Appendix 5.11A
Soil Loss Estimates

Table 5.11-3. Estimate of Soil Loss by Water Erosion Using Revised Universal Soil Loss Equation (RUSLE2)

Table 5.11-2. Estimate of Soil Loss by Water Erosion Using Revised Universal Soil Loss Equation (RUSLE2)

Feature (acreage)[2]	Activity	Duration (months)	Estimates Using Revised Universal Soil Loss Equation[1]		
			Soil Loss (tons) without BMPs	Soil Loss (tons) with BMPs	Soil Loss (tons/yr) No Project
Site (1410 acres)	Grading	6	73.3	0.5640	21.432
	Construction	27	126.9	2.5380	---
Offsite Laydown Area	Grading	2	1.3	0.0000	1.159
	Construction	27	0.0	0.0000	---
Transmission Line (66.9 acre construction corridor; 0.04 acre for pole footprints)	Grading	2	1.45	0.0074	1.27094
	Construction	10	1.86	0.0372	---
Drainage Swale (25 acres, extends around perimeter fence - 40 feet to the outside)	Grading	2	0.5	0.0042	0.48
	Construction	31	3.2	0.0646	
Project Soil Loss Estimates	**Construction Period**	**33**	**208.62**	**3.22**	**24.34**

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 Rositas fine sand, 0-2 percent slope, from Imperial County soil database
   -Soil loss (R-factors) were estimated using 2-year, 6-hour point precipitation frequency amount for the RSEP project site found at [http://www.nws.noaa.gov/ohd/hdsc/noaaatlas2.htm].
   -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. Acreages assume a 50 ft corridor for the transmission line and an additional 50x100 ft construction area for tower installation.
The transmission line pole holes each have a 4 ft by 4 ft excavation footprint.

Other Project Assumptions as follows:
-It is assumed that 100% of the RSEP project site will be graded; the site will be 80% bare soil during construction.
-It is assumed that grading the project site will take 2 months and construction will take an additional 27 months
-The overhead transmission line poles will have 4-foot x 4-foot footprints.
-It is assumed that the grading/excavation for the pole holes will be completed within 2 months and the entire installation will be completed within 12 months.

RUSLE2 Assumptions as follows:
150-ft slope length. Estimated soil unit slope is the maximum of the estimated slope class.
Construction w/o BMP soil losses assume the following inputs: Management - Construction Site Template/Default; Strips/Barriers=None; Contouring: Rows up-and-down hill; Diversion/Terrace, Sediment basin = None
Grading soil losses assume the following inputs: Management - Bare ground/rough surface; Contouring - None, rows up and down hill; Diversion/terracing - None; Strips and Barriers - None.
Construction with BMP soil losses assume the following inputs: Management - Construction Site Template/Default; Contouring - Perfect, no row grade; Strips/Barriers: 1 silt fence in middle of slope; Diversion/Terrace: 1 Detention Basin at end of slope
No Project soil losses assume the following inputs: Management - Multi-Year Rotation Template/Shrub-Warm Season Grass Rangeland; Contouring - None, rows up and down hill; Diversion/terracing - None; Strips and Barriers - None.

Soil Type	Acreage		Soil Loss Estimates Using RUSLE2 software (tons/ac/year)			
		Slope	Grading	Construction w/o BMPs	Construction with BMPs	No Project
Project Site						
Rositas* (132 from Imperial County soils database)	1128.00	2	0.13	0.05	0.001	0.019
	1128.00	**Subtotal (tons)**	**146.6400**	**56.4000**	**1.1280**	**21.4320**
Offsite Laydown Area/Offices/Parking/Heliostat Fabrication						
Rositas (132 from Imperial County soils database)	61.00	2	0.13	0.05	0.0010	0.019
	0.00	**Subtotal (tons)**	**7.9300**	**0.0000**	**0.0000**	**1.1590**
Perimeter Swale						
Rositas (132 from Imperial County soils database)	**25.00**	2	0.13	0.05	0.0010	0.019
	25.00	**Subtotal (tons)**	**3.2500**	**1.2500**	**0.0250**	**0.4750**
Transmission Line (includes 0.5 acre laydown area)						
Rositas (132 from Imperial County soils database)	66.8916	2	0.13	0.05	0.001	0.019
	44.61	**Subtotal (tons)**	**8.6959**	**2.2303**	**0.0446**	**1.2709**
		Subtotal (tons)	**166.52**	**59.88**	**1.20**	**24.34**

Assumptions:
Assumes slope is the high range of the slope class
Assumes grading on 100% of entire project site; 80% of the project site will be bare soil during constructior
Assumes 100% of offsite laydown area/offices/parking/helopstat fabrication area will be covered by gravel during constructior
Assumes 80% of the transmission line corridor will be unprotected during construction
100% of pole holes will be bare soil during grading/excavation.

Transmission pole impact area assumes a 4 ft by 4 ft footprint times the number of poles. One pole is estimated for every 500 feet of t-line. T-line is
The No Project soil loss assumes a 'Multi-Year Rotation Template/Shrub-Warm Season Rangeland' management scenario.

*Because soils have not been mapped for the project area, Rositas fine sand, 0-2 percent slope (map unit 132) from the Imperial County soils datab
as a proxy. It is assumed that soil characteristics at the project site would be similar to Rositas soils.

Table 5.11-4. Estimate of Total Suspended Particulates (TSP) Emitted from Grading and Wind Erosion

Table 5.11-3. Estimate of Total Suspended Particulates (TSP) Emitted from Grading and Wind Erosion				
Emission Source	**Acreage**	**Duration (months)**	**Unmitigated TSP (tons)**	**Mitigated TSP (tons)**
Grading Dust:				
Project Site	1410.00	6	145.406	50.892
Project Site Laydown Area	61.00	2	2.097	0.734
Transmission Line Pole Holes	0.0356	2	0.0012	0.0004
Transmission Line Laydown Area	0.50	0	0.000	0.000
Drainage Swale	25.00	2	0.859	0.301
Wind Blown Dust:				
Project Site	1128.00	27	964.440	337.554
Project Site Laydown Area	61.00	27	0.000	0.000
Transmission Line Corridor	44.61	10	14.12525	4.94384
Transmission Line Laydown Area	0.50	0	0.000	0.000
Drainage Swale	25.00	31	24.542	8.590
Estimated Total		**33**	**1151.471**	**403.015**

Project Assumptions:

Grading for project site will be completed in a 6 month period and construction will extend an additional 27 months.

Approximately 80 percent of the project site will have bare soil exposure during the length of the construction period.

It is assumed that the t-line construction laydown area will not be graded. It is expected that all roadway and laydown areas would be covered (gravelled or paved) for all season use.

Excavation of transmission line pole holes will take 2 month followed by a 10 month construction period.

The transmission poles will have a 4 by 4 foot area.

The 50 ft t-line construction corridors will remain in natural vegetation, with approximately 80% bare soil exposed.

Data Sources:

[a] PM10 Emission Factor Source: Midwest Research Institute, South Coast AQMD Project No. 95040, Level 2 Analysis Procedure, March 1996

[b] PM10 to TSP Conversion Factor Source: Bay Area Air Quality Management District CEQA Guidelines, Assessing the Air Quality Impacts of Projects, December 1999.

SCAQMD CEQA Handbook (1993) Table 11-4 for mitigation efficiency rates (as summarized in Table 8.9-4)

Project: Contra Costa Generating Station

Dust from Wind Erosion - With and Without Mitigation

Grading		MRI factor of 0.011 tons/acre/month is based on 168 hours per month of construction activity.
PM10 Emission Factor (ton/acre/month)[a]	0.011	Fact Sheet, 4/26/2007.
Project Site		
Duration (months):	6	Assumes 6 months of active grading
Site Acreage:	1410.00	Assumes 100% of site is graded
PM10 Emitted (tons):	93.06	
TSP Emitted (tons)[b]:	**145.406**	assume TSP is 64% PM10
Mitigated TSP Emitted (tons):	**50.892**	Assume 65% reduction in PM10 with watering thrice daily per SCAQMD CEQA Handbook (1993) Table 11-4
Project Site Laydown Area		
Duration (months):	2	Assumes 2 months of active grading
Site Acreage:	61.00	Assumes 100% of project site laydown area will be graded
PM10 Emitted (tons):	1.34	
TSP Emitted (tons)[b]:	**2.097**	assume TSP is 64% PM10
Mitigated TSP Emitted (tons):	**0.734**	Assume 65% reduction in PM10 with watering thrice daily per SCAQMD CEQA Handbook (1993) Table 11-4
Transmission Line Pole Holes		
Duration (months):	2	Assumes 2 months of active grading
Site Acreage:	0.0356	Assumes grading occurs in 4 x 4 ft area for each pole
PM10 Emitted (tons):	0.0008	
TSP Emitted (tons)[b]:	**0.0012**	assume TSP is 64% PM10
Mitigated TSP Emitted (tons):	**0.0004**	Assume 65% reduction in PM10 with watering thrice daily per SCAQMD CEQA Handbook (1993) Table 11-4
Transmission Line Laydown Area		
Duration (months):	0	Assumes transmission line laydown area WILL NOT be graded.
Site Acreage:	0.50	
PM10 Emitted (tons):	0.00	
TSP Emitted (tons)[b]:	**0.000**	assume TSP is 64% PM10
Mitigated TSP Emitted (tons):	**0.000**	Assume 65% reduction in PM10 with watering thrice daily per SCAQMD CEQA Handbook (1993) Table 11-4
Drainage Swale		
Duration (months):	2	Assumes 2 months of active grading
Site Acreage:	25.00	Assumes 100% of drainage swale will be graded
PM10 Emitted (tons):	0.5500	
TSP Emitted (tons)[b]:	**0.859**	assume TSP is 64% PM10
Mitigated TSP Emitted (tons):	**0.301**	Assume 65% reduction in PM10 with watering thrice daily per SCAQMD CEQA Handbook (1993) Table 11-4
Total Unmitigated TSP Emitted (tons):	**148.364**	
Total Mitigated TSP Emitted (tons):	**51.927**	Assume 65% reduction in PM10 with watering thrice daily per SCAQMD CEQA Handbook (1993) Table 11-4

[a]Emission Factor Source: Midwest Research Institute, South Coast AQMD Project No. 95040, March 1996, Level 2 Analysis Procedure

[b] Conversion Factor Source: Bay Area Air Quality Management District (BAAQMD) BAAQMD CEQA Guidelines, Assessing the Air Quality Impacts of Projects and Plans. December 1999

Wind Blown Dust		
TSP Emission Factor (ton/acre/year)	0.38	Emission Factor Source: AP-42, Section 11.9 Western Surface Coal Mining Table 11.9-4, January 1995.
Project Site		
Acres exposed	1128.00	Assumes that 80% of the project area is exposed during construction
Duration (months)	27	Assumes 27 months of construction after grading
TSP Emitted for Site (tons):	**964.440**	
Mitigated TSP Emitted (tons):	**337.554**	Assume 65% reduction in TSP with watering thrice daily per SCAQMD CEQA Handbook (1993) Table 11-4
Project Site Laydown Area		
Acres exposed	0.0	Assumes project site laydown area is completely covered (natural veg, gravelled or paved) during construction
Duration (months)	27	Assumes 27 months of construction traffic
TSP Emitted for Site (tons):	**0.000**	
Mitigated TSP Emitted (tons):	**0.000**	Assume 65% reduction in TSP with watering thrice daily per SCAQMD CEQA Handbook (1993) Table 11-4
Transmission Line Corridor		
Acres exposed	44.6061	Assumes 80% of the corridor is unprotected during construction
Duration (months)	10	Assumes 10 months of excavation & installation
TSP Emitted for Site (tons):	**14.12525**	
Mitigated TSP Emitted (tons):	**4.943838**	Assume 65% reduction in TSP with watering thrice daily per SCAQMD CEQA Handbook (1993) Table 11-4
Transmission Line Laydown Area		
Acres exposed	0.000	Assumes transmission line laydown area is completely covered (natural veg, gravelled or paved) during construction
Duration (months):		
TSP Emitted (tons)[b]:	**0.000**	
Mitigated TSP Emitted (tons):	**0.000**	Assume 65% reduction in TSP with watering thrice daily per SCAQMD CEQA Handbook (1993) Table 11-4
Drainage Swale		
Acres exposed	25.000	Assumes 100% exposed during construction
Duration (months):	31	Assumes 31 months of construction
TSP Emitted (tons)[b]:	**24.542**	
Mitigated TSP Emitted (tons):	**8.590**	Assume 65% reduction in TSP with watering thrice daily per SCAQMD CEQA Handbook (1993) Table 11-4
Total Wind Blown Dust (tons) without mitig	**1003.107**	
Total WBD (tons) with mitigation	**351.087**	Assume 65% reduction in PM10 with watering thrice daily per SCAQMD CEQA Handbook (1993) Table 11-4
Project total without mitigation	**1151.471**	
Project total with mitigation	**403.015**	