inches or greater. Vegetation is annual grasses and forbs. The hazard of erosion is slight, but if unprotected the hazard of erosion is high. Available water capacity is 4 to 5 inches.

Map Unit HaC, Hanford coarse sandy loam. Portions of the construction laydown areas may be on Hanford coarse sandy loam. This soil type consists of gently sloping to moderately sloping soils, 2 to 9 percent, which were recently formed by alluvial fans from the foothills of the San Gabriel Mountains. The soil is slightly acidic to neutral and light brown to very light brown sandy loam; however, the surface layer is light brownish-gray coarse sandy loam approximately 10 inches thick. There are patches of Tujunga loamy sand with 0 to 5 percent slopes. The soil is very permeable and runoff is slow to medium. Roots can penetrate to a depth of 60 inches or greater. Vegetation is sparse with annual grasses and forbs. The hazard of erosion is slight to moderate if left unprotected. Available water capacity is 7 to 8 inches.

7.9.1.2 Soil Loss and Erosion

The Universal Soil Loss Equation is typically used to quantify water-induced soil loss in agricultural areas. The Universal Soil Loss Equation was used to estimate the potential amount of soil erosion from the project area for construction conditions. The existing plant site is characterized as general to heavy industrial land. Based on an approximately two-year construction period (22 months), the estimated soil loss for the entire 17-acre project site is approximately 20 tons while the estimated soil loss for the offsite and onsite laydown areas are about 18 tons and 14 tons, respectively. The Universal Soil Loss Equation uses the worst-case factors. During construction, the proposed project site and the construction laydown area will be disturbed. At that time, the area will be void of vegetation and have the highest potential for erosion. Soil erosion would be reduced through rainstorm events and best management practices, which include watering to suppress dust, providing straw bales and silt fences, and limiting exposed areas. When the proposed project construction is completed, the construction laydown area will be reseeded and returned to preconstruction conditions. The proposed project site will either be covered with facilities or paved; therefore, there would be no potential for soil erosion. During construction, the potential for erosion would be greater than for existing conditions but will be managed to minimize impacts. After construction, the potential for erosion will be negligible compared with existing conditions.

7.9.2 Environmental Consequences

Significance criteria have been selected based on California Environmental Quality Act (CEQA) Guidelines as well as performance standards adopted by responsible agencies. An impact may be considered significant from an agriculture and soil standpoint if the project results in substantial soil erosion or loss of topsoil.

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 surface receiving waters downstream of the construction project site. The magnitude, extent, and duration of this construction-related impact depends on the erodability of the soil; the proximity of the construction activity to a receiving water body; and the construction methodologies, duration, and season. The erosion characteristics of the soil types within the proposed project site are minimal. In addition, best management practices (BMPs) will be implemented during construction; therefore, impacts from soil erosion are expected to be less than significant.

Construction of the proposed project would result in soil compaction due to the erection of foundations and paving. Soil compaction would also result from vehicle traffic along temporary access roads and in the equipment staging area. Compaction densifies the soil, thereby reducing pore space and impeding water and gas movement through this medium, which can result in increased runoff, erosion, and sedimentation. The incorporation of BMPs during project construction will result in less-than-significant impacts from soil compaction. Soil removed from the site in preparation for construction of foundations and other project facilities will be stockpiled and reused on site after construction is completed. A grading plan will be prepared and a grading permit will be obtained from the City of Rancho Cucamonga prior to construction.

Plant operations would not result in impacts to the soil from erosion or compaction. Routine vehicle traffic during plant operation will be limited to existing roads, all of which are paved, and standard operational activities should not involve the disruption of soil.

Mass grading associated with the plant construction is intended to be balanced, with approximately 30,000 cubic yards (cy) of cut and 30,000 cy of fill. The maximum cut of about 9 feet will be at the northwest corner of the site. The maximum fill of about 3 feet will be located in the southeast corner of the site near the ammonia tanks. In the power block the maximum depth of excavation will be about 16 feet for electric manholes and ductbanks and about 17 feet for the sump. The maximum depth of excavation for sewers will be about 8 feet, providing for 5 feet of cover over a 36-inch-diameter pipeline. Earthwork required for the offsite laydown area will be balanced, about 2 feet of cut and 2 feet of fill representing approximately 40,000 cy.

7.9.3 Cumulative Impacts

Past and current development in the project vicinity has not resulted in a cumulatively significant impact to soils. Relevant future projects identified in Section 7.4.3 would also not be expected to result in a cumulatively significant impact to soils. By definition, the proposed project would not therefore contribute to a cumulatively significant impact, and cumulative impacts of the proposed project would be less than significant.

7.9.4 Mitigation Measures

To minimize soil erosion and sedimentation, best management practices will be used during construction activities. Temporary erosion control measures would be required during the construction period to help maintain water quality, protect the site and surrounding property from erosion damage, and prevent accelerated soil erosion or dust generation. These measures will be in place before construction begins and will be removed after completion.

7.9.4.1 Temporary Erosion Control Measures

Typically, temporary erosion control measures include revegetation, slope stabilizers, dust suppression, construction of berms and ditches, and sediment barriers. Vegetation is the most efficient form of erosion control because it stabilizes the soil and maintains the landscape; however, it would not be used due to the industrial environment.

During construction of the proposed project, dust erosion control measures will be used to minimize the windblown erosion of soil from the proposed project site. Clean water will be sprayed on the soil in construction areas to suppress dust.

Sediment barriers, such as straw bales or silt fences, slow runoff and trap sediment. They are usually placed below the disturbed area. Sediment barriers are often placed around sensitive areas, such as wetlands or creeks, to prevent contamination by sediment-laden water. Barriers will be placed around the site boundary to prevent sediment from leaving the site. Because the proposed project site is relatively

level, standard surface erosion control techniques should be effective. Soil stockpiles generated during construction will be covered and protected from rainfall if left on site for long periods.

7.9.4.2 Permanent Erosion Control Measures

Permanent erosion control measures include drainage systems. Due to the proposed project site's gently sloping and nearly level terrain, additional long-term measures should not be required.

7.9.5 Laws, Ordinances, Regulations and Standards

The proposed project will be constructed and operated in accordance with all LORS applicable to agricultural and soil resources. Federal, state, and local LORS applicable to agriculture and soils are discussed below and summarized in Table 7.9-2.

Table 7.9-2
Applicable Soils Laws, Ordinances, Regulations, and Standards

Laws, Ordinances, Regulations, and Standards	Applicability	Administering Agency	AFC Section
Federal			
Clean Water Act	Federal Regulation of wastewater and stormwater. Controls erosion of soil and disruption or displacement of surface soil.	U.S. EPA, RWQCB	7.9.5, 7.14.5
State			
Porter-Cologne Water Quality Act	State regulation of soil erosion during construction	RWQCB	7.9.5, 7.14.5
California Environ-mental Quality Act	Requires evaluation of impacts of project on prime agricultural land.	CEC	7.9.5
Local			
City of Rancho Cucamonga, Building and Safety Department	Requires grading permits which outline requirements relating to soil erosion control. According to the CBC, a grading permit is required if more than 50 cubic yards of soil are moved.	City of Rancho Cucamonga	7.9.2

Notes:
CBC = California Buildings Standards Code
CEC = California Energy Commission
RWQCB = Regional Water Quality Control Board
U.S. EPA = U.S. Environmental Protection Agency

7.9.5.1 Federal

The Clean Water Act (CWA) empowers the U.S. EPA with regulation of wastewater and stormwater discharges into surface waters by using National Pollutant Discharge Elimination System (NPDES) permits and pretreatment standards. At the state level, these permits are issued by the Regional Water Quality Control Boards (RWQCB), but the U.S. EPA may retain jurisdiction at its discretion. The CWA's primary effect on the proposed project site is with respect to the control of soil erosion during construction.

7.9.5.2 State

The Porter-Cologne Water Quality Control Act of 1972 is the state equivalent of the federal CWA, and its effect on the proposed project site would be similar. The Santa Ana RWQCB, which controls surface water discharge, may become involved indirectly if soil erosion threatens water quality. The CEQA requires an evaluation of impacts on state prime agricultural lands by the proposed project site if construction will cause substantial flooding, soil erosion, or sedimentation. Several plans, which include a stormwater pollution prevention plan, a soil erosion control plan, and a construction grading plan will be prepared in accordance with local and regional guidelines.

7.9.5.3 Local

Chapter 10 of the County of San Bernardino Development Code outlines requirements needed for the approval of a grading permit. Both the County of San Bernardino and the City of Rancho Cucamonga have LORS with specific soil erosion control and water quality protection requirements.

7.9.6 Involved Agencies and Agency Contacts

The following table presents agencies and agency contacts that will be monitoring the project.

Issue	Agency/Address	Contact/Title	Telephone
Soil erosion	Santa Ana Regional Water Quality Control Board 3737 Main Street, Suite 500, Riverside, CA 92501-3348	Mark Smythe, Section Chief, Storm Water Unit	(909) 782-4998
Grading	City of Rancho Cucamonga, Building and Safety Department 10500 Civic Center Drive, Rancho Cucamonga, CA 91730	William Makshanoff, Building Official, Building and Safety Department	(909) 477-2710

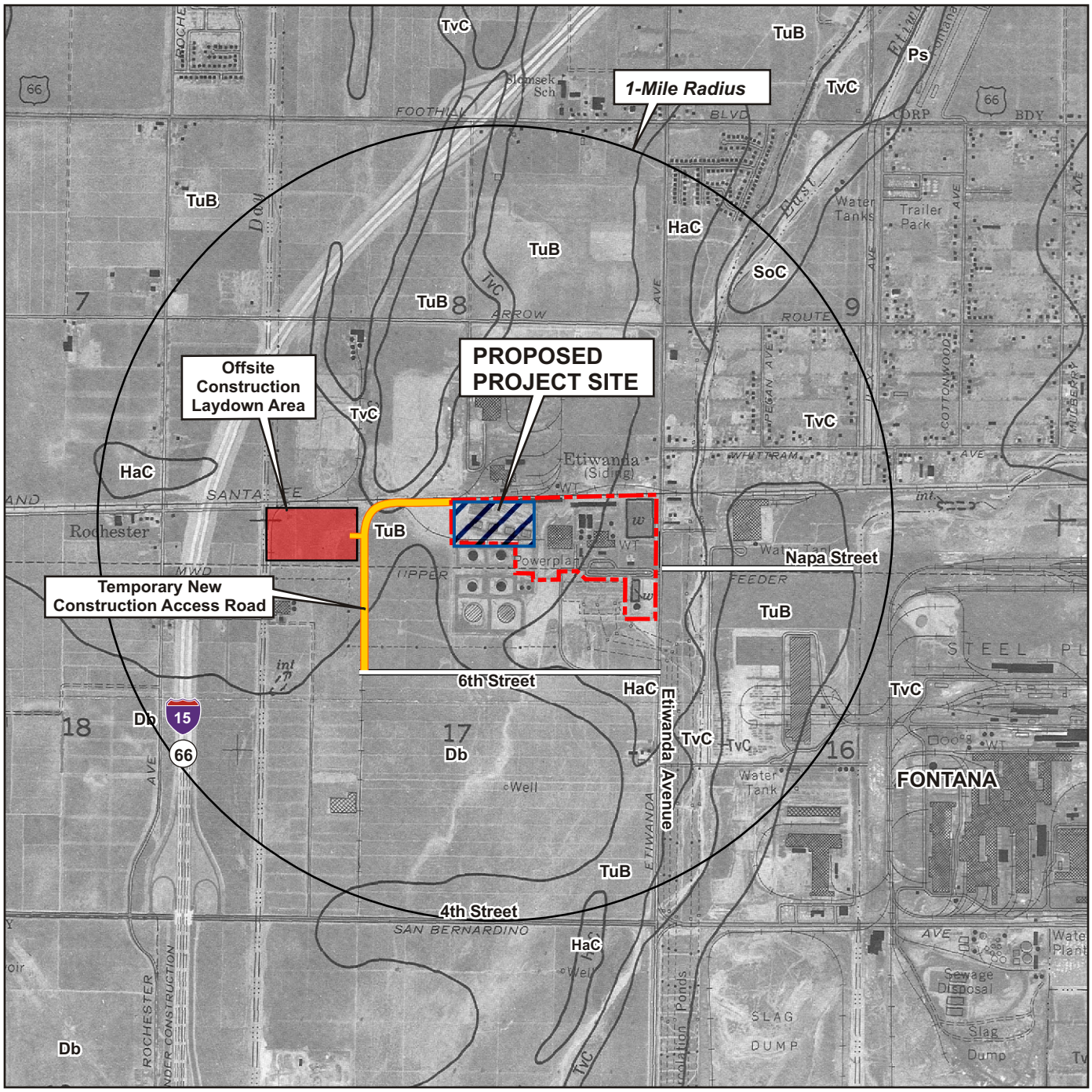
7.9.7 Permits Required and Permit Schedule

Responsible Agency	Permit/Approval	Schedule
Santa Ana Regional Water Quality Control Board (SARWQCB)	General Construction Activity Storm Water Permit	At least 30 days prior to construction, Applicant must submit Notice of Intent to SARWQCB.
City of Rancho Cucamonga, Building and Safety Department – A plan check worksheet must be submitted to and approved by the City prior to the City issuing a Grading Permit	Grading Permit	Prior to earth moving activities the Applicant must obtain Grading Permit. Initial review of plan check worksheet requires ten City working days (Monday through Thursday) for initial review, then five City working days for subsequent reviews.

The NOI to comply with the General Construction Activity Stormwater Permit will be submitted to the Santa Ana RWQCB, and a grading permit will be obtained from the City of Rancho Cucamonga Building and Safety Department before construction begins. Other required permits are discussed in Section 7.14, Water Resources.

7.9.8 References

USDA, Soil Conservation Service, 1980. Soil Survey of San Bernardino County, Southwestern Part, California.



LEGEND

Db	Delhi fine sand
HaC	Hanford coarse sandy loam
SoC	Soboba gravelly loamy sand
TuB	Tujunga loamy sand
TvC	Tujunga gravelly loamy sand
	Proposed Project Site
	EGS Property Boundary

N

0 2000 4000

Scale in Feet
1:24,000

Source:
US Department of Agriculture, Soil Conservation Service, San Bernardino County, Guasti Quadrangle, California, 1975

SITE LOCATION MAP WITH SOIL MAPPING UNITS

San Gabriel Generating Station
April 2007 San Gabriel Power Generation, LLC
28067169 Rancho Cucamonga, California

URS

FIGURE 7.9-1

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