# 5.11 Soils

This section describes the potential effects of the construction and operation of the NCPA Lodi Energy Center (LEC) on soil resources and is organized as follows: Section 5.11.1 describes the existing environment that could be affected, including soil types and their use (such as agriculture); Section 5.11.2 identifies potential environmental effects, if any, from project development; Section 5.11.3 discusses cumulative effects; Section 5.11.4 presents mitigation measures; Section 5.11.5 presents the laws, ordinances, regulations, and standards (LORS) applicable to soils and their use; Section 5.11.6 provides agency contacts for all involved agencies; Section 5.11.7 describes permits required for the project; and Section 5.11.8 provides the references used to develop this section.

## 5.11.1 Affected Environment

The proposed LEC project site is located on land owned and incorporated by the City of Lodi, approximately 6 miles to the west of the Lodi city center. The project site is adjacent to the City of Lodi's Water Pollution Control Facility (WPCF) to the east, treatment and holding ponds associated with the WPCF to the north, the existing NCPA Combustion Turbine Project #2 (STIG plant) to the west, and the San Joaquin County Mosquito and Vector Control facility to the south.

The proposed LEC site is on land zoned for public utility use and power generation. Surrounding land use is primarily agricultural, with the exception of the WPCF to the north and east, the STIG plant to the west, and the San Joaquin County Mosquito and Vector Control facility to the south. Interstate 5 (I-5) runs in a roughly north-south direction along the eastern side of the proposed laydown areas A and B (see Figure 5.11-1). A rural residential property is located within 1 mile to the northeast of the proposed LEC site. Two additional rural residences are located outside of the 1 mile radius to the north-northeast and east-southeast, respectively. Although the proposed LEC project site is surrounded by agricultural land, the proposed project site and laydown areas are located on land that is currently in use for equipment storage for the WPCF.

The four proposed LEC project laydown and/or parking areas (A through D) are to the east and northeast of the proposed LEC site. The LEC will connect with the existing 230-kV electrical transmission system, owned by PG&E, west of the STIG plant. Natural gas will be supplied by a proposed underground pipeline that will run for 2.5 miles east from the LEC site. This pipeline will pass beneath I-5 along existing roadways and through open agricultural fields and connect to the PG&E gas transmission line #108 at the intersection of West Armstrong Road and a Union Pacific Railroad (UPRR) alignment. The project will connect with the WPCF for supplies of recycled process water, stormwater and sanitary sewer through existing utility connections to the proposed LEC site.

A description of the soils in the proposed project area was developed using the online and published Soil Survey of San Joaquin County, California (USDA-Natural Resources Conservation Service [USDA-NRCS], 2008; 1992). Descriptions of the soil mapping units were developed from the soil survey and the online soil series descriptions (Soil Survey Staff, 2008).

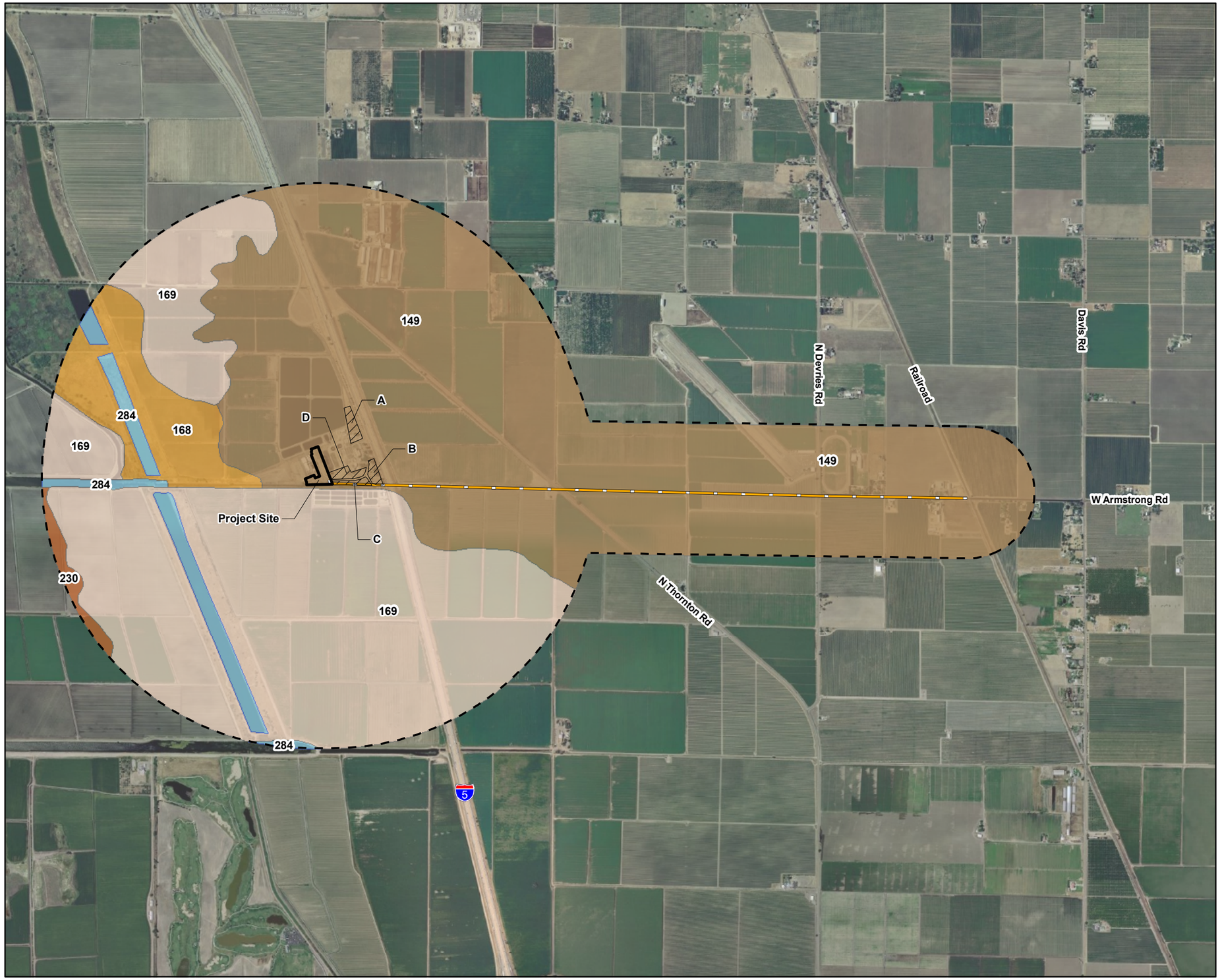
Soil map units for the project area are identified in Figure 5.11-1. Soil map unit characteristics for the area potentially affected by project construction are summarized in Table 5.11-1.

TABLE 5.11-1
Soil Mapping Unit Descriptions and Characteristics

| Map Unit | Description | |
|---|---|---|
| **149** | **Devries sandy loam, drained, 0 to 2 percent slopes:** | |
| | The entire LEC project site, all four laydown areas, and the natural gas pipeline cross this soil unit. | |
| | Formation: | On basin rims of the San Joaquin delta in alluvium derived from mixed rock sources |
| | Typical profile: | Sandy loam, fine sandy loam, or loam surface (13± inches thick) and upper subsoil (15± inches thick) over indurated hardpan (to a depth of 80± inches) |
| | Shrink-swell capacity: | Low (surface and upper subsoil; not given for lower subsoil) |
| | Depth and drainage: | Moderately deep above hardpan; Somewhat poorly drained; may be hydric, especially above hardpan |
| | Permeability: | Moderately rapid |
| | Runoff: | Slow |
| | Water Erosion: | Slight |
| | Wind Erosion: | Moderate |
| | Farmland Class: | Not a Prime Farmland |
| | Storie Index: | 18 (Grade 5), very poorly suited to agriculture; limited by drainage and rare flooding |
| | Capability class: | IVw-8 (irrigated and non irrigated), severe limitations due to low available water capacity because root zone less than 40 inches over a hardpan |
| | Taxonomic class: | Coarse-loamy, mixed, superactive, thermic Typic Duriaquolls |
| **169** | **Guard clay loam, drained, 0 to 2 percent slopes:** | |
| | The LEC project site and two laydown areas (B and C) are immediately north of this soil unit. Although not directly affected by proposed LEC facilities, they are close enough that these soil characteristics may be present. | |
| | Formation: | On basin rims of the San Joaquin delta in alluvium derived from mixed rock sources |
| | Typical profile: | Mottled clay loam surface (15+ inches thick) and subsoil (67+ inches thick). Soil is calcareous throughout and weakly cemented below 15 inches. |
| | Shrink-swell capacity: | Moderate (surface and substratum) |
| | Depth and drainage: | Very deep; Poorly drained |
| | Permeability: | Slow |
| | Runoff: | Slow |
| | Water Erosion: | Slight |
| | Wind Erosion: | Very slight |
| | Farmland Class: | Prime Farmland, if irrigated. Drainage system may be required. |
| | Storie Index: | 45 (Grade 3), fairly well suited to agriculture; limited by drainage and rare flooding |
| | Capability class: | IIIw-2 (irrigated) and IVw-2 (non irrigated), severe limitations due to wetness caused by poor drainage or flooding |
| | Taxonomic class: | Fine-loamy, mixed, superactive, calcareous, thermic Duric Endoaquolls |

Soil characteristics are based on soil mapping descriptions provided in the online soil survey (http://websoilsurvey.nrcs.usda.gov) (NRCS, 2008); in the published soil survey (NRCS, 1992); and in the online Official Series Descriptions (OSDs) (http://www2.ftw.nrcs.usda.gov/osd/dat) (Soil Survey Staff, 2008).

Soil descriptions provided above are limited to those soil units that could be directly affected by the LEC. Other soil mapping units are well outside of the project area but are shown on Figure 5.11-1 and include the following: **168** - Guard clay loam, 0 to 2 percent slopes, **230** – Ryde clay loam, partially drained, 0 to 2 percent slopes, and **284** – Water.




**LEGEND**

- Proposed Lay Down and/or Parking
- Proposed Plant Site
- Preferred Natural Gas Pipeline Route
- Buffer*

**Soil Type**

- Devries sandy loam, drained, 0 to 2 percent slopes (149)
- Guard clay loam, 0 to 2 percent slopes (168)
- Guard clay loam, drained, 0 to 2 percent slopes (169)
- Ryde clay loam, partially drained, 0 to 2 percent slopes (230)
- Water (284)

This map was compiled from various scale source data and maps and is intended for use as only an approximate representation of actual locations.

Notes:
1. *1 mile around Project Site, 1/4 mile around NG Pipeline.
2. Source: U.S. Department of Agriculture, Natural Resources Conservation Service, Soil Survey Geographic (SSURGO) database for San Joaquin County, California.

N

0 1,000 2,000
Feet

**FIGURE 5.11-1**
**SOIL TYPES WITHIN ONE MILE OF SITE**
LODI ENERGY CENTER
*LODI, CALIFORNIA*

CH2MHILL

SAC\\ZION\SACGIS\PROJ\LODIENERGYCENTER_371322\MAPFILES\SOILTYPES.MXD MHASKELL 8/21/2008 11:33:23

The project area includes the proposed LEC project site and linear features (i.e., overhead electrical lines and underground gas, sewer and water pipelines). Table 5.11-1 summarizes depth, texture, drainage, permeability, water runoff, and items related to revegetation potential. Actual soil conditions in the project area could differ from what is described in the generalized soil descriptions because of the potential for previous grading at the site and natural soil variation. For example, Devries is the dominant soil series in map unit 149 (85%); other soil components occupy up to 15 percent of the map unit, and these soils may have characteristics that are dissimilar to those described for the map unit.

#### 5.11.1.1 Agricultural Use

Based on a review of aerial photography, it appears that much of the land immediately surrounding the proposed LEC project site is used for agricultural production. Based on observations made during the biological field survey, most of this land was planted with forage crops (mostly alfalfa); however, it is expected that these fields may also be used at times for other row and grain crops depending on crop rotation cycles.

#### 5.11.1.2 Soil Mapping Units

Table 5.11-1 describes the properties of the soil mapping units that are found in the vicinity of the proposed LEC project site. As shown on Figure 5.11-1, the entire proposed LEC site and associated facilities lie within the soil mapping unit, 149 – Devries sandy loam, drained, 0 to 2 percent slopes. This soil mapping unit, which would be directly affected by the LEC project and associated facilities, primarily consists of moderately-coarse to medium textured soils (sandy loam, fine sandy loam, or loam) in alluvium that is derived from mixed rock sources. These soils are somewhat poorly drained and have moderately rapid permeability and slow runoff.

The soil mapping unit mapped immediately to the south of the LEC site and facilities was 169 – Guard clay loam, drained, 0 to 2 percent slopes. That soil mapping unit, which should not be directly affected by the proposed LEC project, consists primarily of moderately fine textured soils (clay loam) in alluvium that is derived from mixed rock sources. These soils are poorly drained and have slow permeability and slow runoff.

#### 5.11.1.3 Potential for Soil Loss and Erosion

The factors that have the largest effect on soil loss include long, steep slopes; lack of vegetation; and erodible soils with high proportions of silts and very fine sands. The soils found in the proposed LEC project area are nearly level, with an estimated average slope of less than two percent.

In general, soils at the proposed LEC project site are of moderately coarse to medium texture above the indurated hardpan, ranging from sandy or fine sandy loam to loam (NRCS, 1992). The erosion potential of these soils will vary, based on the wetness of the soil, soil compaction, sizes of soil particles, and other site-specific properties. Based on the soil survey information, the soils at the proposed LEC project site are expected to have slight water erosion potential and a moderate wind erosion potential.

It should be noted that given the historical filling and grading for the WPCF soil conditions at the proposed LEC project site may not be the same as those that have been mapped in the soil survey. The onsite soils could be imported soils of construction fill which, if exposed,

could be subject to different (higher or lower) rates of water and wind erosion than the native soils, depending on their actual properties and degree of compaction.

#### 5.11.1.4 Other Significant Soil Characteristics

While the surface and subsurface soils beneath the LEC project and associated facilities are not indicated to have high shrink-swell potential, the potential for soils with this property could represent a significant soil characteristic concerning the proposed LEC project site (NRCS, 1992). Because there was no shrink-swell information on the subsoil layer in the 149 soil mapping unit (Devries sandy loam, drained, 0 to 2 percent slopes) and because moderate shrink-swell potential was indicated in the adjacent soil mapping unit (169 - Guard clay loam, drained, 0 to 2 percent slopes), it is possible that soils with some shrink-swell potential could be found in the subsurface beneath the LEC site and along the gas pipeline alignment. The presence of expansive clays in the soil may affect its suitability as a bearing surface for foundations and pipelines because expansive clays shrink when dry and swell when wet, and thus have the potential to cause foundations or other structures built on them to crack, heave, or collapse. A preliminary geotechnical soil investigation (Carlton Engineering, 2008) confirmed that this soil condition could exist at the site and that additional geotechnical engineering evaluations were required to support design and construction for the LEC.

The 149 soil mapping unit (Devries sandy loam, drained, 0 to 2 percent slopes) soil unit may be subject to rare flooding events, particularly during years of abnormally high precipitation. These soils are characterized by an indurated hardpan at a depth of 20 to 40 inches. This characteristic may cause the soils above the hardpan to remain saturated after periods of prolonged precipitation. The hardpan will also limit the effective plant rooting depth, which will affect efforts to revegetate cleared soil areas. This hardpan will also affect the difficulty of excavation for the pipeline installation. The presence of existing subsurface drainage facilities within agricultural fields will also affect the way in which the gas pipeline excavation is planned and executed. Because deep ripping may be an agricultural practice in use in these fields for crop productivity, it will be necessary to install the gas pipeline deep enough so that the land may be returned to agricultural use after construction.

### 5.11.2 Environmental Analysis

The following sections describe the potential environmental effects on soils during the construction and operation phases of the project.

#### 5.11.2.1 Significance Criteria

The potential for impacts to soils resources and their uses (such as agriculture) were evaluated with respect to the criteria described in the Appendix G checklist of the California Environmental Quality Act (CEQA). An impact is considered potentially significant if it would:

- Involve changes in the existing environment which, because of their location or nature, could result in conversion of farmland to non-agricultural use
- Impact jurisdictional wetlands

- Result in substantial soil erosion
- Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (International Code Council, 1997), creating substantial risks to life or property

The following sections describe the anticipated environmental impacts on agricultural production and soils during project construction and operation.

#### 5.11.2.2 Farmland Conversions

The proposed LEC project site is adjacent to farmland in an area generally zoned for agricultural use. The project site currently consists of ruderal grass and weeds, and is zoned for public utility use and power generation. While the agricultural lands along the proposed gas pipeline route may potentially be under one or more Williamson Act contracts, the pipeline installation will not represent a farmland conversion to a non-agricultural use. The pipeline installation is actually a temporary impact because the land above the gas pipeline will be restored to its pre-construction use. The pipeline will be installed deep enough to allow future cultivation (including deep ripping). Furthermore, the topsoil removed during pipeline excavation will be stockpiled and used to restore the land to its original condition before construction. For these reasons, the LEC project will not result in the conversion of any agricultural land to a non-agricultural use.

#### 5.11.2.3 Jurisdictional Wetlands

Based on the field surveys by a qualified biologist/wetland scientist, there are no wetlands present on the proposed LEC project site or along the proposed natural gas pipeline alignment. A canal immediately south of the proposed LEC site and Laydown Area C was observed to contain wetland plants, such as tule (*Schoenoplectus acutus*) and cattail (*Typha latifolia*), and drains west to White Slough and is likely a jurisdictional "waters of the U.S.;" however, no activities are planned within the canal. Further east, between I-5 and North Thornton Road, agricultural ditch runs east to west along the south side of the proposed gas pipeline alignment, but not expected to be impacted by the proposed project. During the biological survey, this ditch was dry and had been cleared of vegetation with herbicide treatments. No direct link was observed between this ditch and the waters of the U.S. on the west side of I-5; therefore, this ditch was not considered likely to be a jurisdictional waters of the U.S. No other potential jurisdictional waters of the U.S. or wetlands were observed along the proposed gas pipeline route. Therefore, the proposed LEC will not impact jurisdictional wetlands or other waters of the U.S. Section 5.2, Biological Resources, addresses this topic in greater detail.

#### 5.11.2.4 Soil Erosion during Construction

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 site. The magnitude, extent, and duration of construction-related impacts depends on the erodibility of the soil; the proximity of the construction activity to the receiving water; and the construction methods, duration, and season.

Because conditions that could lead to excessive soil erosion are not present at the LEC project site, little soil erosion is expected during the construction period. In addition, best

management practices (BMPs) will be implemented during construction, as described in the Stormwater Pollution Prevention Plan (SWPPP) that is required for all construction projects over 1 acre under the general permit covering discharges of stormwater from construction activities. The California Energy Commission (CEC) also requires that project owners develop and implement a drainage, erosion, and sediment control plan (DESCP) to reduce the impact of runoff from a construction site. Therefore, impacts from soil erosion are expected to be less than significant. Monitoring will involve construction site inspections to ensure that the BMPs described in the SWPPP/DESCP are properly implemented and provide an effective combination of erosion and sediment controls.

Despite the low potential for soil erosion in the proposed LEC project area, estimates of erosion by water and wind are provided in the following sections.

#### 5.11.2.4.1 Water Erosion

An estimate of soil loss during construction by water erosion was developed using the Revised Universal Soil Loss Equation (RUSLE2), and is summarized in Table 5.11-2. Detailed calculations for the soil loss estimates are found in Appendix 5.11A.

TABLE 5.11-2
LEC Construction Soil Loss Estimates Using the Revised Universal Soil Loss Equation[a]

| Feature (acreage)[b] | Activity | Duration (months) | Soil Loss (tons) without BMPs | Soil Loss (tons) with BMPs | Soil Loss (tons/yr) No Project |
|---|---|---|---|---|---|
| Project Site – (4.4 acres) | Grading | 2 | 0.8 | 0.010 | 0.0233 |
| | Construction | 22 | 4.1 | 0.113 | — |
| Laydown Areas (A through D, 9.8 acres total) | Grading | 1 | 0.9 | 0.011 | 0.0519 |
| | Construction | 23 | 0.0 | 0.00 | — |
| Natural Gas Line – (1.25 acre for trench) and 9.45 acres for construction corridor) | Grading | 3 | 2.50 | 0.032 | 0.0482 |
| | Construction | 3 | 1.16 | 0.032 | — |
| Project Soil Loss Estimates | | 24 | 9.48 | 0.20 | 0.12 |

[a] Soil losses (tons/acre/year) are estimated using RUSLE2 software available online [http://fargo.nserl.purdue.edu/rusle2_dataweb/RUSLE2_index.htm].

[b] Acreages assume 30-ft corridors for the natural gas construction corridor. Trench for the natural gas pipeline is assumed to be 4-ft wide.

The following assumptions, which are also shown in Appendix 5.11A, were used in the model.

- The LEC construction site totals 4.4 acres. Active soil grading will occur over a 2-month period. The soil in this area will then be exposed for an additional 22 month construction period, after which the majority of the site will be paved or covered with LEC facilities. It is assumed that around 1/10$^{th}$ of the project site will have bare soil exposure during the construction period.

- Estimates of soil loss (in tons) were made for the site-specific soil mapping unit characteristics that were all available within the RUSLE2 database.
- RUSLE2 rainfall erosivity conditions were estimated for the LEC site coordinates using site-specific rainfall estimates from online National Weather Service data (NOAA Atlas 2) at online at http://hdsc.nws.noaa.gov/cgi-bin/hdsc/na2.html (verified May 29, 2008).
- A 100-foot slope length was assumed for all soil units. The median of each soil unit slope class was used for the RUSLE calculations. For this project, an average slope of 1 percent (i.e., mid-point of 0 to 2 percent slope class) was assumed for all soil units.

Soil losses are estimated using the following RUSLE2 conditions:

**Construction and demolition** soil losses were approximated using Management as 'bare ground, smooth surface;' Contouring: Rows up and down hill; Diversion/terracing: None; and Strips and Barriers: None.

**Active grading** soil losses were approximated using Management as 'bare ground, rough surface' soil conditions; Contouring: Rows up and down hill; Diversion/terracing: None; and Strips and Barriers: None.

**Construction** soil losses **with implementation of construction BMPs** was approximated using Management as Silt fence; Contouring: Perfect, no row grade; Diversion/terracing: None; and Strips and Barriers: two silt fences, one at end of RUSLE2 slope.

A **'No Project'** soil loss estimate was also approximated using Management as 'Dense grass – not harvested; Contouring: Rows up and down hill; Diversion/terracing: None; and Strips and Barriers: None.

With the implementation of appropriate BMPs that will be required under the National Pollutant Discharge Elimination System (NPDES) permit, the total project soil loss of 0.20 ton is considered to be a minimal amount and would not constitute a significant impact. It should also be recognized that the estimate of accelerated soil loss by water is very conservative (overestimate of soil loss) because of it assumes only a single BMP (i.e., silt fencing), whereas a SWPPP will require multiple soil erosion control measures.

#### 5.11.2.4.2 Wind Erosion

The potential for wind erosion of surface material was estimated by calculating the total suspended particulates (TSP) that could be emitted as a result of grading and the wind erosion of exposed soil. The total site area and grading duration were multiplied by emission factors to estimate the TSP matter emitted from the site. Fugitive dust from site grading was calculated using the default particulate matter less than 10 microns in equivalent diameter ($PM_{10}$) emission factor used in URBEMIS2002 and the ratio of fugitive TSP to $PM_{10}$ published by the Bay Area Air Quality Management District (BAAQMD, 2005). Fugitive dust resulting from the wind erosion of exposed soil was calculated using the emission factor in AP-42 (U.S. Environmental Protection Agency [EPA], 1995; also in Table 11.9-4 in BAAQMD, 2005).

Table 5.11-3 summarizes the mitigated TSP predicted to be emitted from the site from grading and the wind erosion of exposed soil. Without mitigation, the maximum predicted

erosion of material from the site is estimated at 2.12 tons over the course of the project construction cycle. This estimate is reduced to approximately 0.76 ton by implementing basic mitigation measures such as water application (see mitigation measures, below). These estimates are conservative because they make use of emission rates for a generalized soil rather than for site-specific soil properties.

TABLE 5.11-3
Soil Loss (TSP) from LEC Grading and Wind Erosion

| Emission Source | Acreage | Duration (months) | Unmitigated TSP (tons) | Mitigated TSP (tons) |
|---|---|---|---|---|
| **Grading Dust:** | | | | |
| Project Site | 4.4 | 2 | 0.151 | 0.053 |
| Laydown Areas (A through D) | 9.8 | 1 | 0.108 | 0.059 |
| Natural Gas Line (4-ft wide trench) | 1.21 | 3 | 0.382 | 0.134 |
| **Wind Blown Dust:** | | | | |
| Project Site | 4.4 | 22 | 0.307 | 0.107 |
| Laydown Areas (A through D) | 0.00 | 23 | 0.000 | 0.000 |
| Natural Gas Line (30-ft corridor) | 9.09 | 3 | 1.170 | 0.410 |
| **Estimated Total** | | 24 | 2.118 | 0.763 |

Notes: Assumptions for these calculations are found in Appendix 5.11A.

### 5.11.2.5 Expansive Soils

An important characteristic of the proposed LEC project site is the potential for soils with moderate to high shrink-swell potential. As previously explained in subsection 5.11.1.4, despite the fact that map unit 149 on which the project site is located has a low shrink-swell potential in the upper soil layers, there is a possibility that expansive soils may be found in the area. The presence of expansive clays in the soil may affect the suitability of the soil as a bearing surface for foundations and pipelines because expansive clays have the potential to shrink or swell in volume with changing moisture content.

Although the WPCF has already been built on another portion of the property, it shouldn't be assumed that the soils will behave similarly. Additionally, up to 15 percent of map units 149 and 169 may be made up of soil components that have properties that different from the dominant soil component. A preliminary onsite geotechnical evaluation was performed for the LEC property that indicated that expansive soils may be present on site (Carlton Engineering, 2008) but that the potential for damage to onsite structures was low. It was expected that expansive soils could be mitigated with standard design and construction techniques but that further geotechnical investigations should be completed to support both of these aspects of the project.

### 5.11.2.6 Compaction during Construction and Operation

Construction of the proposed project would result in soil compaction during the construction of foundations and paved roadway and parking areas. Soil compaction would

also result from vehicle traffic along temporary access roads and in the equipment staging (laydown) and parking areas. Soil compaction increases soil density by reducing soil pore space. This also reduces the ability of the soil to absorb precipitation and transmit gases for respiration of plant roots and soil microfauna. Soil compaction can result in increased runoff, erosion, and sedimentation. The incorporation of BMPs, in accordance with the SWPPP/DESCP guidelines during construction, will result in less-than-significant impacts from soil compaction.

Before use of the construction laydown and parking areas, minimal grading is expected because the site and proposed laydown areas are relatively flat. After grading, runoff from the site and laydown area would either occur as overland flow or infiltrate the soil and percolate to groundwater. However, the laydown and parking areas will likely be graveled to allow for wet season use and further minimize soil erosion potential. Heavy equipment stored onsite will be placed on dunnage to protect it from ground moisture. Once construction is completed, the gravel will either be removed from the site or incorporated into the site paving.

Because the LEC will be constructed in previously developed area, the amount of soil compaction that will be required to establish permanent road beds and foundation areas for buildings should be minimal. Because these areas will be paved or otherwise protected after construction, the overall anticipated effects of compaction during construction are considered to be less than significant.

Operation of the LEC 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 or will be graveled, and standard operational activities should not involve the disruption of soil. Therefore, impacts to soil from project operations would be less than significant.

#### 5.11.2.7 Effects of Emissions on Soil-Vegetation Systems

There is a concern in some areas that emissions from a generating facility, principally oxides of nitrogen from the combustors or drift from the cooling towers, would have an adverse effect on soil-vegetation systems in the project vicinity. This is principally a concern where environments that are highly sensitive to nutrients or salts, such as serpentine habitats, are downwind of the project. Aerial nitrogen deposition is also known to reduce the activity of mycorrhizal fungi in the soil.

The proposed LEC project will include a selective catalytic reduction (SCR) system to control NOx air emissions and a carbon monoxide (CO) catalyst to control carbon monoxide air emissions (one SCR/CO catalyst per exhaust train). The additional nitrogen from air emissions from the LEC would be negligible when compared to the fertilizers that are likely already being applied in cultivated fields. In addition, there are no serpentine habitats in or surrounding the project area. Therefore and the addition of small amounts of nitrogen to the area would result in less than significant impacts on soil-vegetation systems.

### 5.11.3 Cumulative Effects

A cumulative impact refers to a proposed project's incremental effect together with other closely related past, present, and reasonably foreseeable future projects whose impacts may

compound or increase the incremental effect of the proposed project (Public Resources Code § 21083; California Code of Regulations, title 14, § 15064(h), 15065(c), 15130, and 15355).

In July 2008, 21 projects were in various stages of progress with the City of Lodi. Most of these projects are zoned residential, with a few office, mixed use, institutional, commercial, and industrial projects proposed. All of these projects are more than 4 miles from the proposed project, except for the improvements at the White Slough WPCF (Draft EIR issued March 28, 2008), which is adjacent to the project site (Bereket, 2008; City of Lodi, 2008a).

In July 2008, 72 projects[1] were being processed with the San Joaquin County Building Department. These projects were located in Acampo, Escalon, Farmington, French Camp, Linden, Lodi, Lockeford, Manteca, Ripon, Stockton, and Tracy. The types of projects included residential projects such as new residences, additions and remodels to existing residences, mobile home renovations, and pool construction; commercial projects such as administration buildings, barns, and a riding arena; light industrial projects such as storage buildings, spray booths, and warehouses; office projects such as building conversions and tenant improvements; and institutional projects such as classroom relocation and facilities to house animals (Raborn, 2008).

As previously described, the project would have no permanent effect on agriculture because there are no agricultural uses of the LEC site and because agricultural uses would be restored along the gas pipeline alignment after construction. The project's expected minor to negligible effects on soil erosion, sedimentation, and compaction are not considered to be significant, particularly with the application of onsite construction BMPs. The LEC site is surrounded by rural land use, and there are no plans to develop these areas in the near future. Therefore, the potential for cumulative impacts of the proposed LEC combined with other projects would be insignificant.

## 5.11.4 Mitigation Measures

BMPs, in accordance with the SWPPP and DESCP, will be used to minimize erosion at the site during construction. These erosion-control measures would be required to help maintain water quality, protect property from erosion damage, and prevent accelerated soil erosion or dust generation that removes topsoil and destroys soil productivity. Temporary and permanent erosion and sediment control measures are described below. With implementation of control measures, soil erosion losses after construction are expected to be negligible.

### 5.11.4.1 Temporary Erosion Control Measures

Temporary erosion control measures would be implemented before construction begins, and would be evaluated and maintained during construction. These measures typically include revegetation, mulching, physical stabilization, dust suppression, berms, ditches, and sediment barriers. These measures would be removed from the site after the completion of construction.

[1] For the purposes of this discussion, San Joaquin County sorted its projects by project cost, and provided a list of the projects costing $25,000 or more.

During construction of the project, dust erosion control measures would be implemented to minimize the wind-blown loss of soil from the site. Water of a quality equal to or better than existing surface runoff would be sprayed on the soil in construction areas to control dust prior to completion of permanent control measures.

Sediment barriers slow runoff and trap sediment. Sediment barriers include straw bales, sand bags, straw wattles, and silt fences. They are generally placed below disturbed areas, at the base of exposed slopes, and along streets and property lines below the disturbed area. Sediment barriers are often placed around sensitive areas to prevent contamination by sediment-laden water near areas such as wetlands, creeks, or storm drains.

The site will be constructed on relatively level ground; therefore, it is not considered necessary to place barriers around the entire site perimeter. However, some barriers would be placed in locations (such as the southern boundary) where offsite drainage could occur to prevent sediment from impacting the canal or from leaving the other areas of the site. If used, sediment barriers would be properly installed (staked and keyed), then removed or used as mulch after construction. Runoff detention basins, drainage diversions, and other large-scale sediment traps are not considered necessary due to the small site size, level topography, and surrounding paved areas. Any soil stockpiles, including sediment barriers around the base of the stockpiles, would be stabilized and covered.

Mitigation measures, such as watering exposed surfaces, are used to reduce PM10 emissions during construction activities. The PM10 reduction efficiencies are taken from the SCAQMD CEQA Handbook (1993) and were used to estimate the effectiveness of the mitigation measures. Table 5.11-4 summarizes the mitigation measures and $PM_{10}$ reduction efficiencies. Additional fugitive dust mitigation measures are discussed in Section 5.1, Air Quality.

TABLE 5.11-4
Mitigation Measures for Fugitive Dust Emissions

| Mitigation Measure | $PM_{10}$ Emission Reduction Efficiency (%) |
|---|---|
| Water active sites at least twice daily | 34-68 |
| Enclose, cover, water twice daily, or apply non-toxic soil binders, according to manufacturer's specifications, to exposed piles (i.e., gravel, sand, dirt) with 5 percent or greater silt content | 30-74 |

Source: SCAQMD CEQA Handbook, Table 11-4 (1993)

### 5.11.4.2 Permanent Erosion Control Measures

Permanent erosion control measures on the site will include graveling, paving, and drainage systems, as well as revegetating to stabilize land surfaces.

## 5.11.5 Laws, Ordinances, Regulations, and Standards

Federal, state, county, and local LORS applicable to soils are discussed below and summarized in Table 5.11-5.

TABLE 5.11-5
Laws, Ordinances, Regulations, and Standards for Soils

| LORS | Requirements/ Applicability | Administering Agency | AFC Section Explaining Conformance |
|---|---|---|---|
| **Federal** | | | |
| Federal Water Pollution Control Act of 1972 (Clean Water Act) with amendments | Regulates stormwater discharge from construction and industrial activities | SWRCB and Central Valley RWQCB. | 5.11.5.1.1 |
| Natural Resources Conservation Service (1983), *National Engineering Handbook*, Sections 2 and 3 | Standards for soil conservation | Natural Resources Conservation Service | 5.11.5.1.2 |
| **State** | | | |
| Porter-Cologne Water Quality Control Act | Law for regulation of surface and ground water quality in the state | SWRCB and Central Valley RWQCB | 5.11.5.2.1 |
| **Local** | | | |
| San Joaquin County General Plan 2010, Section II - Community Development & Section IV – Resources | Regulates transmission lines; Puts limits on development of agricultural soils | San Joaquin County Community Development Department | 5.11.5.3.1 |
| Title 9 - Development Title of San Joaquin County | Provides requirements for alteration of land within county | San Joaquin County Community Development Department | 5.11.5.3.1 |
| Improvement Standards for San Joaquin County | Provides design standards for improvements within County | San Joaquin County Department of Public Works | 5.11.5.3.1 |
| San Joaquin County Standard Specifications and Special Provisions | Provides the County's minimum requirements for excavation safety, dust control, earthwork, and erosion and pollution control, and more. | San Joaquin County Department of Public Works | 5.11.5.3.1 |
| San Joaquin County Stormwater Management Plan | Regulates BMPs for construction activities | San Joaquin County Department of Public Works | 5.11.5.3.1 |
| Lodi Municipal Code – Title 17 | Regulates and provides requirements for development of land within the City limits. | City of Lodi Community Development Department | 5.11.5.3.2 |

### 5.11.5.1 Federal LORS

#### 5.11.5.1.1 Federal Water Pollution Control Act of 1972 (Clean Water Act)

The Federal Water Pollution Control Act of 1972, commonly referred to as the Clean Water Act (CWA) effectively prohibits discharges of pollutants to a water of the U.S. unless authorized under an NPDES permit. The 1987 CWA amendments established a framework for regulating municipal and industrial stormwater discharges under the NPDES program. In 1990, EPA published final regulations that established stormwater permit requirements for specific industrial categories, including construction. The State Water Resources Control Board (SWRCB) is the NPDES permitting authority in California and has adopted a statewide general permit for stormwater discharges associated with construction activity (General Construction Permit; SWRCB, 1999) that applies to projects resulting in one or more acres of soil disturbance. The General Construction Permit is currently under revision, and the revised permit is expected to be approved the SWRCB in 2008. LEC will result in disturbance of more than one acre of soil; therefore, the project will require coverage under the General Construction Permit, along with development and implementation of a site-specific SWPPP, which identifies BMPs that are adequate to control erosion and sediment transport from the site. The requirements are described in greater detail in Section 5.15, Water Resources.

#### 5.11.5.1.2 U.S. Department of Agriculture Engineering Standards

Sections 2 and 3 of the USDA-NRCS National Engineering Handbook (1983) provide standards for soil conservation during planning, design, and construction activities. The proposed LEC will need to conform to these standards during grading and construction to limit soil erosion.

### 5.11.5.2 State LORS

#### 5.11.5.2.1 California Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act (California Water Code, Division 7) is the state law governing water quality in California, and designates responsibilities to the State Water Resources Control Board (SWRCB) and nine Regional Water Quality Control Boards (RWQCB) to coordinate and control water quality. As described above, in 1999, the SWRCB adopted a general NPDES permit, in compliance with the CWA, to regulate stormwater discharges from construction sites greater than 1 acre in size. The LEC lies within the jurisdiction of the Central Valley Regional Water Quality Control Board; this RWQCB would ensure that the project complies with General Construction Permit requirements.

### 5.11.5.3 Local LORS

#### 5.11.5.3.1 San Joaquin County

Applicable San Joaquin County regulations include the General Plan 2010 (San Joaquin County, 1992), the Development Title (LexisNexis Municipal Codes, 1995), the Improvement Standards (San Joaquin County Department of Public Works, 1997), as well as the Standard Specifications and Special Provisions document (San Joaquin County Department of Public Works, 2008).

Sections of the General Plan that may be relevant to this project include Resources (Section IV), and Community Development (Section II). Policies regarding soil conservation are found in the Agricultural Lands Section of the Resources portion of the plan. Policies

regarding transmission lines are found in the Utilities Section of the Community Development portion of the plan.

The Development Title for the County describes the requirements for land alteration within the county. Several of the Development Title divisions that may apply to this project include Division 6 (Agricultural Zones), Division 14 (Grading and Excavation Regulations), and Division 15 (Natural Resources Regulations). Division 18 (Williamson Act Regulations) do not apply as the property is already developed for non-agricultural uses and any off-site impacts (such as a laydown area) would be temporary.

The county Improvement Standards document describes design standards for roads, storm drains, water systems, sewer systems, and fire access that would apply to construction on the site. The San Joaquin County Standard Specifications and Special Provisions document provides the County's minimum requirements for excavation safety, dust control, earthwork, watering, erosion control and pollution control. LEC compliance with the requirements of these regulations will be accomplished through the public project review process and by local review for grading and excavation permits.

Additionally, the county developed a Storm Water Management Plan (San Joaquin County, 2003), in compliance with Phase II Municipal Separate Storm Sewer (MS4) permit requirements, that describes actions that will be taken by the county to ensure construction activities within the county implement effective BMPs to control erosion and sedimentation.

#### 5.11.5.3.2 City of Lodi

Prior to construction of the proposed site, a site preparation grading permit is required in accordance with Lodi Municipal Code – Title 17. The code includes information for application filling and processing (Chapter 17.50), permit approval (Chapter 17.52), and permit implementation, time limits, and extensions (Chapter 17.54). The applicable codes and permit package are provided at the City of Lodi website (www.lodi.gov) on the Community Development Page.

In addition to the permit fee, a habitat fee will be attached to the grading permit (Chadwick, 2008). The habitat fee, depends on the site location and acreage, and allows for an initial site assessment of the site by a biologist or land surveyor prior to permit approval. BMPs are required to be implemented to prevent, control, and reduce stormwater pollution for all construction within the City limits. At this time there are no formal permits associated with BMPs because they are built into City construction and land development permit reviews. The proposed LEC will conform to City requirements by preparing and submitting an application for the site preparation grading permit.

## 5.11.6 Agencies and Agency Contacts

Permits required for the LEC along with agency contacts are shown in Table 5.11-6. A grading permit application and permit approval will be obtained from San Joaquin County and from the City of Lodi before construction begins. Other permits will be obtained from the county if design plans warrant. Coverage under the General Construction Permit will need to be obtained prior to any construction disturbance on the site.

TABLE 5.11-6
Permits and Agency Contacts for Soils

| Permit or Approval | Agency Contact | Applicability |
|---|---|---|
| Grading Permit Application & Permit | Dennis Canright, Building Official<br>City of Lodi Community Development Department, Building Division<br>221 West Pine Street<br>P.O. Box 3006<br>Lodi, California 95241-1910<br>209-333-6714<br>Email: dcanright@lodi.gov | Grading of site surfaces |
| General Construction Permit | Jim Marshall, Senior Engineer<br>San Joaquin Delta Unit,<br>Central Valley RWQCB<br>11020 Sun Center Drive #200<br>Rancho Cordova, CA 95670<br>(916) 464-4772 | Regulation of stormwater discharge from site facilities during construction |
| Site Preparation Grading Permit | Dennis Canright, Building Official<br>City of Lodi<br>Community Development Department<br>221 West Pine Street<br>PO Box 3006<br>Lodi, CA 95670<br>Office: (209) 333-6711<br>Fax: (209) 333-6842<br>Email: dcanright@lodi.gov | Permit forms, applications, and guidelines |

## 5.11.7 Permits and Permit Schedule

It is expected that all the required permits for grading and stormwater discharge can be secured as long as applications are provided to the appropriate agency a maximum of 6 months prior to construction.

## 5.11.8 References

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