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APPENDIX 8.1A

Construction Phase Impacts

8.1A.0 CONSTRUCTION PHASE IMPACTS

8.1A.1 Onsite Construction

Construction of the CPP project will occur in two separate phases. The first phase of construction will last approximately 24 months and will include the site preparation for the four gas turbines/HRSGs. In addition, Phase I construction will include the installation of two gas turbines/HRSGs, a cooling tower, and the linears for the project. Phase II of the construction will begin after the first two gas turbine/HRSGs are installed. This phase of construction will include the installation of the second two gas turbines/HRSGs and the second cooling tower. This phase of construction will last approximately 18 months. The onsite construction will occur in the following five main phases:

- Site preparation;
- Foundation work;
- Installation of major equipment;
- Construction/installation of major structures; and
- Start up and commissioning.

Site preparation includes clearing, grading, excavation of footings and foundations, and backfilling operations. After site preparation is finished, the construction of the foundations and structures is expected to begin. Once the foundations and structures are finished, installation and assembly of the mechanical and electrical equipment are scheduled to commence.

Fugitive dust emissions from the construction of the CPP project will result from:

- Dust entrained during site preparation and grading/excavation at the construction site;
- Dust entrained during onsite travel on paved and unpaved surfaces;
- Dust entrained during aggregate and soil loading and unloading operations; and
- Wind erosion of areas disturbed during construction activities.

Combustion emissions during construction will result from:

- Exhaust from the diesel construction equipment used for site preparation, grading, excavation, and construction of onsite structures;
- Exhaust from water trucks used to control construction dust emissions;
- Exhaust from diesel-powered welding machines, electric generators, air compressors, water pumps, etc.;
- Exhaust from diesel trucks used to deliver concrete, fuel, and construction supplies to the construction site; and
- Exhaust from automobiles and trucks used by workers to commute to the construction site.

To determine the potential worst-case daily construction impacts, exhaust and dust emission rates have been evaluated for each source of emissions. Worst-case daily exhaust and dust emissions are expected to occur during month ten of the construction schedule. Annual emissions are based on the average equipment mix during the 24-month construction period.

8.1A.2 Pipelines and Transmission Lines

The installation of a Phase I 26-mile long natural gas pipeline will generate short-term construction impacts including fugitive dust and construction equipment combustion emissions. For this

pipeline route, the excavation, installation of pipe, backfilling, and site cleanup will be performed in approximately 500-foot-long sections over a short duration to minimize fugitive dust and construction equipment combustion emissions. After the first phase of construction is complete and the first gas turbines/HRSGs are installed, the construction of a second Phase II natural gas pipeline will occur. The Phase II natural gas pipeline will be approximately 10 to 12 miles long. Since the Phase II natural gas pipeline is shorter than the Phase I natural gas pipeline, the emission impacts associated with the construction of the Phase II pipeline are expected to be less than the impacts associated with the construction of the Phase I pipeline.

The installation of a 0.3-mile long water supply pipeline and a 0.2-mile long wastewater pipeline will also generate short-term construction impacts including fugitive dust and construction equipment combustion emissions.

The proposed project also includes the installation of a 0.4-mile long transmission line interconnect. As with the construction of the pipelines, this construction activity will result in fugitive dust and construction equipment combustion emissions.

8.1A.3 Available Mitigation Measures

The following mitigation measures are proposed to control exhaust emissions from the diesel heavy equipment used during construction of the CPP project:

- Operational measures, such as limiting engine idling time and shutting down equipment when not in use;
- Regular preventive maintenance to prevent emission increases due to engine problems;
- Use of low sulfur and low aromatic fuel meeting California standards for motor vehicle diesel fuel; and
- Use of low-emitting diesel engines meeting federal emissions standards for construction equipment if available.

The following mitigation measures are proposed to control fugitive dust emissions during construction of the project:

- Use either water application or chemical dust suppressant application to control dust emissions from unpaved surface travel and unpaved parking areas;
- Use vacuum sweeping and/or water flushing of paved road surface to remove buildup of loose material to control dust emissions from travel on the paved access road (including adjacent public streets impacted by construction activities) and paved parking areas;
- Cover all trucks hauling soil, sand, and other loose materials, or require all trucks to maintain at least two feet of freeboard;
- Limit traffic speeds on unpaved surfaces to 25 mph;
- Install sandbags or other erosion control measures to prevent silt runoff to roadways;
- Re-plant vegetation in disturbed areas as quickly as possible;
- As needed, use gravel pads along with wheel washers or wash tires of all trucks exiting construction site that carry track-out dirt from unpaved surfaces; and
- Mitigate fugitive dust emissions from wind erosion of areas disturbed from construction activities (including storage piles) by application of either water or chemical dust suppressant and/or use of wind breaks.

8.1A.4 Estimation of Emissions with Mitigation Measures

8.1A.4.1 Onsite Construction (Phase I)

Tables 8.1A-1 and 8.1A-2 show the estimated maximum daily and annual heavy equipment exhaust and fugitive dust emissions with recommended mitigation measures for onsite construction activities during Phase I of construction. Because much of the site preparation for the second two gas turbines/HRSG will be done during the Phase I construction activities, the amount of construction equipment and the construction time for Phase II are less than for Phase I. Consequently, the emissions levels during Phase II are expected to be less than during Phase I construction. Detailed emission calculations for Phase I construction are included as Attachment 8.1A.1.

8.1A.4.2 Pipeline/Transmission Line Construction

Table 8.1A-3 shows the estimated maximum daily heavy equipment exhaust and fugitive dust emissions with recommended mitigation measures for the pipelines and transmission line interconnect construction activities. The following is the expected construction period for each pipeline/transmission line route:

- Phase I - Natural gas pipeline – 9 to 10 months
- Water supply pipeline – 2 to 3 months
- Wastewater pipeline – 1 to 2 months
- Transmission line interconnect – 2 to 3 months

Because of the temporary nature of these construction activities, annual emissions are not shown in the following emission summary tables for these construction activities. Detailed emission calculations are included as Attachment 8.1A.1.

TABLE 8.1A-1
Maximum Daily Emissions During Phase I Onsite Construction, Pounds Per Day

	NO_x	CO	VOC	SO_x	PM_{10}
Onsite					
Construction Equipment	129.7	35.4	10.0	3.63	6.4
Fugitive Dust	--	--	--	--	39.8
Offsite					
Worker Travel, Truck Deliveries	176.79	1,430.17	116.61	2.57	3.5
Total Emissions					
Total	306.5	1,465.6	126.6	6.2	49.6

TABLE 8.1A-2
Annual Emissions During Phase I Onsite Construction, Tons Per Year

	NO_x	CO	VOC	SO_x	PM_{10}
Onsite					
Construction Equipment	11.1	3.34	0.9	0.32	0.7
Fugitive Dust	--	--	--	--	3.3
Offsite					
Worker Travel, Truck Deliveries	13.27	104.19	8.51	0.20	0.44
Total Emissions					
Total	24.3	107.5	9.4	0.5	4.4

TABLE 8.1A-3
Maximum Daily Emissions During Pipeline/Transmission Line Interconnect Construction
Pounds Per Day

	NO_x	CO	VOC	SO_x	PM_{10}
Phase I - Natural Gas Pipeline					
Onsite					
Construction Equipment	70.1	18.0	4.8	2.2	3.3
Fugitive Dust	--	--	--	--	13.7
Offsite					
Truck Deliveries and Worker Travel	18.6	11.6	1.7	0.8	1.0
Total Emissions	86.7	29.6	6.5	3.0	18.0
Water Supply Pipeline					
Onsite					
Construction Equipment	56.5	19.1	4.3	2.0	2.8
Fugitive Dust	--	--	--	--	8.1
Offsite					
Truck Deliveries and Worker Travel	27.8	17.4	2.5	1.2	1.6
Total Emissions	84.3	36.5	6.8	3.2	12.5
Transmission Line Interconnect					
Onsite					
Construction Equipment	55.7	11.7	3.6	1.6	2.5
Fugitive Dust	--	--	--	--	1.1
Offsite					
Truck Deliveries and Worker Travel	46.4	29.0	4.2	1.9	2.6
Total Emissions	102.1	40.7	7.8	3.5	6.2
Wastewater Pipeline					
Onsite					
Construction Equipment	49.6	18.1	3.9	1.8	2.5
Fugitive Dust	--	--	--	--	5.4
Offsite					
Truck Deliveries and Worker Travel	27.8	17.4	2.5	1.2	1.6
Total Emissions	77.4	35.5	6.4	3.0	9.5

8.1A.5 Analysis of Ambient Impacts from Phase I Onsite Construction

Ambient air quality impacts from emissions during Phase I construction of the CPP project were estimated using an air quality dispersion modeling analysis. The modeling analysis considers the construction site location, the surrounding topography, and the sources of emissions during construction, including vehicle and equipment exhaust emissions and fugitive dust. As discussed above, because the emission levels during Phase II construction are expected to be less than the levels during Phase I, the ambient air quality impacts during Phase II are also expected to be less than Phase I impacts.

8.1A.5.1 Existing Ambient Levels

The existing air quality in the project area is based on the same data used for the modeling analysis performed for the project operating impacts (see Section 6.2.5.1.2). Table 8.1A-4 shows the maximum concentrations of NO_x, SO_2, CO, and PM_{10} recorded in the project area over the past few years.

TABLE 8.1A-4
Maximum Background Concentrations, 1998-2000 (µg/m^3)

Pollutant	Averaging Time	1998	1999	2000
NO_2	1-Hour	90.2	152.3	95.9
	Annual	16.9	20.7	18.8
SO_2	1-Hour	78.6	78.6	--
	24-Hour	47.2	36.7	21.0
	Annual	7.9	10.5	13.1
CO	1-Hour	9,200	9,200	--
	8-Hour	8,165	6,589	5,095
PM_{10}	24-Hour	79	88	86
	Annual (AAM)[a]	23.6	25.1	22.8
	Annual (AGM)[b]	19.8	21.3	20.2

8.1A.5.2 Dispersion Model

As in the analysis of project operating impacts, the EPA-approved Industrial Source Complex Short Term (ISCST3) model was used to estimate ambient impacts from construction activities. A detailed discussion of the ISCST3 dispersion model is included in Section 8.1.5.2.2.

The emission sources for the construction site were grouped into two categories: exhaust emissions and dust emissions. The SCREEN3 model was used with typical Diesel exhaust characteristics to model final plume rise under worst-case meteorological conditions. Using this approach, the lowest final plume rise (which limits dispersion and leads to the highest ground-level concentrations) was determined to be 4.6 meters, and this elevation was used as the release height for all exhaust emissions in this modeling analysis. For construction dust emissions, an effective plume height of 2.0 meters was used in the modeling analysis. The exhaust and dust emissions were modeled as a single area source that covered the total area of the construction site. The construction impacts modeling analysis used the same receptor locations as used for the project operating impact analysis. A detailed discussion of the receptor locations is included in Section 8.1.5.2.2.

To determine the construction impacts on short-term ambient standards (24 hours and less), the worst-case daily onsite construction emission levels shown in Table 8.1A-1 were used. For pollutants with annual average ambient standards, the annual onsite emission levels shown in Table 8.1A-2 were used. The same meteorological data set used for the project operating modeling analysis was used for the construction emission impacts analysis.

8.1A.5.3 Modeling Results

Based on the emission rates of NO_x, SO_2, CO, and PM_{10} and the meteorological data, the ISCST3 model calculates hourly and annual ambient impacts for each pollutant. As mentioned above, the modeled 1-hour, 3-hour, 8-hour, and 24-hour ambient impacts are based on the worst-case daily emission rates of NO_x, SO_2, CO, and PM_{10}. The annual impacts are based on the annual emission rates of these pollutants.

The one-hour and annual average concentrations of NO_2 were computed following the revised EPA guidance for computing these concentrations (August 9, 1995 *Federal Register,* 60 FR 40465). The highest monitored ambient one-hour average ozone level monitored at the nearby Sloughhouse monitoring station, 0.149 ppm, was used to correct the one-hour average NOx concentration to NO_2. This method results in a conservatively high estimate of NO_2 conversion. The use of concurrent hourly ozone data for ozone limiting would be expected to produce a less conservative ozone-corrected NO_2 concentration; thus, the maximum hourly NO_2 concentration is expected to be lower than the value shown below. The annual average was calculated using the ambient ratio method (ARM) with the EPA default value of 0.75 for the annual average NO_2/NO_x ratio.

The modeling analysis results are shown in Table 8.1A-5. Also included in the table are the maximum background levels that have occurred during the past few years and the resulting total ambient impacts. As shown in Table 8.1A-5, with the exception of 24-hour average PM10, construction impacts alone for all modeled pollutants are expected to be below the most stringent state and national standards. With the exception of 24-hour PM_{10} and one-hour average NO_2 impacts, construction activities are not expected to cause the violation of any state or federal ambient air quality standard. However, the state 24-hour average PM_{10} standard is exceeded in the absence of the construction emissions for the CPP project, and the one-hour NO_2 concentration is conservatively overpredicted, as discussed above.

TABLE 8.1A-5
Modeled Maximum Construction Impacts

Pollutant	Averaging Time	Maximum Construction Impacts ($\mu g/m^3$)	Background ($\mu g/m^3$)	Total Impact ($\mu g/m^3$)	State Standard ($\mu g/m^3$)	Federal Standard ($\mu g/m^3$)
NO_2[a]	1-Hour	403.7	152.3	556.0	470	--
	Annual	4.3	20.7	25.0	--	100
SO_2	1-Hour	34.6	78.6	113.2	650	--
	24-Hour	8.8	47.2	56.0	109	365
	Annual	0.2	13.1	13.3	--	80
CO	1-Hour	337.7	9,200	9,538	23,000	40,000
	8-Hour	256.1	8,165	8,421	10,000	10,000
PM_{10}	24-Hour	156.2	88	244.2	50	150
	Annual[b]	5.5	21.3	26.8	30	--
	Annual[c]	5.5	25.1	30.6	--	50

Notes: a. OLM used for 1-hr average impact and ARM applied for annual average, using EPA default ratio of 0.75.
b. Annual Geometric Mean.
c. Annual Arithmetic Mean.

It is important to note that about 90% (141 out of 156 ug/m3) of the maximum modeled 24-hour PM_{10} concentrations from construction activities are due to fugitive dust from construction activities rather than to exhaust from construction equipment. The impact from construction exhaust is only about 15 ug/m^3. Therefore, additional controls on construction equipment engines will be only marginally effective in minimizing PM_{10} impacts during construction. The emphasis should be on control of fugitive dust, and the dust mitigation measures already proposed by the applicant are expected to be very effective in minimizing fugitive dust emissions.

The ISCST3 model over-predicts PM_{10} construction emission impacts because of the cold plume (i.e., ambient temperature) effect of dust emissions. Most of the plume dispersion characteristics in the ISCST3 model are derived from observations of hot plumes associated with typical smokestacks. The ISCST3 model does compensate for plume temperature; however, for ambient temperature plumes, the model assumes negligible buoyancy and dispersion. Consequently, the ambient concentrations in cold plumes remain high even at significant distances from a source. The CPP project construction site impacts are not unusual in comparison to most construction sites; construction sites that use good dust suppression techniques and low-emitting vehicles typically do not cause violations of air quality standards. The input and output modeling files are being provided electronically.

8.1A.5.4 Health Risk of Diesel Exhaust

The combustion portion of annual PM_{10} emissions from Table 8.1A-2 above were modeled separately to determine the annual average Diesel PM_{10} exhaust concentration. This was used with the ARB-approved unit risk value of 300 in one million for a 70-year lifetime to determine the potential carcinogenic risk from Diesel exhaust during construction. The exposure was also adjusted by a factor of 2/70, or 0.0286, to correct for the 24-month exposure during the construction period.

The maximum modeled annual average concentration of Diesel exhaust PM_{10} is 0.36 ug/m^3. Using the unit risk value and adjustment factors described above, the carcinogenic risk due to exposure to

Diesel exhaust during construction activities is expected to be approximately 3.1 in one million. This is above the 1 in one million level considered to be significant under the Sacramento Metropolitan AQMD's CEQA guidelines. However, this impact will be extremely localized and is expected to be significantly lower at the nearest residences, which are approximately one mile away. The area in which the risk may exceed 1 in one million extends only about 150 meters to the north, east and southeast of the facility fenceline, as shown in Figure 8.1A-1.

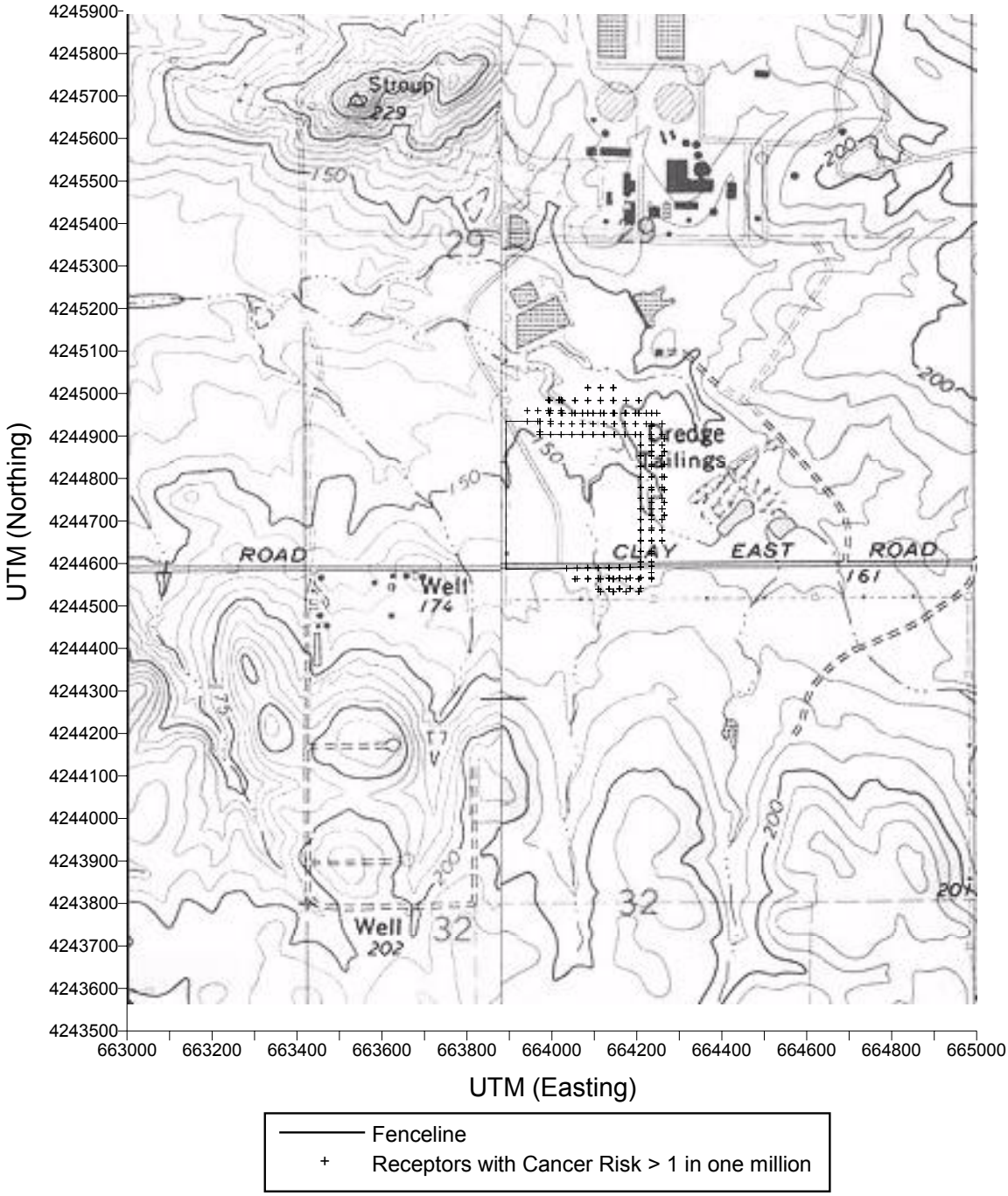
This analysis is overly conservative for several reasons. First, as discussed above, the modeled PM_{10} concentrations from construction operations are overpredicted by the ISCST3 model. Second, this analysis assumes that all the combustion PM_{10} is emitted by Diesel engines, when in fact some of the engines will be gasoline-fueled and thus will not produce Diesel particulates.

8.1A.5.5 Analysis of Ambient Impacts from Pipeline/Transmission Line Interconnect Construction

Construction of the natural gas/water pipelines and the transmission line interconnect activities will be of short duration, will require minimal equipment, and will generally occur along public roads and utility right-of-ways covering a large geographical area. Therefore, the potential ambient air quality impacts associated with these construction projects are expected to be minimal.

Figure 8.1A-1

Locations Where Modeled Cancer Risk During Construction Exceeds One in One Million



ATTACHMENT 8.1A-1

DETAILED CONSTRUCTION EMISSION CALCULATIONS

Phase I Construction Equipment Daily Exhaust Emissions (Month 5)

Equipment	Number of Units	Hrs/Day Per Unit	Gals/Hr Per Unit	Total Fuel Use (Gals/day)	Emission Factors (lbs/1000 gals)(1) NOx	CO	POC	SOx	PM10	Daily Emissions (lbs/day) NOx	CO	POC	SOx	PM10
Crawler Crane- Greater than 300 ton														
Crawler Crane- Greater than 200 ton														
Crane - Mobile 65 ton														
Cranes -Mobile 45 ton														
Cranes - Mobile 35 ton														
Bulldozer D6H	1	5.6	5.50	30.80	270.01	39.13	15.65	7.10	11.74	8.32	1.21	0.48	0.22	0.36
Bulldozer D4C	1	5.6	3.00	16.80	270.01	39.13	15.65	7.10	11.74	4.54	0.66	0.26	0.12	0.20
Excavator- Trencher														
Excavator- Earth Scraper	3	6.4	9.00	172.80	270.01	39.13	15.65	7.10	11.74	46.66	6.76	2.70	1.23	2.03
Excavator-Motor Grader	1	5.6	5.00	28.00	270.01	39.13	15.65	7.10	11.74	7.56	1.10	0.44	0.20	0.33
Excavator- Backhoe/loader														
Excavator - loader	1	5.6	2.50	14.00	270.01	39.13	15.65	7.10	11.74	3.78	0.55	0.22	0.10	0.16
Vibratory Roller	1	5.6	10.00	56.00	270.01	39.13	15.65	7.10	11.74	15.12	2.19	0.88	0.40	0.66
Portable Compaction roller														
Truck- Water	1	5.2	3.13	16.28	170.68	106.79	15.33	7.10	9.59	2.78	1.74	0.25	0.12	0.16
Forklift	1	5.2	2.50	13.00	270.01	39.13	15.65	7.10	11.74	3.51	0.51	0.20	0.09	0.15
Dump Truck	2	6.0	3.13	37.56	170.68	106.79	15.33	7.10	9.59	6.41	4.01	0.58	0.27	0.36
Service Truck- 1 ton														
Truck- Fuel/Lube	1	5.2	3.13	16.28	170.68	106.79	15.33	7.10	9.59	2.78	1.74	0.25	0.12	0.16
Concrete Pumper Truck														
Tractor Truck 5th Wheel														
Trucks- Pickup 3/4 ton	2	6.0	0.78	9.36	74.40	59.47	5.57	7.10	4.83	0.70	0.56	0.05	0.07	0.05
Trucks- 3 ton	1	5.6	1.56	8.74	74.40	59.47	5.57	7.10	4.83	0.65	0.52	0.05	0.06	0.04
Diesel Powered Welder														
Light Plants	2	4.0	1.27	10.16	313.05	195.66	46.96	7.10	39.13	3.18	1.99	0.48	0.07	0.40
Portable Compaction- Vibratory Plate														
Portable Compaction- Vibratory Ram														
Articulating Boom Platforms														
Pumps	3	4.0	1.27	15.24	313.05	195.66	46.96	7.10	39.13	4.77	2.98	0.72	0.11	0.60
Air Compressor 185 CFM	1	6.8	1.27	8.64	313.05	195.66	46.96	7.10	39.13	2.70	1.69	0.41	0.06	0.34
Air Compressor 750 CFM														
Concrete Vibrators														
Concrete Trowel Machine														
Fusion Welder														
Portable Power Generators	2	4.0	1.27	10.16	313.05	195.66	46.96	7.10	39.13	3.18	1.99	0.48	0.07	0.40
Total =										116.63	30.18	8.44	3.29	6.38

Construction Equipment Daily Exhaust Emissions (Month 15)

Equipment	Number of Units	Hrs/Day Per Unit	Gals/Hr Per Unit	Total Fuel Use (Gals/day)	Emission Factors (lbs/1000 gals)(1) NOx	CO	POC	SOx	PM10	Daily Emissions (lbs/day) NOx	CO	POC	SOx	PM10
Crawler Crane- Greater than 300 ton	1	6.4	7.50	48.00	270.01	39.13	15.65	7.10	11.74	12.96	1.88	0.75	0.34	0.56
Crawler Crane- Greater than 200 ton	3	6.0	5.00	90.00	270.01	39.13	15.65	7.10	11.74	24.30	3.52	1.41	0.64	1.06
Crane - Mobile 65 ton	2	5.6	4.00	44.80	270.01	39.13	15.65	7.10	11.74	12.10	1.75	0.70	0.32	0.53
Cranes - Mobile 45 ton	1	6.0	4.00	24.00	270.01	39.13	15.65	7.10	11.74	6.48	0.94	0.38	0.17	0.28
Cranes - Mobile 35 ton	2	6.0	4.00	48.00	270.01	39.13	15.65	7.10	11.74	12.96	1.88	0.75	0.34	0.56
Bulldozer D6H														
Bulldozer D4C														
Excavator- Trencher														
Excavator- Earth Scraper														
Excavator-Motor Grader														
Excavator- Backhoe/loader	1	6.0	2.50	15.00	270.01	39.13	15.65	7.10	11.74	4.05	0.59	0.23	0.11	0.18
Excavator - loader														
Vibratory Roller														
Portable Compaction roller	1	5.6	10.00	56.00	270.01	39.13	15.65	7.10	11.74	15.12	2.19	0.88	0.40	0.66
Truck- Water	1	5.2	3.13	16.28	170.68	106.79	15.33	7.10	9.59	2.78	1.74	0.25	0.12	0.16
Forklift	1	5.2	2.50	13.00	270.01	39.13	15.65	7.10	11.74	3.51	0.51	0.20	0.09	0.15
Dump Truck														
Service Truck- 1 ton	1	5.2	1.56	8.11	74.40	59.47	5.57	7.10	4.83	0.60	0.48	0.05	0.06	0.04
Truck- Fuel/Lube	1	5.2	3.13	16.28	170.68	106.79	15.33	7.10	9.59	2.78	1.74	0.25	0.12	0.16
Concrete Pumper Truck														
Tractor Truck 5th Wheel	1	5.6	3.13	17.53	270.01	39.13	15.65	7.10	11.74	4.73	0.69	0.27	0.12	0.21
Trucks- Pickup 3/4 ton	4	6.0	0.78	18.72	74.40	59.47	5.57	7.10	4.83	1.39	1.11	0.10	0.13	0.09
Trucks- 3 ton	2	5.6	1.56	17.47	74.40	59.47	5.57	7.10	4.83	1.30	1.04	0.10	0.12	0.08
Diesel Powered Welder	2	5.2	1.27	13.21	313.05	195.66	46.96	7.10	39.13	4.13	2.58	0.62	0.09	0.52
Light Plants														
Portable Compaction- Vibratory Plate	2	5.6	0.25	2.80	313.05	195.66	46.96	7.10	39.13	0.88	0.55	0.13	0.02	0.11
Portable Compaction- Vibratory Ram	2	5.6	0.25	2.80	313.05	195.66	46.96	7.10	39.13	0.88	0.55	0.13	0.02	0.11
Articulating Boom Platforms	5	6.4	0.25	8.00	313.05	195.66	46.96	7.10	39.13	2.50	1.57	0.38	0.06	0.31
Pumps	2	4.0	1.27	10.16	313.05	195.66	46.96	7.10	39.13	3.18	1.99	0.48	0.07	0.40
Air Compressor 185 CFM	1	6.8	1.27	8.64	313.05	195.66	46.96	7.10	39.13	2.70	1.69	0.41	0.06	0.34
Air Compressor 750 CFM	3	6.8	1.27	25.91	313.05	195.66	46.96	7.10	39.13	8.11	5.07	1.22	0.18	1.01
Concrete Vibrators	2	4.0	0.25	2.00	313.05	195.66	46.96	7.10	39.13	0.63	0.39	0.09	0.01	0.08
Concrete Trowel Machine														
Fusion Welder														
Portable Power Generators	1	4.0	1.27	5.08	313.05	195.66	46.96	7.10	39.13	1.59	0.99	0.24	0.04	0.20
Total =										129.67	35.43	10.01	3.63	7.78

Notes:
(1) See notes for combustion emissions.

Phase I Construction Equipment Annual Exhaust Emissions

Equipment	Average Number of Units Per Year(1)	Average Operating Hrs/Day Per Unit	Gals/Hr Per Unit	Average Operating Days per Year	Total Fuel Use (Gals/yr)	Emission Factors (lbs/1000 gals)(2)					Annual Emissions (tons/yr)				
						NOx	CO	POC	SOx	PM10	NOx	CO	POC	SOx	PM10
Crawler Crane- Greater than 300 ton	0.25	6.4	7.50	250	3,000	270.01	39.13	15.65	7.10	11.74	0.41	0.06	0.02	0.01	0.02
Crawler Crane- Greater than 200 ton	1.10	6.0	5.00	250	8,250	270.01	39.13	15.65	7.10	11.74	1.11	0.16	0.06	0.03	0.05
Crane - Mobile 65 ton	1.00	5.6	4.00	250	5,600	270.01	39.13	15.65	7.10	11.74	0.76	0.11	0.04	0.02	0.03
Cranes -Mobile 45 ton	0.45	6.0	4.00	250	2,700	270.01	39.13	15.65	7.10	11.74	0.36	0.05	0.02	0.01	0.02
Cranes - Mobile 35 ton	1.10	6.0	4.00	250	6,600	270.01	39.13	15.65	7.10	11.74	0.89	0.13	0.05	0.02	0.04
Bulldozer D6H	0.15	5.6	5.50	250	1,155	270.01	39.13	15.65	7.10	11.74	0.16	0.02	0.01	0.00	0.01
Bulldozer D4C	0.20	5.6	3.00	250	840	270.01	39.13	15.65	7.10	11.74	0.11	0.02	0.01	0.00	0.00
Excavator- Trencher	0.30	6.4	2.00	250	960	270.01	39.13	15.65	7.10	11.74	0.13	0.02	0.01	0.00	0.01
Excavator- Earth Scraper	0.15	6.4	9.00	250	2,160	270.01	39.13	15.65	7.10	11.74	0.29	0.04	0.02	0.01	0.01
Excavator-Motor Grader	0.35	5.6	5.00	250	2,450	270.01	39.13	15.65	7.10	11.74	0.33	0.05	0.02	0.01	0.01
Excavator- Backhoe/loader	0.80	6.0	2.50	250	3,000	270.01	39.13	15.65	7.10	11.74	0.41	0.06	0.02	0.01	0.02
Excavator - loader	0.20	5.6	2.50	250	700	270.01	39.13	15.65	7.10	11.74	0.09	0.01	0.01	0.00	0.00
Vibratory Roller	0.40	5.6	10.00	250	5,600	270.01	39.13	15.65	7.10	11.74	0.76	0.11	0.04	0.02	0.03
Portable Compaction roller	0.40	5.6	10.00	250	5,600	270.01	39.13	15.65	7.10	11.74	0.76	0.11	0.04	0.02	0.03
Truck- Water	0.90	5.2	3.13	250	3,662	170.68	106.79	15.33	7.10	9.59	0.31	0.20	0.03	0.01	0.02
Forklift	1.00	5.2	2.50	250	3,250	270.01	39.13	15.65	7.10	11.74	0.44	0.06	0.03	0.01	0.02
Dump Truck	0.30	6.0	3.13	250	1,409	170.68	106.79	15.33	7.10	9.59	0.12	0.08	0.01	0.01	0.01
Service Truck- 1 ton	0.45	5.2	1.56	250	913	74.40	59.47	5.57	7.10	4.83	0.03	0.03	0.00	0.00	0.00
Truck- Fuel/Lube	0.85	5.2	3.13	250	3,459	170.68	106.79	15.33	7.10	9.59	0.30	0.18	0.03	0.01	0.02
Concrete Pumper Truck	0.25	6.8	3.13	250	1,330	170.68	106.79	15.33	7.10	9.59	0.11	0.07	0.01	0.00	0.01
Tractor Truck 5th Wheel	0.90	5.6	3.13	250	3,944	270.01	39.13	15.65	7.10	11.74	0.53	0.08	0.03	0.01	0.02
Trucks- Pickup 3/4 ton	3.15	6.0	0.78	250	3,686	74.40	59.47	5.57	7.10	4.83	0.14	0.11	0.01	0.01	0.01
Trucks- 3 ton	1.65	5.6	1.56	250	3,604	74.40	59.47	5.57	7.10	4.83	0.13	0.11	0.01	0.01	0.01
Diesel Powered Welder	1.45	5.2	1.27	250	2,394	313.05	195.66	46.96	7.10	39.13	0.37	0.23	0.06	0.01	0.05
Light Plants	0.80	4.0	1.27	250	1,016	313.05	195.66	46.96	7.10	39.13	0.16	0.10	0.02	0.00	0.02
Portable Compaction- Vibratory Plate	1.10	5.6	0.25	250	385	313.05	195.66	46.96	7.10	39.13	0.06	0.04	0.01	0.00	0.01
Portable Compaction- Vibratory Ram	1.10	5.6	0.25	250	385	313.05	195.66	46.96	7.10	39.13	0.06	0.04	0.01	0.00	0.01
Articulating Boom Platforms	2.25	6.4	0.25	250	900	313.05	195.66	46.96	7.10	39.13	0.14	0.09	0.02	0.00	0.02
Pumps	1.80	4.0	1.27	250	2,286	313.05	195.66	46.96	7.10	39.13	0.36	0.22	0.05	0.01	0.04
Air Compressor 185 CFM	0.90	6.8	1.27	250	1,943	313.05	195.66	46.96	7.10	39.13	0.30	0.19	0.05	0.01	0.04
Air Compressor 750 CFM	1.30	6.8	1.27	250	2,807	313.05	195.66	46.96	7.10	39.13	0.44	0.27	0.07	0.01	0.05
Concrete Vibrators	3.20	4.0	0.25	250	800	313.05	195.66	46.96	7.10	39.13	0.13	0.08	0.02	0.00	0.02
Concrete Trowel Machine	0.30	4.0	1.27	250	381	313.05	195.66	46.96	7.10	39.13	0.06	0.04	0.01	0.00	0.01
Fusion Welder	0.30	6.4	1.27	250	610	313.05	195.66	46.96	7.10	39.13	0.10	0.06	0.01	0.00	0.01
Portable Power Generators	0.95	4.0	1.27	250	1,207	313.05	195.66	46.96	7.10	39.13	0.19	0.12	0.03	0.00	0.02
Total =											11.05	3.34	0.89	0.32	0.69

Notes:
(1) Based on average number of units operating over 24-month construction period.
(2) See notes on combustion emissions.

Phase I - Delivery Truck Daily Emissions (Month 10)

Number of Deliveries Per Day(1)	Average Round Trip Haul Distance (miles)	Vehicle Miles Traveled Per Day	Emission Factors (lbs/vmt)(2) NOx	CO	POC	SOx	PM10	Daily Emissions (lbs/day) NOx	CO	POC	SOx	PM10
13	165.6	2152.8	0.0280	0.0175	0.0025	0.0012	0.0016	60.32	37.74	5.42	2.49	3.39

Notes:
(1) Based on maximum number of daily truck deliveries during this month.
(2) See notes for combustion emissions.

Phase I - Delivery Truck Annual Emissions

Average Number of Deliveries Per Year(1)	Average Round Trip Haul Distance (miles)	Vehicle Miles Traveled Per Year	Emission Factors (lbs/vmt)(2) NOx	CO	POC	SOx	PM10	Annual Emissions (tons/yr) NOx	CO	POC	SOx	PM10
2073	165.6	343288.8	0.0280	0.0175	0.0025	0.0012	0.0016	4.81	3.01	0.43	0.20	0.27

Notes:
(1) Based on annual average number of truck deliveries over the 24-month construction period.
(2) See notes for combustion emissions.

Phase I - Delivery Truck Idling Emissions

Maximum Number of Truck Deliveries Per Year	Maximum Idling Time Per Truck Delivery (hrs)	Total Maximum Delivery Truck Idling Time Per Year (hrs/year)	PM10 Emission Factor(1) (lbs/hr)	Maximum Annual PM10 Delivery Truck Emissions (tons/yr)
2073	1	2073	0.004	0.004

Notes:
(1) Based on 1.91 g/hr idle emission rate for the composite HDD truck fleet in 2001 from EPA's PART5 model.

Phase I - Worker Travel Daily Emissions (Month 10)

Number of Workers Per Day(1)	Average Vehicle Occupancy (person/veh.)	Number of Round Trips Per Day	Average Round Trip Haul Distance (Miles)	Vehicle Miles Traveled Per Day (Miles)	Emission Factors (lbs/vmt)(2) NOx	CO	POC	SOx	PM10	Daily Emissions (lbs/day) NOx	CO	POC	SOx	PM10
284	1.16	244.83	165.60	40543.45	0.0029	0.0343	0.0027	0.0000	0.0001	116.47	1392.43	111.19	0.08	2.36

Notes:
(1) Based expected number of construction workers during this phase of construction.
(2) See notes for combustion emissions.

Phase I - Worker Travel Annual Emissions

Average Number of Workers Per Day(1)	Average Vehicle Occupancy (person/veh.)	Number of Round Trips Per Day	Average Round Trip Haul Distance (Miles)	Days per Year	Vehicle Miles Traveled Per Year	Emission Factors (lbs/vmt)(2) NOx	CO	POC	SOx	PM10	Annual Emissions (tons/yr) NOx	CO	POC	SOx	PM10
158.75	1.16	136.85	165.60	260.00	5,892,362	0.0029	0.0343	0.0027	0.0000	0.0001	8.46	101.18	8.08	0.01	0.17

Notes:
(1) Based on annual average number of workers over the 24-month construction period.
(2) See notes for combustion emissions.

Daily Fugitive Dust Emissions (Month 5)							
Equipment	Number of Units	Daily Process Rate Per Unit	Total Process Rate	Units	PM10 Emission Factor(1) (lbs/unit)	Control Factor(1) (%)	PM10 Emissions (lbs/day)
Bulldozer D6H	1	5.6	5.6	hours	0.7528		4.22
Bulldozer D4C	1	5.6	5.6	hours	0.7528		4.22
Excavator- Trencher Excavation							
Excavator- Earth Scraper Excavation	3	6.4	19.2	hours	0.7528		14.45
Excavator- Earth Scraper Unpaved Road Travel	3	10.9	32.6	vmt	0.2656	66%	2.92
Excavator-Motor Grader	1	16.8	16.8	vmt	0.2754		4.63
Excavator- Backhoe Excavation							
Excavator - Loader Excavation	1	2,743.0	2,743.0	tons	0.0002		0.58
Excavator - Loader Unpaved Road Travel	1	21.2	21.2	vmt	0.1148	66%	0.82
Water Truck Unpaved Road Travel	1	13.0	13.0	vmt	0.1522	66%	0.67
Forklift Unpaved Road Travel	1	10.4	10.4	vmt	0.0970	66%	0.34
Dump Truck Unpaved Road Travel	2	10.1	20.1	vmt	0.1589	66%	1.08
Dump Truck Unloading	2	1,371.5	2,743.0	tons	0.0002		0.58
Service Truck Unpaved Road Travel							
Fuel/Lube Truck Unpaved Road Travel	1	3.1	3.1	vmt	0.1181	66%	0.12
Concrete Pumper Truck Unpaved Road Travel							
Tractor Truck 5th Wheel Unpaved Road Travel							
Pickup Truck Unpaved Road Travel	2	15.4	30.9	vmt	0.0599	66%	0.62
3 ton Truck Unpaved Road Travel	1	7.7	7.7	vmt	0.0803	66%	0.21
Windblown Dust (active construction area)	N/A	474,213.6	474,213.6	sq.ft.	0.0000	66%	4.04
Worker Paved Road Travel	13	0.5	6.4	vmt	0.0005		0.00
Worker Unpaved Road Travel	13	0.2	2.0	vmt	0.0599	66%	0.04
Delivery Truck Paved Road Travel	13	0.5	6.4	vmt	0.0185		0.12
Delivery Truck Unpaved Road Travel	13	0.2	2.0	vmt	0.1589	66%	0.11
Total =							39.77

Notes:
(1) See notes for fugitive dust emission calculations.

Annual Fugitive Dust Emissions			
Activity	Average Daily PM10 Emissions(1) (lbs/day)	Days per Year	Annual PM10 Emissions (tons/yr)
Construction Activities	20.45	250	2.56
Windblown Dust	4.04	365	0.74
Total =			3.29

Notes:
(1) Based on average of daily emissions during Months 5 and 15.

Phase I - Natural Gas Pipeline Construction Heavy Equipment Daily Emissions

Equipment	Equipment Rating	Units	Load Factor(1)	Number of Units	Hrs/Day Per Unit	Emission Factors (1) NOx	CO	VOC	SOx	PM10	Units	Daily Emissions (lbs/day) NOx	CO	VOC	SOx	PM10
Trencher	150	bhp	0.38	4	8	6.90	1.00	0.40	0.18	0.30	gm/bhp-hr	27.75	4.02	1.61	0.73	1.21
Backhoe	100	bhp	0.38	2	8	6.90	1.00	0.40	0.18	0.30	gm/bhp-hr	9.25	1.34	0.54	0.24	0.40
Compactor	100	bhp	0.59	1	8	6.90	1.00	0.40	0.18	0.30	gm/bhp-hr	7.18	1.04	0.42	0.19	0.31
Paving machine	100	bhp	0.56	1	8	6.90	1.00	0.40	0.18	0.30	gm/bhp-hr	6.81	0.99	0.40	0.18	0.30
Grader	100	bhp	0.54	1	8	6.90	1.00	0.40	0.18	0.30	gm/bhp-hr	6.57	0.95	0.38	0.17	0.29
Water Truck	150	bhp	0.65	1	8	3.36	2.60	0.39	0.18	0.22	gm/bhp-hr	5.78	4.47	0.67	0.31	0.38
Fuel/lube truck	175	bhp	0.65	1	8	3.36	2.60	0.39	0.18	0.22	gm/bhp-hr	6.74	5.22	0.78	0.36	0.44
Total =												70.08	18.03	4.79	2.18	3.32

Notes:
(1) See notes for combustion emissions.

Water Supply Pipeline Construction Heavy Equipment Daily Emissions

Equipment	Equipment Rating	Units	Load Factor(1)	Number of Units	Hrs/Day Per Unit	Emission Factors (1) NOx	CO	VOC	SOx	PM10	Units	Daily Emissions (lbs/day) NOx	CO	VOC	SOx	PM10
Trencher	150	bhp	0.38	2	8	6.90	1.00	0.40	0.18	0.30	gm/bhp-hr	13.87	2.01	0.80	0.36	0.60
Backhoe	100	bhp	0.38	1	8	6.90	1.00	0.40	0.18	0.30	gm/bhp-hr	4.62	0.67	0.27	0.12	0.20
Compactor	100	bhp	0.59	1	8	6.90	1.00	0.40	0.18	0.30	gm/bhp-hr	7.18	1.04	0.42	0.19	0.31
Loader	150	bhp	0.38	1	8	6.90	1.00	0.40	0.18	0.30	gm/bhp-hr	6.94	1.01	0.40	0.18	0.30
Grader	100	bhp	0.54	1	8	6.90	1.00	0.40	0.18	0.30	gm/bhp-hr	6.57	0.95	0.38	0.17	0.29
Water Truck	150	bhp	0.65	1	8	3.36	2.60	0.39	0.18	0.22	gm/bhp-hr	5.78	4.47	0.67	0.31	0.38
Dump Truck	300	bhp	0.65	1	8	3.36	2.60	0.39	0.18	0.22	gm/bhp-hr	11.56	8.94	1.34	0.62	0.76
Total =												56.52	19.09	4.28	1.96	2.84

Notes:
(1) See notes for combustion emissions.

Transmission Line Interconnect Construction Heavy Equipment Daily Emissions

Equipment	Equipment Rating	Units	Load Factor(1)	Number of Units	Hrs/Day Per Unit	Emission Factors (1) NOx	CO	VOC	SOx	PM10	Daily Emissions (lbs/day) Units	NOx	CO	VOC	SOx	PM10
Auger	150	bhp	0.75	1	8	6.90	1.00	0.40	0.18	0.30	gm/bhp-hr	13.69	1.98	0.79	0.36	0.60
Backhoe	100	bhp	0.38	1	8	6.90	1.00	0.40	0.18	0.30	gm/bhp-hr	4.62	0.67	0.27	0.12	0.20
Crane	250	bhp	0.43	1	8	6.90	1.00	0.40	0.18	0.30	gm/bhp-hr	13.08	1.90	0.76	0.34	0.57
Crawler Tractor	300	bhp	0.57	1	6	6.90	1.00	0.40	0.18	0.30	gm/bhp-hr	15.61	2.26	0.90	0.41	0.68
Water Truck	150	bhp	0.65	1	8	3.36	2.60	0.39	0.18	0.22	gm/bhp-hr	5.78	4.47	0.67	0.31	0.38
Air Compressor	50	bhp	0.48	1	8	6.90	1.00	0.40	0.18	0.30	gm/bhp-hr	2.92	0.42	0.17	0.08	0.13
Total =												55.70	11.71	3.56	1.62	2.55

Notes:
(1) See notes for combustion emissions.

Wastewater Pipeline Construction Heavy Equipment Daily Emissions

Equipment	Equipment Rating	Units	Load Factor(1)	Number of Units	Hrs/Day Per Unit	Emission Factors (1) NOx	CO	VOC	SOx	PM10	Units	Daily Emissions (lbs/day) NOx	CO	VOC	SOx	PM10
Trencher	150	bhp	0.38	1	8	6.90	1.00	0.40	0.18	0.30	gm/bhp-hr	6.94	1.01	0.40	0.18	0.30
Backhoe	100	bhp	0.38	1	8	6.90	1.00	0.40	0.18	0.30	gm/bhp-hr	4.62	0.67	0.27	0.12	0.20
Compactor	100	bhp	0.59	1	8	6.90	1.00	0.40	0.18	0.30	gm/bhp-hr	7.18	1.04	0.42	0.19	0.31
Loader	150	bhp	0.38	1	8	6.90	1.00	0.40	0.18	0.30	gm/bhp-hr	6.94	1.01	0.40	0.18	0.30
Grader	100	bhp	0.54	1	8	6.90	1.00	0.40	0.18	0.30	gm/bhp-hr	6.57	0.95	0.38	0.17	0.29
Water Truck	150	bhp	0.65	1	8	3.36	2.60	0.39	0.18	0.22	gm/bhp-hr	5.78	4.47	0.67	0.31	0.38
Dump Truck	300	bhp	0.65	1	8	3.36	2.60	0.39	0.18	0.22	gm/bhp-hr	11.56	8.94	1.34	0.62	0.76
Total =												49.58	18.09	3.88	1.78	2.54

Notes:
(1) See notes for combustion emissions.

Phase I - Natural Gas Pipeline Construction Delivery Truck Daily Emissions

Number of Deliveries Per Day	Average Round Trip Haul Distance (miles)	Vehicle Miles Traveled Per Day	Emission Factors (lbs/vmt)(1)					Daily Emissions (lbs/day)				
			NOx	CO	VOC	SOx	PM10	NOx	CO	VOC	SOx	PM10
4	165.6	662.4	0.0280	0.0175	0.0025	0.0012	0.0016	18.56	11.61	1.67	0.77	1.04

Notes:
(1) See notes for combustion emissions.

Water Supply Pipeline Construction Delivery Truck Daily Emissions

Number of Deliveries Per Day	Average Round Trip Haul Distance (miles)	Vehicle Miles Traveled Per Day	Emission Factors (lbs/vmt)(1)					Daily Emissions (lbs/day)				
			NOx	CO	VOC	SOx	PM10	NOx	CO	VOC	SOx	PM10
6	165.6	993.6	0.0280	0.0175	0.0025	0.0012	0.0016	27.84	17.42	2.50	1.15	1.56

Notes:
(1) See notes for combustion emissions.

Transmission Line Interconnect Construction Delivery Truck Daily Emissions

Number of Deliveries Per Day	Average Round Trip Haul Distance (miles)	Vehicle Miles Traveled Per Day	Emission Factors (lbs/vmt)(1)					Daily Emissions (lbs/day)				
			NOx	CO	VOC	SOx	PM10	NOx	CO	VOC	SOx	PM10
10	165.6	1656	0.0280	0.0175	0.0025	0.0012	0.0016	46.40	29.03	4.17	1.92	2.61

Notes:
(1) See notes for combustion emissions.

Wastewater Pipeline Construction Delivery Truck Daily Emissions

Number of Deliveries Per Day	Average Round Trip Haul Distance (miles)	Vehicle Miles Traveled Per Day	Emission Factors (lbs/vmt)(1)					Daily Emissions (lbs/day)				
			NOx	CO	VOC	SOx	PM10	NOx	CO	VOC	SOx	PM10
6	165.6	993.6	0.0280	0.0175	0.0025	0.0012	0.0016	27.84	17.42	2.50	1.15	1.56

Notes:
(1) See notes for combustion emissions.

Phase I - Natural Gas Pipeline Construction Daily Fugitive Dust Emissions

Operation	Daily Process Rate Per Unit	Units	PM10 Emission Factor(1) (lbs/unit)	Control Factor(1) (%)	PM10 Emissions (lbs/day)
Windblown Dust	2000	sq.ft./day	2.52E-05	88%	0.01
Excavation	5333	cu.yd./day	0.0018	0%	9.60
Back filling	11200	tons/day	0.0001	0%	1.12
Grader Operation	10	vmt	0.2754	0%	2.75
Water truck unpaved surface travel	10	vmt	0.1522	88%	0.18
Delivery truck unpaved surface travel	2	vmt	0.15888	88%	0.04
Total =					13.69

Notes:
(1) See notes for fugitive dust emission calculations.

Water Supply Pipeline Construction Daily Fugitive Dust Emissions

Operation	Daily Process Rate Per Unit	Units	PM10 Emission Factor(1) (lbs/unit)	Control Factor(1) (%)	PM10 Emissions (lbs/day)
Windblown Dust	3000	sq.ft./day	2.52E-05	66%	0.03
Excavation	3000	cu.yd./day	0.0018	0%	5.40
Back filling	900	tons/day	0.0001	0%	0.09
Grader Operation	8	vmt	0.2754	0%	2.20
Water truck unpaved surface travel	6	vmt	0.1522	66%	0.31
Delivery truck unpaved surface travel	1	vmt	0.15888	66%	0.06
Total =					8.09

Notes:
(1) See notes for fugitive dust emission calculations.

Transmission Line Interconnect Construction Daily Fugitive Dust Emissions

Operation	Daily Process Rate Per Unit	Units	PM10 Emission Factor(1) (lbs/unit)	Control Factor(1) (%)	PM10 Emissions (lbs/day)
Windblown Dust	1000	sq.ft./day	2.52E-05	66%	0.01
Excavation	500	cu.yd./day	0.0018	0%	0.90
Back filling	250	tons/day	0.0001	0%	0.03
Water truck unpaved surface travel	2	vmt	0.1522	66%	0.10
Delivery truck unpaved surface travel	2	vmt	0.15888	66%	0.10
Total =					1.14

Notes:
(1) See notes for fugitive dust emission calculations.

Wastewater Pipeline Construction Daily Fugitive Dust Emissions

Operation	Daily Process Rate Per Unit	Units	PM10 Emission Factor(1) (lbs/unit)	Control Factor(1) (%)	PM10 Emissions (lbs/day)
Windblown Dust	3000	sq.ft./day	2.52E-05	66%	0.03
Excavation	1500	cu.yd./day	0.0018	0%	2.70
Back filling	900	tons/day	0.0001	0%	0.09
Grader Operation	8	vmt	0.2754	0%	2.20
Water truck unpaved surface travel	6	vmt	0.1522	66%	0.31
Delivery truck unpaved surface travel	1	vmt	0.15888	66%	0.06
Total =					5.39

Notes:
(1) See notes for fugitive dust emission calculations.

Notes - Fugitive Dust Emission Calculations

(1) Paved road travel emission factors for delivery trucks and worker automobiles are based on AP-42, Section 13.2.1, 10/97.
(2) Wind erosion emission factor for active construction area is based on "Improvement of Specific Emission Factors (BACM Project No. 1), Final Report", prepared for South Coast AQMD by Midwest Research Institute, March 1996.
(3) Finish grading emission factor is based on AP-42, Table 11.9-2, 1/95.
(4) Bulldozer and scraper excavation emission factors are based AP-42, Table 11.9.2, 1/95.
(5) Material unloading emission factors are based on AP-42, p. 13.2.4-3, 1/95.
(6) Loader unpaved road travel emission factor is based on AP-42, Section 13.2.2, 1/95.
(7) Backhoe trenching emission factor is based on AP-42, Table 11.9-2 (dragline operations), 1/95.
(8) Unpaved road travel emission factors for water trucks, fuel trucks, service trucks, dump trucks, scrapers, forklifts, pickup trucks, delivery trucks, 5th wheel tractor trucks, and concrete trucks are based on AP-42, Section 13.2.2, 9/98.
(9) Dust control efficiency for unpaved road travel and active excavation area is based on "Control of Open Fugitive Dust Sources", U.S. EPA, 9/88.

Notes - Combustion Emission Calculations

(1) For Construction Equipment
For heavy Diesel construction equipment, emission factors based on equipment meeting EPA 1996 off-road Diesel standards and use of CARB low-sulfur fuel.
For trucks, depending on size of truck, emissions factors based on MVE17G version 1.0c for heavy-heavy duty or medium duty Diesel trucks, fleet average for calendar year 2000.
For portable equipment, emission factors based on EPA's "Non-road Engine and Vehicle Emission Study Report", 11/91, Table 2-07, for generator sets, welders, pumps, and air compressors less than 50 hp.

(2) For Delivery Trucks
From MVE17G version 1.0c, heavy-heavy duty Diesel trucks, fleet average for calendar year 2000.

(3) For Worker Travel
From MVE17G version 1.0c, average of light duty automobiles and light duty trucks, fleet average for calendar year 2000.