

**APPENDIX C3**  
**Construction Air Quality Emission Model**

**Table 1 Summary of Construction Emissions**

Criteria Emissions	Highest Peak Any Project (lbs/day)	Total All Projects (tons/yr)	Worst Case Annual Emissions (Tons)		Federal Thresholds		State & PCAPCD Thresholds		
			Year 2	Year 3	tons/yr	Significant (Yes/No)	tons/yr	lbs/day	Significant (Yes/No)
Volatile Organic Compounds (VOC as CH <sub>4</sub> )	9	0.8	0.3	0.5	25	No	40	82	No
Carbon Monoxide (CO)	40	4.6	1.7	2.9	100	No	100		No
Oxides of Nitrogen (NO <sub>x</sub> as NO <sub>2</sub> )	67	3.4	1.3	2.1	100	No	40	82	No
Sulfur Dioxide (SO <sub>x</sub> as SO <sub>2</sub> )	0.1	0.0	0	0.00	100	No	40		No
Combustion Particulates (C-PM <sub>10</sub> )	4	0.2	0.1	0.15	100	No	15	82	No
Combustion Particulates (C-PM <sub>2.5</sub> )	4	0.2	0.1	0.13	100	No	10		No
Carbon Dioxide (GHG - CO <sub>2</sub> )	9,179	747	280	467					
Methane (GHG - CH <sub>4</sub> )	0.7	0.06	0.02	0.04					
Nitrous Oxide (GHG - N <sub>2</sub> O)	0.4	0.03	0.01	0.02					
Carbon Dioxide Equivalents (CO <sub>2</sub> eqv)	9,309	758	284	474					
Fugitive Dust (F-PM <sub>10</sub> )	165	6.7	2.5	4.2					
Fugitive Dust (F-PM <sub>2.5</sub> )	23	0.8	0.3	0.5					

Sources: SCAQMD 2008, BAAQMD 2009, EPA 2006, EPA 2009

**Notes:**

Highest Peak (lbs/day) = highest daily emissions, for any of the 7 projects

Total All Projects (tons/yr) = Total emissions for all 7 projects

Worst Case Emissions assumes the highest combination of concurrent projects to produce highest potential emissions:

Year 2: Duncan Creek Diversion Dam Modification, French Meadows Outlet Works Modification, Hell Hole Outlet Works Modification, and Middle Fork Interbay Dam Outlet Works Modification.

Year 3: Hell Hole Reservoir Seasonal Storage Increase Improvement, North Fork Long Canyon Diversion Dam Modification, South Fork Long Canyon Diversion Dam Modification.

Fugitive dust and combustion particulates are evaluated separately

**Table 2 Fugitive Dust Emissions Summary**

Fugitive Dust Emissions	Project Total tons/yr	Worst Case Emissions (lbs/day)		Federal Thresholds	
		Year 2	Year 3	tons/yr	Significant (Yes/No)
Fugitive Dust (F-PM <sub>10</sub> ) - Equipment	0.1	1.7	1.7	100	No
Fugitive Dust (F-PM <sub>10</sub> ) - Vehicles	6.6	163	163	100	No
Fugitive Dust (F-PM <sub>10</sub> ) - Combined	6.7	165	165	100	No
Fugitive Dust (F-PM <sub>2.5</sub> ) - Equipment	0.05	0.8	0.8	100	No
Fugitive Dust (F-PM <sub>2.5</sub> ) - Vehicles	0.8	163	22	100	No
Fugitive Dust (F-PM <sub>2.5</sub> ) - Combined	0.8	23	23	100	No

Notes:

Fugitive dust and combustion particulates are evaluated separately

**Table 3 Summary of GHG Emissions From Construction Equipment**

Greenhouse Gas Emissions	Peak	Project Total tons/yr	Worst Case Emissions (tons/yr)	
	lbs/day		Year 2	Year 3
Carbon Dioxide (GHG - CO <sub>2</sub> )	9,179	747	280	467
Methane (GHG - CH <sub>4</sub> )	0.7	0.1	0.02	0.04
Nitrous Oxide (GHG - N <sub>2</sub> O)	0.4	0.0	0.01	0.02
Carbon Dioxide Equivalents (CO <sub>2</sub> eqv)	9,309	758	284	474

Sources: SCAQMD 2008, EPA 2009

**Table 4 Emissions Significance Thresholds**

Criteria Emissions	Federal		California		Placer County (PCAPCD) <sup>e</sup>	
	Status <sup>a</sup>	tons/yr <sup>b</sup>	Status <sup>c</sup>	tons/yr <sup>d</sup>	tons/yr	lbs/da
Ozone (8 hr)	Non-Attainment Severe	25	Non-Attainment Severe	40	40	82*
Carbon Monoxide (CO)	Unclassified/Attainment	100	Unclassified	100	100	
Oxides of Nitrogen (NO <sub>x</sub> as NO <sub>2</sub> )	Unclassified/Attainment	100	Attainment	40	40	82
Sulfur Dioxide (SO <sub>x</sub> as SO <sub>2</sub> )	Unclassified/Attainment	100	Attainment	40	40	
Particulates (PM <sub>10</sub> )	Unclassified/Attainment	100	Non-Attainment	15	15	82
Particulates (PM <sub>2.5</sub> )	Unclassified/Attainment	100	Unclassified	10	10	

**Notes:**

Assumes all 7 project sites are located in Mountain Counties Air Basin

a US EPA Green Book (<http://www.epa.gov/air/oaqps/greenbk>)

b Federal thresholds from conformity determinations for federal actions: 40 CFR 51.853

c California thresholds from CARB (<http://www.arb.ca.gov/desig/adm/adm.htm>) with Non-Attainment status further defined by 40 CFR 81.305 (July 27, 2010)

d 40 CFR 51.166 (July 30, 2010)

e Placer County Air Pollution Control District (PCAPCD):

tons/yr: Definition of significant from Rule 502 New Source Review (as amended 2/11/10) PM<sub>2.5</sub> (10 tons/yr) for direct emissions

lbs/da: Project-level CEQA thresholds of significance for short-term construction emissions, assuming PM<sub>10</sub> from equipment emissions only (excludes fugitive dust)

\* As a reactive organic gas (ROG)

Table 5 Estimated Construction Schedule

Phase or Activity	Equipment and Vehicles		Rating BHP	Planned quantity	Activity Schedule			
	Type	Category			s	y	y	
<b>SMALL DIVERSION MODIFICATIONS</b>								
<b>Ducan Creek Diversion Dam Modification</b>	Pickup Truck (Workers)	onroad LD		10	120		120	
	Oversize load tractor trailer (5 axles or more)	onroad HHD		1	3		120	
	Excavator (Deere 160 D LC)	offroad	121	1	7	5		
	Bulldozer (Deere Model 700J)	offroad	115	1	7	5		
	Forklift (Case 586G Series 3)	offroad	80	1	14	2		
	Flatbed Utility Truck (Ford F-650 XL)	onroad MD		1	14		150	
	Excavator (Deere 160 D LC)	offroad	121	1	32	6		
	Bulldozer (Deere Model 700J)	offroad	115	1	24	6		
	Forklift (Case 586G Series 3)	offroad	80	1	20	2		
	Flatbed Utility Truck or Dump (Ford F-650 XL)	onroad MD		1	45		150	
	Compressor (Sullair 375 H-AF trailer mounted)	Offroad	130	1	20	6		
	Generator Magnum MMG25 23KVA Diesel	Offroad	30	1	40	10		
	Mobile Crane (Link-Belt RTC-8030 Series II)	offroad	164	1	21	5		
	Concrete Transport Truck (assume F650 XL)	onroad HHD		8	14		150	
	Concrete Pumpers (Schwing SP 260)	Offroad	68	1	14	4		
	Lowboy tractor and Trailer ( Intern. Paystar 5900 FSA)	onroad HHD		1	8		150	
	Forklift (Case 586G Series 3)	offroad	80	1	15	4		
	Flatbed Utility Truck or Dump (Ford F-650 XL)	onroad MD		1	7		150	
	Backhoe (Deere 410J)	offroad	98	1	15	4		
	Lowboy tractor and Trailer( Intern. Paystar 5900 FSA)	onroad HHD		1	2		150	
<b>North Fork Long Canyon Diversion Dam Modification</b>	Pickup Truck (Workers)	onroad LD		10	120		120	
	Oversize load tractor trailer (5 axles or more)	onroad HHD		1	3		120	
	Excavator (Deere 160 D LC)	offroad	121	1	7	5		
	Bulldozer (Deere Model 700J)	offroad	115	1	7	5		
	Forklift (Case 586G Series 3)	offroad	80	1	14	2		
	Flatbed Utility Truck (Ford F-650 XL)	onroad MD		1	14		150	
	Excavator (Deere 160 D LC)	offroad	121	1	32	6		
	Bulldozer (Deere Model 700J)	offroad	115	1	24	6		
	Forklift (Case 586G Series 3)	offroad	80	1	20	2		
	Flatbed Utility Truck or Dump (Ford F-650 XL)	onroad MD		1	45		150	
	Compressor (Sullair 375 H-AF trailer mounted)	Offroad	130	1	20	6		
	Generator Magnum MMG25 23KVA Diesel	Offroad	30	1	40	10		
	Mobile Crane (Link-Belt RTC-8030 Series II)	offroad	164	1	21	5		
	Concrete Transport Truck (assume F650 XL)	onroad HHD		8	14		150	
	Concrete Pumpers (Schwing SP 260)	Offroad	68	1	14	4		
	Lowboy tractor and Trailer ( Intern. Paystar 5900 FSA)	onroad HHD		1	8		150	
	Forklift (Case 586G Series 3)	offroad	80	1	15	4		
	<b>North Fork Long Canyon Diversion Dam Modification (continued)</b>	Flatbed Utility Truck or Dump (Ford F-650 XL)	onroad MD		1	7		150
		Backhoe (Deere 410J)	offroad	98	1	15	4	
		Lowboy tractor and Trailer( Intern. Paystar 5900 FSA)	onroad HHD		1	2		150
<b>South Fork Long Canyon Diversion Dam Modification</b>	Pickup Truck (Workers)	onroad LD		10	120		120	
	Oversize load tractor trailer (5 axles or more)	onroad HHD		1	3		120	
	Excavator (Deere 160 D LC)	offroad	121	1	7	5		
	Bulldozer (Deere Model 700J)	offroad	115	1	7	5		
	Forklift (Case 586G Series 3)	offroad	80	1	14	2		
	Flatbed Utility Truck (Ford F-650 XL)	onroad MD		1	14		150	
	Excavator (Deere 160 D LC)	offroad	121	1	32	6		
	Bulldozer (Deere Model 700J)	offroad	115	1	24	6		
	Forklift (Case 586G Series 3)	offroad	80	1	20	2		
	Flatbed Utility Truck or Dump (Ford F-650 XL)	onroad MD		1	45		150	
	Compressor (Sullair 375 H-AF trailer mounted)	Offroad	130	1	20	6		
	Generator Magnum MMG25 23KVA Diesel	Offroad	30	1	40	10		
	Mobile Crane (Link-Belt RTC-8030 Series II)	offroad	164	1	21	5		
	Concrete Transport Truck (assume F650 XL)	onroad HHD		8	14		150	
	Concrete Pumpers (Schwing SP 260)	Offroad	68	1	14	4		
	Lowboy tractor and Trailer ( Intern. Paystar 5900 FSA)	onroad HHD		1	8		150	
	Forklift (Case 586G Series 3)	offroad	80	1	15	4		
	Flatbed Utility Truck or Dump (Ford F-650 XL)	onroad MD		1	7		150	
	Backhoe (Deere 410J)	offroad	98	1	15	4		
	Lowboy tractor and Trailer( Intern. Paystar 5900 FSA)	onroad HHD		1	2		150	

**Table 5 Estimated Construction Schedule**

Phase or Activity	Equipment and Vehicles		Rating BHP	Planned quantity	Activity Schedule		
	Type	Category			s	y	y
<b>OUTLET WORKS MODIFICATIONS</b>							
<b>Hell Hole Dam Outlet Works Modification</b>	Pickup Truck (Workers)	onroad LD		10	60		120
	Excavator (Deere 160 D LC)	offroad	121	1	7	5	
	Forklift (Case 586G Series 3)	offroad	80	1	7	2	
	Flatbed Utility Truck (Ford F-650 XL)	onroad MD		1	7		150
	Excavator (Deere 160 D LC)	offroad	121	1	32	6	
	Bulldozer (Deere Model 700J)	offroad	115	1	14	6	
	Forklift (Case 586G Series 3)	offroad	80	1	45	2	
	Flatbed Utility Truck or Dump (Ford F-650 XL)	onroad MD		1	30		150
	Backhoe (Deere 410J) with Hoe ram breaker	offroad MD	98	1	20	4	
	Compressor (Sullair 375 H-AF trailer mounted)	Offroad	130	1	20	6	
	Mobile Crane (Link-Belt RTC-8030 Series II)	Off Road	164	1	32	5	
	Concrete Transport Truck (assume F650 XL)	onroad HHD		1	7		150
	Concrete Pumpers (Schwing SP 260)	onroad		1	7	4	
	Lowboy tractor and Trailer ( Intern. Paystar 5900 FSA)	onroad HHD		1	8		150
	Forklift (Case 586G Series 3)	offroad	80	1	7	4	
	Flatbed Utility Truck or Dump (Ford F-650 XL)	onroad MD		1	7		150
	Backhoe (Deere 410J)	offroad	98	1	15	4	
Lowboy tractor and Trailer(Paystar 5900 FSA)	onroad HHD		1	2		150	
<b>French Meadows Dam Outlet Works Modification</b>	Pickup Truck (Workers)	onroad LD		4	30		120
	Oversize load tractor trailer (5 axles or more)	onroad HHD		1	3		120
	Backhoe (Deere 410J)	offroad MD	98	1	3	3	
	Flatbed Utility Truck (Ford F-650 XL)	onroad MD		1	3		150
	Backhoe (Deere 410J) with Hoe ram breaker	offroad	98	1	20	2	
	Flatbed Utility Truck or Dump (Ford F-650 XL)	onroad MD		1	4		150
	Welder Genset Hobart Champion elite	Offroad	23	1	4	4	
	Generator Magnum MMG25 23KVA Diesel	offroad	30	1	20	8	
	Mobile Crane (Link-Belt RTC-8030 Series II)	offroad	164	1	2	4	
	Concrete Transport Truck (assume F650 XL)	onroad HHD		1	1		150
	Concrete Pumper (Schwing SP 260)	offroad	68	1	1	4	
	Lowboy tractor and Trailer (Paystar 5900 FSA)	onroad HHD		1	1		150
	Flatbed Utility Truck or Dump (Ford F-650 XL)	onroad MD		1	2		150
	Backhoe (Deere 410J)	offroad MD	98	1	1	4	
Lowboy tractor and Trailer(Paystar 5900 FSA)	onroad HHD		1	2		150	
<b>Middle Fork Interbay Dam Outlet Works Modification</b>	Pickup Truck (Workers)	onroad LD		4	30		120
	Oversize load tractor trailer (5 axles or more)	onroad HHD		1	3		120
	Backhoe (Deere 410J)	offroad	98	1	3	3	
	Flatbed Utility Truck (Ford F-650 XL)	onroad MD		1	3		150
	Backhoe (Deere 410J) with Hoe ram breaker	offroad	98	1	20	4	
	Flatbed Utility Truck or Dump (Ford F-650 XL)	onroad MD		1	8		150
	Welder Genset Hobart Champion elite	Offroad	23	1	58	5	
	Generator Magnum MMG25 23KVA Diesel	offroad	30	1	15	8	
	Mobile Crane (Link-Belt RTC-8030 Series II)	offroad	164	1	10	4	
	Concrete Transport Truck (assume F650 XL)	onroad HHD		1	5		150
	Concrete Pumper (Schwing SP 260)	offroad	68	1	5	4	
	Lowboy tractor and Trailer (Paystar 5900 FSA)	onroad HHD		1	3		150
	Flatbed Utility Truck or Dump (Ford F-650 XL)	onroad MD		1	8		150
	Backhoe (Deere 410J)	offroad MD	98	1	3	4	
Lowboy tractor and Trailer(Paystar 5900 FSA)	onroad HHD		1	2		150	

**Table 5 Estimated Construction Schedule**

Phase or Activity	Equipment and Vehicles		Rating BHP	Planned quantity	Activity Schedule		
	Type	Category			s	y	y
<b>HELL HOLE RESERVOIR SEASONAL STORAGE INCREASE IMPROVEMENT</b>							
<b>Hell Hole Reservoir Seasonal Storage Increase Improvement</b>	Pickup Truck (Workers)	onroad LD		10	120		120
	Oversize load tractor trailer (5 axles or more)	onroad HHD		1	3		120
	Front Loader (Deere 444 K)	offroad	117	1	21	6	
	Flatbed Utility Truck or Dump (Ford F-650 XL)	onroad MD		1	32		100
	Backhoe (Deere 410J)	offroad MD	98	1	21	6	
	Compressor (Sullair 375 H-AF trailer mounted)	onroad MD	130	1	21	6	
	Flatbed Utility Truck or Dump (Ford F-650 XL)	onroad MD		1	40		150
	Lowboy tractor and Trailer ( Intern. Paystar 5900 FSA)	onroad HHD		1	8		150
	Backhoe (Deere 410J) (Ramhoe attachment)	offroad	98	1	32	8	
	Electrical Boom Type Line Truck (Ford F-650 XL)	onroad MD	325	1	10	6	
	Generator Magnum MMG25 23KVA Diesel	offroad	30	1	120	10	
	Mobile Crane (Link-Belt RTC-8030 Series II)	offroad	164	1	21	6	
	Concrete Transport Truck (assume F650 XL)	onroad HHD		1	8		150
	Concrete Pumpers (Schwing SP 260)	offroad	68	1	8	4	
	Forklift (Case 586G Series 3)	offroad	80	1	32	4	
	Backhoe (Deere 410J)	offroad	98	1	21	4	
	Flatbed Utility Truck or Dump (Ford F-650 XL)	onroad MD		1	5		150
	Forklift (Case 586G Series 3)	offroad	80	1	10	4	
Generator Magnum MMG25 23KVA Diesel	offroad	30	1	15	10		
Lowboy tractor and Trailer( Intern. Paystar 5900 FSA)	onroad HHD		1	2		150	

Source: Christensen Associates 2010

Notes:

LD = light duty; MD = medium duty, HHD = heavy heavy duty, BHP = brake horsepower

Contractor will work five, 10-hr days per week

Daily equipment operating hours account for downtime related to staging, breaks, lunch, maintenance, repairs, etc.

Table 6. Estimated Equipment and Vehicle Activity.

Phase or Activity	Equipment and Vehicles		Rating	Planned	Daily Max		Project Total		
	Type	Category	BHP	quantity	hours	VMT	hours	VMT	
<b>SMALL DIVERSION MODIFICATIONS</b>									
<b>Duncan Creek Diversion Dam Modification</b>	Pickup Truck (Workers)	onroad LD		10		1200		144,000	
	Oversize load tractor trailer (5 axles or more)	onroad HHD		1		120		360	
	Excavator (Deere 160 D LC)	offroad	121	1	5		35		
	Bulldozer (Deere Model 700J)	offroad	115	1	5		35		
	Forklift (Case 586G Series 3)	offroad	80	1	2		28		
	Flatbed Utility Truck (Ford F-650 XL)	onroad MD		1		150		2,100	
	Excavator (Deere 160 D LC)	offroad	121	1	6		192		
	Bulldozer (Deere Model 700J)	offroad	115	1.00	6		144		
	Forklift (Case 586G Series 3)	offroad	80	1.00	2		40		
	Flatbed Utility Truck or Dump (Ford F-650 XL)	onroad MD		1		150		6,750	
	Compressor (Sullair 375 H-AF trailer mounted)	Offroad	130	1	6		120		
	Generator Magnum MMG25 23KVA Diesel	Offroad	30	1	10		400		
	Mobile Crane (Link-Belt RTC-8030 Series II)	offroad	164	1	5		105		
	Concrete Transport Truck (assume F650 XL)	onroad HHD		8		1200		16,800	
	Concrete Pumpers (Schwing SP 260)	Offroad	68	1	4		56		
	Lowboy tractor and Trailer ( Intern. Paystar 5900 FSA)	onroad HHD		1		150		1,200	
	Forklift (Case 586G Series 3)	offroad	80	1	4		60		
	Flatbed Utility Truck or Dump (Ford F-650 XL)	onroad MD		1		150		1,050	
	Backhoe (Deere 410J)	offroad	98	1	4		60		
	Lowboy tractor and Trailer( Intern. Paystar 5900 FSA)	onroad HHD		1		150	10	300	
<b>North Fork Long Canyon Diversion Dam Modification</b>	Pickup Truck (Workers)	onroad LD		10		1200		144,000	
	Oversize load tractor trailer (5 axles or more)	onroad HHD		1		120		360	
	Excavator (Deere 160 D LC)	offroad	121	1	5		35		
	Bulldozer (Deere Model 700J)	offroad	115	1	5		35		
	Forklift (Case 586G Series 3)	offroad	80	1	2		28		
	Flatbed Utility Truck (Ford F-650 XL)	onroad MD		1		150		2,100	
	Excavator (Deere 160 D LC)	offroad	121	1	6		192		
	Bulldozer (Deere Model 700J)	offroad	115	1	6		144		
	Forklift (Case 586G Series 3)	offroad	80	1	2		40		
	Flatbed Utility Truck or Dump (Ford F-650 XL)	onroad MD		1		150		6,750	
	Compressor (Sullair 375 H-AF trailer mounted)	Offroad	130	1	6		120		
	Generator Magnum MMG25 23KVA Diesel	Offroad	30	1	10		400		
	Mobile Crane (Link-Belt RTC-8030 Series II)	offroad	164	1	5		105		
	Concrete Transport Truck (assume F650 XL)	onroad HHD		8		1200		16,800	
	Concrete Pumpers (Schwing SP 260)	Offroad	68	1	4		56		
	Lowboy tractor and Trailer ( Intern. Paystar 5900 FSA)	onroad HHD		1		150		1,200	
	<b>North Fork Long Canyon Diversion Dam Modification (continued)</b>	Forklift (Case 586G Series 3)	offroad	80	1	4		60	
		Flatbed Utility Truck or Dump (Ford F-650 XL)	onroad MD		1		150		1,050
		Backhoe (Deere 410J)	offroad	98	1	4		60	
		Lowboy tractor and Trailer( Intern. Paystar 5900 FSA)	onroad HHD		1		150		300

Table 6. Estimated Equipment and Vehicle Activity.

Phase or Activity	Equipment and Vehicles		Rating	Planned	Daily Max		Project Total	
	Type	Category	BHP	quantity	hours	VMT	hours	VMT
<b>South Fork Long Canyon Diversion Dam Modification</b>	Pickup Truck (Workers)	onroad LD		10		1200		144,000
	Oversize load tractor trailer (5 axles or more)	onroad HHD		1		120		360
	Excavator (Deere 160 D LC)	offroad	121	1	5		35	
	Bulldozer (Deere Model 700J)	offroad	115	1	5		35	
	Forklift (Case 586G Series 3)	offroad	80	1	2		28	
	Flatbed Utility Truck (Ford F-650 XL)	onroad MD		1		150		2,100
	Excavator (Deere 160 D LC)	offroad	121	1	6		192	
	Bulldozer (Deere Model 700J)	offroad	115	1	6		144	
	Forklift (Case 586G Series 3)	offroad	80	1	2		40	
	Flatbed Utility Truck or Dump (Ford F-650 XL)	onroad MD		1		150		6,750
	Compressor (Sullair 375 H-AF trailer mounted)	Offroad	130	1	6		120	
	Generator Magnum MMG25 23KVA Diesel	Offroad	30	1	10		400	
	Mobile Crane (Link-Belt RTC-8030 Series II)	offroad	164	1	5		105	
	Concrete Transport Truck (assume F650 XL)	onroad HHD		8		1200		16,800
	Concrete Pumpers (Schwing SP 260)	Offroad	68	1	4		56	
	Lowboy tractor and Trailer ( Intern. Paystar 5900 FSA)	onroad HHD		1		150		1,200
	Forklift (Case 586G Series 3)	offroad	80	1	4		60	
	Flatbed Utility Truck or Dump (Ford F-650 XL)	onroad MD		1		150		1,050
Backhoe (Deere 410J)	offroad	98	1	4		60		
Lowboy tractor and Trailer( Intern. Paystar 5900 FSA)	onroad HHD		1		150		300	
<b>OUTLET WORKS MODIFICATIONS</b>								
<b>Hell Hole Dam Outlet Works Modification</b>	Pickup Truck (Workers)	offroad		10		1200		72,000
	Excavator (Deere 160 D LC)	offroad	121	1	5		35	
	Forklift (Case 586G Series 3)	offroad	80	1	2		14	
	Flatbed Utility Truck (Ford F-650 XL)	offroad		1		150		1,050
	Excavator (Deere 160 D LC)	offroad	121	1	6		192	
	Bulldozer (Deere Model 700J)	offroad	115	1	6		84	
	Forklift (Case 586G Series 3)	offroad	80	1	2		90	
	Flatbed Utility Truck or Dump (Ford F-650 XL)	onroad HHD		1		150		4,500
	Backhoe (Deere 410J) with Hoe ram breaker	offroad	98	1	4		80	
	Compressor (Sullair 375 H-AF trailer mounted)	offroad	130	1	6		120	
	Mobile Crane (Link-Belt RTC-8030 Series II)	offroad	164	1	5		160	
	Concrete Transport Truck (assume F650 XL)	offroad		1		150		1,050
	Concrete Pumpers (Schwing SP 260)	offroad		1		0		0
	Lowboy tractor and Trailer ( Intern. Paystar 5900 FSA)	offroad		1		150		1,200
	Forklift (Case 586G Series 3)	offroad	80	1	4		28	
	Flatbed Utility Truck or Dump (Ford F-650 XL)	offroad		1		150		1,050
Backhoe (Deere 410J)	offroad	98	1	4		60		
Lowboy tractor and Trailer( Intern. Paystar 5900 FSA)	offroad		1		150		300	
<b>French Meadows Dam Outlet Works Modification</b>	Pickup Truck (Workers)	onroad LD		4		480		14,400
	Oversize load tractor trailer (5 axles or more)	onroad HHD		1		120		360
	Backhoe (Deere 410J)	offroad MD	98	1	3		9	
	Flatbed Utility Truck (Ford F-650 XL)	onroad MD		1		150		450
	Backhoe (Deere 410J) with Hoe ram breaker	offroad MD	98	1	2		40	
	Flatbed Utility Truck or Dump (Ford F-650 XL)	onroad MD		1		150		600
	Welder Hobart Champion elite	offroad LD	23	1	4		16	
	Generator Magnum MMG25 23KVA Diesel	offroad	30	1	8		160	
	Mobile Crane (Link-Belt RTC-8030 Series II)	offroad	164	1	4		8	
	Concrete Transport Truck (assume F650 XL)	onroad HHD		1		150		150
	Concrete Pumper (Schwing SP 260)	offroad	68	1	4		4	
	Lowboy tractor and Trailer ( Intern. Paystar 5900 FSA)	offroad		1		150		150
	Flatbed Utility Truck or Dump (Ford F-650 XL)	offroad		1		150		300
	Backhoe (Deere 410J)	offroad	98	1	4		4	
	Lowboy tractor and Trailer( Intern. Paystar 5900 FSA)	onroad HHD		1		150		300



**Table 6. Estimated Equipment and Vehicle Activity.**

Phase or Activity	Equipment and Vehicles		Rating	Planned	Daily Max		Project Total	
	Type	Category	BHP	quantity	hours	VMT	hours	VMT
<b>Middle Fork Interbay Dam Outlet Works Modification</b>	Pickup Truck (Workers)	onroad LD		4		480		14,400
	Oversize load tractor trailer (5 axles or more)	onroad HHD		1		120		360
	Backhoe (Deere 410J)	offroad MD	98	1	3		9	
	Flatbed Utility Truck (Ford F-650 XL)	onroad MD		1		150		450
	Backhoe (Deere 410J) with Hoe ram breaker	offroad MD	98	1	4		80	
	Flatbed Utility Truck or Dump (Ford F-650 XL)	onroad MD		1		150		1,200
	Welder Hobart Champion elite	offroad LD	23	1	5		290	
	Generator Magnum MMG25 23KVA Diesel	offroad	30	1	8		120	
	Mobile Crane (Link-Belt RTC-8030 Series II)	offroad	164	1	4		40	
	Concrete Transport Truck (assume F650 XL)	onroad HHD		1		150		750
	Concrete Pumper (Schwing SP 260)	offroad	68	1	4		20	
	Lowboy tractor and Trailer ( Intern. Paystar 5900 FSA)	offroad		1		150		450
	Flatbed Utility Truck or Dump (Ford F-650 XL)	offroad		1		150		1,200
	Backhoe (Deere 410J)	offroad	98	1	4		12	
Lowboy tractor and Trailer( Intern. Paystar 5900 FSA)	onroad HHD		1		150		300	
<b>HELL HOLE RESERVOIR SEASONAL STORAGE INCREASE IMPROVEMENT</b>								
<b>Hell Hole Reservoir Seasonal Storage Increase Improvement</b>	Pickup Truck (Workers)	onroad LD		10		1200		144,000
	Oversize load tractor trailer (5 axles or more)	onroad HHD		1		120		360
	Front Loader (Deere 444 K)	offroad	117	1	6		126	
	Flatbed Utility Truck or Dump (Ford F-650 XL)	onroad MD		1		100		3,200
	Backhoe (Deere 410J)	offroad MD	98	1	6		126	
	Compressor (Sullair 375 H-AF trailer mounted)	onroad MD	130	1	6		126	
	Flatbed Utility Truck or Dump (Ford F-650 XL)	onroad MD		1		150		6,000
	Lowboy tractor and Trailer ( Intern. Paystar 5900 FSA)	onroad HHD		1		150		1,200
	Backhoe (Deere 410J) (Ramhoe attachment)	offroad	98	1	8		256	
	Electrical Boom Type Line Truck (Ford F-650 XL)	onroad MD	325	1	6		60	
	Generator Magnum MMG25 23KVA Diesel	offroad	30	1	10		1,200	
	Mobile Crane (Link-Belt RTC-8030 Series II)	offroad	164	1	6		126	
	Concrete Transport Truck (assume F650 XL)	onroad HHD		1		150		1,200
	Concrete Pumpers (Schwing SP 260)	offroad	68	1	4		32	
	Forklift (Case 586G Series 3)	offroad	80	1	4		128	
	Backhoe (Deere 410J)	offroad	98	1	4		84	
	Flatbed Utility Truck or Dump (Ford F-650 XL)	onroad MD		1		150		750
	Forklift (Case 586G Series 3)	offroad	80	1	4		40	
Generator Magnum MMG25 23KVA Diesel	offroad	30	1	10		150		
Lowboy tractor and Trailer( Intern. Paystar 5900 FSA)	onroad HHD		1		150		300	

Source: Source: Christensen Associates 2010

Notes:

LD = light duty; MD = medium duty, HHD = heavy heavy duty, BHP = brake horsepower

Table 7. Estimated Emission Factors.

Equipment and Vehicles		Rating	ROG	CO	NO <sub>x</sub>	SO <sub>x</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	CO <sub>2</sub> eqv
Type	Category	BHP	lbs/unit	lbs/unit	lbs/unit	lbs/unit	lbs/unit	lbs/unit	lbs/unit	lbs/unit	lbs/unit	lbs/unit
<b>SMALL DIVERSION MODIFICATIONS</b>												
<b>Duncan Creek Diversion Dam Modification</b>												
Pickup Truck (Workers)	onroad LD		0.000796	0.007655	0.000776	0.000011	0.000090	0.000057	1.1	0.000072	0.000029	1.1
Oversize load tractor trailer (5 axles or more)	onroad HHD		0.002528	0.010215	0.030924	0.000040	0.001496	0.001294	4.2	0.000117	0.000110	4.3
Excavator (Deere 160 D LC)	offroad	121	0.118276	0.521969	0.729971	0.000864	0.065748	0.060488	73.623101	0.010672	0.004743	75.272489
Bulldozer (Deere Model 700J)	offroad	115	0.136629	0.479374	0.773334	0.000740	0.069758	0.064177	62.886944	0.012328	0.005479	64.792277
Forklift (Case 586G Series 3)	offroad	80	0.050308	0.190227	0.214308	0.000265	0.019667	0.018094	21.766075	0.004539	0.002017	22.467639
Flatbed Utility Truck (Ford F-650 XL)	onroad MD		0.002238	0.015457	0.017324	0.000027	0.000650	0.000550	2.766284	0.000107	0.000166	2.817856
Excavator (Deere 160 D LC)	offroad	121	0.118276	0.521969	0.729971	0.000864	0.065748	0.060488	73.623101	0.010672	0.004743	75.272489
Bulldozer (Deere Model 700J)	offroad	115	0.136629	0.479374	0.773334	0.000740	0.069758	0.064177	62.886944	0.012328	0.005479	64.792277
Forklift (Case 586G Series 3)	offroad	80	0.050308	0.190227	0.214308	0.000265	0.019667	0.018094	21.766075	0.004539	0.002017	22.467639
Flatbed Utility Truck or Dump (Ford F-650 XL)	onroad MD		0.002238	0.015457	0.017324	0.000027	0.000650	0.000550	2.766284	0.000107	0.000166	2.817856
Compressor (Sullair 375 H-AF trailer mounted)	Offroad	130	0.093564	0.361167	0.599164	0.000632	0.049604	0.045636	54.501661	0.008442	0.003752	55.806445
Generator Magnum MMG25 23KVA Diesel	Offroad	30	0.041280	0.130748	0.189856	0.000258	0.012786	0.011763	20.229730	0.003725	0.001655	20.805394
Mobile Crane (Link-Belt RTC-8030 Series II)	offroad	164	0.106718	0.460043	0.777617	0.000841	0.049024	0.045102	74.305267	0.009629	0.004280	75.793487
Concrete Transport Truck (assume F650 XL)	onroad HHD		0.002528	0.010215	0.030924	0.000040	0.001496	0.001294	4.215908	0.000117	0.000110	4.251047
Concrete Pumpers (Schwing SP 260)	Offroad	68	0.029343	0.085197	0.154833	0.000223	0.009058	0.008333	17.556175	0.002648	0.001177	17.965377
Lowboy tractor and Trailer (Paystar 5900 FSA)	onroad HHD		0.002528	0.010215	0.030924	0.000040	0.001496	0.001294	4.215908	0.000117	0.000110	4.251047
Forklift (Case 586G Series 3)	offroad	80	0.050308	0.190227	0.214308	0.000265	0.019667	0.018094	21.766075	0.004539	0.002017	22.467639
Flatbed Utility Truck or Dump (Ford F-650 XL)	onroad MD		0.002238	0.015457	0.017324	0.000027	0.000650	0.000550	2.766284	0.000107	0.000166	2.817856
Backhoe (Deere 410J)	offroad	98	0.247320	0.653237	0.531722	0.000630	0.056706	0.052170	48.764048	0.022315	0.009918	52.212996
Lowboy tractor and Trailer(Paystar 5900 FSA)	onroad HHD		0.002528	0.010215	0.030924	0.000040	0.001496	0.001294	4.215908	0.000117	0.000110	4.251047
<b>North Fork Long Canyon Diversion Dam Modification</b>												
Pickup Truck (Workers)	onroad LD		0.000796	0.007655	0.000776	0.000011	0.000090	0.000057	1.1	0.000072	0.000029	1.1
Oversize load tractor trailer (5 axles or more)	onroad HHD		0.002528	0.010215	0.030924	0.000040	0.001496	0.001294	4.2	0.000117	0.000110	4.3
Excavator (Deere 160 D LC)	offroad	121	0.118276	0.521969	0.729971	0.000864	0.065748	0.060488	73.623101	0.010672	0.004743	75.272489
Bulldozer (Deere Model 700J)	offroad	115	0.136629	0.479374	0.773334	0.000740	0.069758	0.064177	62.886944	0.012328	0.005479	64.792277
Forklift (Case 586G Series 3)	offroad	80	0.050308	0.190227	0.214308	0.000265	0.019667	0.018094	21.766075	0.004539	0.002017	22.467639
Flatbed Utility Truck (Ford F-650 XL)	onroad MD		0.002238	0.015457	0.017324	0.000027	0.000650	0.000550	2.766284	0.000107	0.000166	2.817856
Excavator (Deere 160 D LC)	offroad	121	0.118276	0.521969	0.729971	0.000864	0.065748	0.060488	73.623101	0.010672	0.004743	75.272489
Bulldozer (Deere Model 700J)	offroad	115	0.136629	0.479374	0.773334	0.000740	0.069758	0.064177	62.886944	0.012328	0.005479	64.792277
Forklift (Case 586G Series 3)	offroad	80	0.050308	0.190227	0.214308	0.000265	0.019667	0.018094	21.766075	0.004539	0.002017	22.467639
Flatbed Utility Truck or Dump (Ford F-650 XL)	onroad MD		0.002238	0.015457	0.017324	0.000027	0.000650	0.000550	2.766284	0.000107	0.000166	2.817856
Compressor (Sullair 375 H-AF trailer mounted)	Offroad	130	0.093564	0.361167	0.599164	0.000632	0.049604	0.045636	54.501661	0.008442	0.003752	55.806445
Generator Magnum MMG25 23KVA Diesel	Offroad	30	0.041280	0.130748	0.189856	0.000258	0.012786	0.011763	20.229730	0.003725	0.001655	20.805394
Mobile Crane (Link-Belt RTC-8030 Series II)	offroad	164	0.106718	0.460043	0.777617	0.000841	0.049024	0.045102	74.305267	0.009629	0.004280	75.793487
Concrete Transport Truck (assume F650 XL)	onroad HHD		0.002528	0.010215	0.030924	0.000040	0.001496	0.001294	4.215908	0.000117	0.000110	4.251047
Concrete Pumpers (Schwing SP 260)	Offroad	68	0.029343	0.085197	0.154833	0.000223	0.009058	0.008333	17.556175	0.002648	0.001177	17.965377
Lowboy tractor and Trailer ( Intern. Paystar 5900 FSA)	onroad HHD		0.002528	0.010215	0.030924	0.000040	0.001496	0.001294	4.215908	0.000117	0.000110	4.251047
Forklift (Case 586G Series 3)	offroad	80	0.050308	0.190227	0.214308	0.000265	0.019667	0.018094	21.766075	0.004539	0.002017	22.467639
Flatbed Utility Truck or Dump (Ford F-650 XL)	onroad MD		0.002238	0.015457	0.017324	0.000027	0.000650	0.000550	2.766284	0.000107	0.000166	2.817856

Table 7. Estimated Emission Factors.

Equipment and Vehicles		Rating	ROG	CO	NO <sub>x</sub>	SO <sub>x</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	CO <sub>2</sub> eqv
Type	Category	BHP	lbs/unit	lbs/unit	lbs/unit	lbs/unit	lbs/unit	lbs/unit	lbs/unit	lbs/unit	lbs/unit	lbs/unit
Backhoe (Deere 410J)	offroad	98	0.247320	0.653237	0.531722	0.000630	0.056706	0.052170	48.764048	0.022315	0.009918	52.212996
Lowboy tractor and Trailer( Intern. Paystar 5900 FSA)	onroad HHD		0.002528	0.010215	0.030924	0.000040	0.001496	0.001294	4.215908	0.000117	0.000110	4.251047
<b>South Fork Long Canyon Diversion Dam Modification</b>												
Pickup Truck (Workers)	onroad LD		0.000796	0.007655	0.000776	0.000011	0.000090	0.000057	1.1	0.000072	0.000029	1.1
Oversize load tractor trailer (5 axles or more)	onroad HHD		0.002528	0.010215	0.030924	0.000040	0.001496	0.001294	4.2	0.000117	0.000110	4.3
Excavator (Deere 160 D LC)	offroad	121	0.118276	0.521969	0.729971	0.000864	0.065748	0.060488	73.623101	0.010672	0.004743	75.272489
Bulldozer (Deere Model 700J)	offroad	115	0.136629	0.479374	0.773334	0.000740	0.069758	0.064177	62.886944	0.012328	0.005479	64.792277
Forklift (Case 586G Series 3)	offroad	80	0.050308	0.190227	0.214308	0.000265	0.019667	0.018094	21.766075	0.004539	0.002017	22.467639
Flatbed Utility Truck (Ford F-650 XL)	onroad MD		0.002238	0.015457	0.017324	0.000027	0.000650	0.000550	2.766284	0.000107	0.000166	2.817856
Excavator (Deere 160 D LC)	offroad	121	0.118276	0.521969	0.729971	0.000864	0.065748	0.060488	73.623101	0.010672	0.004743	75.272489
Bulldozer (Deere Model 700J)	offroad	115	0.136629	0.479374	0.773334	0.000740	0.069758	0.064177	62.886944	0.012328	0.005479	64.792277
Forklift (Case 586G Series 3)	offroad	80	0.050308	0.190227	0.214308	0.000265	0.019667	0.018094	21.766075	0.004539	0.002017	22.467639
Flatbed Utility Truck or Dump (Ford F-650 XL)	onroad MD		0.002238	0.015457	0.017324	0.000027	0.000650	0.000550	2.766284	0.000107	0.000166	2.817856
Compressor (Sullair 375 H-AF trailer mounted)	Offroad	130	0.093564	0.361167	0.599164	0.000632	0.049604	0.045636	54.501661	0.008442	0.003752	55.806445
Generator Magnum MMG25 23KVA Diesel	Offroad	30	0.041280	0.130748	0.189856	0.000258	0.012786	0.011763	20.229730	0.003725	0.001655	20.805394
Mobile Crane (Link-Belt RTC-8030 Series II)	offroad	164	0.106718	0.460043	0.777617	0.000841	0.049024	0.045102	74.305267	0.009629	0.004280	75.793487
Concrete Transport Truck (assume F650 XL)	onroad HHD		0.002528	0.010215	0.030924	0.000040	0.001496	0.001294	4.215908	0.000117	0.000110	4.251047
Concrete Pumpers (Schwing SP 260)	Offroad	68	0.029343	0.085197	0.154833	0.000223	0.009058	0.008333	17.556175	0.002648	0.001177	17.965377
Lowboy tractor and Trailer ( Intern. Paystar 5900 FSA)	onroad HHD		0.002528	0.010215	0.030924	0.000040	0.001496	0.001294	4.215908	0.000117	0.000110	4.251047
Forklift (Case 586G Series 3)	offroad	80	0.050308	0.190227	0.214308	0.000265	0.019667	0.018094	21.766075	0.004539	0.002017	22.467639
Flatbed Utility Truck or Dump (Ford F-650 XL)	onroad MD		0.002238	0.015457	0.017324	0.000027	0.000650	0.000550	2.766284	0.000107	0.000166	2.817856
Backhoe (Deere 410J)	offroad	98	0.247320	0.653237	0.531722	0.000630	0.056706	0.052170	48.764048	0.022315	0.009918	52.212996
Lowboy tractor and Trailer(Paystar 5900 FSA)	onroad HHD		0.002528	0.010215	0.030924	0.000040	0.001496	0.001294	4.215908	0.000117	0.000110	4.251047
<b>OUTLET WORKS MODIFICATIONS</b>												
<b>Hell Hole Outlet Works Modification</b>												
Pickup Truck (Workers)	onroad LD		0.000796	0.007655	0.000776	0.000011	0.000090	0.000057	1.1	0.000072	0.000029	1.1
Excavator (Deere 160 D LC)	offroad	121	0.118276	0.521969	0.729971	0.000864	0.065748	0.060488	73.623101	0.010672	0.004743	75.272489
Forklift (Case 586G Series 3)	offroad	80	0.050308	0.190227	0.214308	0.000265	0.019667	0.018094	21.766075	0.004539	0.002017	22.467639
Flatbed Utility Truck (Ford F-650 XL)	onroad MD		0.002238	0.015457	0.017324	0.000027	0.000650	0.000550	2.766284	0.000107	0.000166	2.817856
Excavator (Deere 160 D LC)	offroad	121	0.118276	0.521969	0.729971	0.000864	0.065748	0.060488	73.623101	0.010672	0.004743	75.272489
Bulldozer (Deere Model 700J)	offroad	115	0.136629	0.479374	0.773334	0.000740	0.069758	0.064177	62.886944	0.012328	0.005479	64.792277
Forklift (Case 586G Series 3)	offroad	80	0.050308	0.190227	0.214308	0.000265	0.019667	0.018094	21.766075	0.004539	0.002017	22.467639
Flatbed Utility Truck or Dump (Ford F-650 XL)	onroad MD		0.002238	0.015457	0.017324	0.000027	0.000650	0.000550	2.766284	0.000107	0.000166	2.817856
Backhoe (Deere 410J) with Hoe ram breaker	offroad MD	98	0.247320	0.653237	0.531722	0.000630	0.056706	0.052170	48.764048	0.022315	0.009918	52.212996
Compressor (Sullair 375 H-AF trailer mounted)	Offroad	130	0.093564	0.361167	0.599164	0.000632	0.049604	0.045636	54.501661	0.008442	0.003752	55.806445
Mobile Crane (Link-Belt RTC-8030 Series II)	Off Road	164	0.106718	0.460043	0.777617	0.000841	0.049024	0.045102	74.305267	0.009629	0.004280	75.793487
Concrete Transport Truck (assume F650 XL)	onroad HHD		0.002528	0.010215	0.030924	0.000040	0.001496	0.001294	4.215908	0.000117	0.000110	4.251047
Concrete Pumpers (Schwing SP 260)	offroad	68	0.029343	0.085197	0.154833	0.000223	0.009058	0.008333	17.556175	0.002648	0.001177	17.965377
Lowboy tractor and Trailer (Paystar 5900 FSA)	onroad HHD		0.002528	0.010215	0.030924	0.000040	0.001496	0.001294	4.215908	0.000117	0.000110	4.251047
Forklift (Case 586G Series 3)	offroad	80	0.050308	0.190227	0.214308	0.000265	0.019667	0.018094	21.766075	0.004539	0.002017	22.467639
Flatbed Utility Truck or Dump (Ford F-650 XL)	onroad MD		0.002238	0.015457	0.017324	0.000027	0.000650	0.000550	2.766284	0.000107	0.000166	2.817856

Table 7. Estimated Emission Factors.

Equipment and Vehicles		Rating	ROG	CO	NO <sub>x</sub>	SO <sub>x</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	CO <sub>2</sub> eqv
Type	Category	BHP	lbs/unit	lbs/unit	lbs/unit	lbs/unit	lbs/unit	lbs/unit	lbs/unit	lbs/unit	lbs/unit	lbs/unit
Backhoe (Deere 410J)	offroad	98	0.247320	0.653237	0.531722	0.000630	0.056706	0.052170	48.764048	0.022315	0.009918	52.212996
Lowboy tractor and Trailer( Intern. Paystar 5900 FSA)	onroad HHD		0.002528	0.010215	0.030924	0.000040	0.001496	0.001294	4.215908	0.000117	0.000110	4.251047
<b>French Meadows Outlet Works Modification</b>												
Pickup Truck (Workers)	onroad LD		0.000796	0.007655	0.000776	0.000011	0.000090	0.000057	1.1	0.000072	0.000029	1.1
Oversize load tractor trailer (5 axles or more)	onroad HHD		0.002528	0.010215	0.030924	0.000040	0.001496	0.001294	4.215908	0.000117	0.000110	4.251047
Backhoe (Deere 410J)	offroad	98	0.247320	0.653237	0.531722	0.000630	0.056706	0.052170	48.764048	0.022315	0.009918	52.212996
Flatbed Utility Truck (Ford F-650 XL)	onroad MD		0.002238	0.015457	0.017324	0.000027	0.000650	0.000550	2.766284	0.000107	0.000166	2.817856
Backhoe (Deere 410J) with Hoe ram breaker	offroad	98	0.247320	0.653237	0.531722	0.000630	0.056706	0.052170	48.764048	0.022315	0.009918	52.212996
Flatbed Utility Truck or Dump (Ford F-650 XL)	onroad MD		0.002238	0.015457	0.017324	0.000027	0.000650	0.000550	2.766284	0.000107	0.000166	2.817856
Welder Hobart Champion elite	offroad	23	0.070310	0.215039	0.270171	0.000317	0.024305	0.022360	25.602678	0.006344	0.002820	26.583175
Generator Magnum MMG25 23KVA Diesel	offroad	30	0.041280	0.130748	0.189856	0.000258	0.012786	0.011763	20.229730	0.003725	0.001655	20.805394
Mobile Crane (Link-Belt RTC-8030 Series II)	offroad	164	0.106718	0.460043	0.777617	0.000841	0.049024	0.045102	74.305267	0.009629	0.004280	75.793487
Concrete Transport Truck (assume F650 XL)	onroad HHD		0.002528	0.010215	0.030924	0.000040	0.001496	0.001294	4.215908	0.000117	0.000110	4.251047
Concrete Pumper (Schwing SP 260)	offroad	68	0.029343	0.085197	0.154833	0.000223	0.009058	0.008333	17.556175	0.002648	0.001177	17.965377
Lowboy tractor and Trailer (Paystar 5900 FSA)	Onroad HHD		0.002528	0.010215	0.030924	0.000040	0.001496	0.001294	4.215908	0.000117	0.000110	4.251047
Flatbed Utility Truck or Dump (Ford F-650 XL)	onroad MD		0.002238	0.015457	0.017324	0.000027	0.000650	0.000550	2.766284	0.000107	0.000166	2.817856
Backhoe (Deere 410J)	offroad	98	0.247320	0.653237	0.531722	0.000630	0.056706	0.052170	48.764048	0.022315	0.009918	52.212996
Lowboy tractor and Trailer(Paystar 5900 FSA)	onroad HHD		0.002528	0.010215	0.030924	0.000040	0.001496	0.001294	4.215908	0.000117	0.000110	4.251047
<b>Middle Fork Interbay Outlet Works Modification</b>												
Pickup Truck (Workers)	onroad LD		0.000796	0.007655	0.000776	0.000011	0.000090	0.000057	1.1	0.000072	0.000029	1.1
Oversize load tractor trailer (5 axles or more)	onroad HHD		0.002528	0.010215	0.030924	0.000040	0.001496	0.001294	4.215908	0.000117	0.000110	4.251047
Backhoe (Deere 410J)	offroad	98	0.247320	0.653237	0.531722	0.000630	0.056706	0.052170	48.764048	0.022315	0.009918	52.212996
Flatbed Utility Truck (Ford F-650 XL)	onroad MD		0.002238	0.015457	0.017324	0.000027	0.000650	0.000550	2.766284	0.000107	0.000166	2.817856
Backhoe (Deere 410J) with Hoe ram breaker	offroad	98	0.247320	0.653237	0.531722	0.000630	0.056706	0.052170	48.764048	0.022315	0.009918	52.212996
Flatbed Utility Truck or Dump (Ford F-650 XL)	onroad MD		0.002238	0.015457	0.017324	0.000027	0.000650	0.000550	2.766284	0.000107	0.000166	2.817856
Welder Hobart Champion elite	offroad	23	0.070310	0.215039	0.270171	0.000317	0.024305	0.022360	25.602678	0.006344	0.002820	26.583175
Generator Magnum MMG25 23KVA Diesel	offroad	30	0.041280	0.130748	0.189856	0.000258	0.012786	0.011763	20.229730	0.003725	0.001655	20.805394
Mobile Crane (Link-Belt RTC-8030 Series II)	offroad	164	0.106718	0.460043	0.777617	0.000841	0.049024	0.045102	74.305267	0.009629	0.004280	75.793487
Concrete Transport Truck (assume F650 XL)	onroad HHD		0.002528	0.010215	0.030924	0.000040	0.001496	0.001294	4.215908	0.000117	0.000110	4.251047
Concrete Pumper (Schwing SP 260)	offroad	68	0.029343	0.085197	0.154833	0.000223	0.009058	0.008333	17.556175	0.002648	0.001177	17.965377
Lowboy tractor and Trailer (Paystar 5900 FSA)	Onroad HHD		0.002528	0.010215	0.030924	0.000040	0.001496	0.001294	4.215908	0.000117	0.000110	4.251047
Flatbed Utility Truck or Dump (Ford F-650 XL)	onroad MD		0.002238	0.015457	0.017324	0.000027	0.000650	0.000550	2.766284	0.000107	0.000166	2.817856
Backhoe (Deere 410J)	offroad	98	0.247320	0.653237	0.531722	0.000630	0.056706	0.052170	48.764048	0.022315	0.009918	52.212996
Lowboy tractor and Trailer(Paystar 5900 FSA)	onroad HHD		0.002528	0.010215	0.030924	0.000040	0.001496	0.001294	4.215908	0.000117	0.000110	4.251047
<b>HELL HOLE RESERVOIR SEASONAL STORAGE INCREASE IMPROVEMENT</b>												
Pickup Truck (Workers)	onroad LD		0.000796	0.007655	0.000776	0.000011	0.000090	0.000057	1.1	0.000072	0.000029	1.1
Oversize load tractor trailer (5 axles or more)	onroad HHD		0.002528	0.010215	0.030924	0.000040	0.001496	0.001294	4.215908	0.000117	0.000110	4.251047
Front Loader (Deere 444 K)	offroad	117	0.134099	0.526997	0.799364	0.000857	0.072075	0.066309	72.9	0.012100	0.005378	74.8
Flatbed Utility Truck or Dump (Ford F-650 XL)	onroad MD		0.002238	0.015457	0.017324	0.000027	0.000650	0.000550	2.766284	0.000107	0.000166	2.817856
Backhoe (Deere 410J)	offroad MD	98	0.247320	0.653237	0.531722	0.000630	0.056706	0.052170	48.764048	0.022315	0.009918	52.212996
Compressor (Sullair 375 H-AF trailer mounted)	onroad MD	130	0.093564	0.361167	0.599164	0.000632	0.049604	0.045636	54.501661	0.008442	0.003752	55.806445

Table 7. Estimated Emission Factors.

Equipment and Vehicles		Rating	ROG	CO	NO <sub>x</sub>	SO <sub>x</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	CO <sub>2</sub> eqv
Type	Category	BHP	lbs/unit	lbs/unit	lbs/unit	lbs/unit	lbs/unit	lbs/unit	lbs/unit	lbs/unit	lbs/unit	lbs/unit
Flatbed Utility Truck or Dump (Ford F-650 XL)	onroad MD		0.002238	0.015457	0.017324	0.000027	0.000650	0.000550	2.766284	0.000107	0.000166	2.817856
Lowboy tractor and Trailer ( Intern. Paystar 5900 FSA)	onroad HHD		0.002528	0.010215	0.030924	0.000040	0.001496	0.001294	4.215908	0.000117	0.000110	4.251047
Backhoe (Deere 410J) (Ramhoe attachment)	offroad	98	0.247320	0.653237	0.531722	0.000630	0.056706	0.052170	48.764048	0.022315	0.009918	52.212996
Electrical Boom Type Line Truck (Ford F-650 XL)	onroad MD	325	0.182357	0.647902	1.504564	0.002026	0.064144	0.059012	194.536912	0.016454	0.007313	197.079930
Generator Magnum MMG25 23KVA Diesel	offroad	30	0.041280	0.130748	0.189856	0.000258	0.012786	0.011763	20.229730	0.003725	0.001655	20.805394
Mobile Crane (Link-Belt RTC-8030 Series II)	offroad	164	0.106718	0.460043	0.777617	0.000841	0.049024	0.045102	74.305267	0.009629	0.004280	75.793487
Concrete Transport Truck (assume F650 XL)	onroad HHD		0.002528	0.010215	0.030924	0.000040	0.001496	0.001294	4.215908	0.000117	0.000110	4.251047
Concrete Pumpers (Schwing SP 260)	offroad	68	0.029343	0.085197	0.154833	0.000223	0.009058	0.008333	17.556175	0.002648	0.001177	17.965377
Forklift (Case 586G Series 3)	offroad	80	0.050308	0.190227	0.214308	0.000265	0.019667	0.018094	21.766075	0.004539	0.002017	22.467639
Backhoe (Deere 410J)	offroad	98	0.247320	0.653237	0.531722	0.000630	0.056706	0.052170	48.764048	0.022315	0.009918	52.212996
Flatbed Utility Truck or Dump (Ford F-650 XL)	onroad MD		0.002238	0.015457	0.017324	0.000027	0.000650	0.000550	2.766284	0.000107	0.000166	2.817856
Forklift (Case 586G Series 3)	offroad	80	0.050308	0.190227	0.214308	0.000265	0.019667	0.018094	21.766075	0.004539	0.002017	22.467639
Generator Magnum MMG25 23KVA Diesel	offroad	30	0.041280	0.130748	0.189856	0.000258	0.012786	0.011763	20.229730	0.003725	0.001655	20.805394
Lowboy tractor and Trailer (Intern. Paystar 5900 FSA)	onroad HHD		0.002528	0.010215	0.030924	0.000040	0.001496	0.001294	4.215908	0.000117	0.000110	4.251047

Sources: SCAQMD 2008, EPA 2009

Table 8. Estimated Daily Emissions for Proposed Project.

Equipment and Vehicles		Daily Activity		ROG	CO	NO <sub>x</sub>	SO <sub>x</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	CO <sub>2</sub> eqv
Type	Category	hours	VMT	lbs	lbs	lbs	lbs	lbs	lbs	lbs	lbs	lbs	lbs
<b>SMALL DIVERSION MODIFICATIONS</b>													
<b>Duncan Creek Diversion Dam Modification</b>													
Pickup Truck (Workers)	onroad LD		1200	0.96	9.19	0.93	0.01	0.11	0.07	1,322	0.09	0.03	1,334
Oversize Load Tractor Trailer (5 axles or more)	onroad HHD		120	0.30	1.23	3.71	0.00	0.18	0.16	506	0.01	0.01	510
Excavator (Deere 160 D LC)	offroad	5		0.59	2.61	3.65	0.00	0.33	0.30	368	0.05	0.02	376
Bulldozer (Deere Model 700J)	offroad	5		0.68	2.40	3.87	0.00	0.35	0.32	314	0.06	0.03	324
Forklift (Case 586G Series 3)	offroad	2		0.10	0.38	0.43	0.00	0.04	0.04	44	0.01	0.00	45
Flatbed Utility Truck (Ford F-650 XL)	onroad MD		150	0.34	2.32	2.60	0.00	0.10	0.08	415	0.02	0.02	423
Excavator (Deere 160 D LC)	offroad	6		0.71	3.13	4.38	0.01	0.39	0.36	442	0.06	0.03	452
Bulldozer (Deere Model 700J)	offroad	6		0.82	2.88	4.64	0.00	0.42	0.39	377	0.07	0.03	389
Forklift (Case 586G Series 3)	offroad	2		0.10	0.38	0.43	0.00	0.04	0.04	44	0.01	0.00	45
Flatbed Utility Truck or Dump (Ford F-650 XL)	onroad MD		150	0.34	2.32	2.60	0.00	0.10	0.08	415	0.02	0.02	423
Compressor (Sullair 375 H-AF trailer mounted)	Offroad	6		0.56	2.17	3.59	0.00	0.30	0.27	327	0.05	0.02	335
Generator Magnum MMG25 23KVA Diesel	Offroad	10		0.41	1.31	1.90	0.00	0.13	0.12	202	0.04	0.02	208
Mobile Crane (Link-Belt RTC-8030 Series II)	offroad	5		0.53	2.30	3.89	0.00	0.25	0.23	372	0.05	0.02	379
Concrete Transport Truck (assume F650 XL)	onroad HHD		1200	3.03	12.26	37.11	0.05	1.79	1.55	5,059	0.14	0.13	5,101
Concrete Pumpers (Schwing SP 260)	Offroad	4		0.12	0.34	0.62	0.00	0.04	0.03	70	0.01	0.00	72
Lowboy tractor and Trailer ( Intern. Paystar 5900 FSA)	onroad HHD		150	0.38	1.53	4.64	0.01	0.22	0.19	632	0.02	0.02	638
Forklift (Case 586G Series 3)	offroad	4		0.20	0.76	0.86	0.00	0.08	0.07	87	0.02	0.01	90
Flatbed Utility Truck or Dump (Ford F-650 XL)	onroad MD		150	0.34	2.32	2.60	0.00	0.10	0.08	415	0.02	0.02	423
Backhoe (Deere 410J)	offroad	4		0.99	2.61	2.13	0.00	0.23	0.21	195	0.09	0.04	209
Lowboy tractor and Trailer( Intern. Paystar 5900 FSA)	onroad HHD		150	0.38	1.53	4.64	0.01	0.22	0.19	632	0.02	0.02	638
<b>North Fork Long Canyon Diversion Dam Modification</b>													
Pickup Truck (Workers)	onroad LD		1200	0.96	9.19	0.93	0.01	0.11	0.07	1,322	0.09	0.03	1,334
Oversize Load Tractor Trailer (5 axles or more)	onroad HHD		120	0.30	1.23	3.71	0.00	0.18	0.16	506	0.01	0.01	510
Excavator (Deere 160 D LC)	offroad	5		0.59	2.61	3.65	0.00	0.33	0.30	368	0.05	0.02	376
Bulldozer (Deere Model 700J)	offroad	5		0.68	2.40	3.87	0.00	0.35	0.32	314	0.06	0.03	324
Forklift (Case 586G Series 3)	offroad	2		0.10	0.38	0.43	0.00	0.04	0.04	44	0.01	0.00	45
Flatbed Utility Truck (Ford F-650 XL)	onroad MD		150	0.34	2.32	2.60	0.00	0.10	0.08	415	0.02	0.02	423
Excavator (Deere 160 D LC)	offroad	6		0.71	3.13	4.38	0.01	0.39	0.36	442	0.06	0.03	452
Bulldozer (Deere Model 700J)	offroad	6		0.82	2.88	4.64	0.00	0.42	0.39	377	0.07	0.03	389
Forklift (Case 586G Series 3)	offroad	2		0.10	0.38	0.43	0.00	0.04	0.04	44	0.01	0.00	45
Flatbed Utility Truck or Dump (Ford F-650 XL)	onroad MD		150	0.34	2.32	2.60	0.00	0.10	0.08	415	0.02	0.02	423
Compressor (Sullair 375 H-AF trailer mounted)	Offroad	6		0.56	2.17	3.59	0.00	0.30	0.27	327	0.05	0.02	335
Generator Magnum MMG25 23KVA Diesel	Offroad	10		0.41	1.31	1.90	0.00	0.13	0.12	202	0.04	0.02	208
Mobile Crane (Link-Belt RTC-8030 Series II)	offroad	5		0.53	2.30	3.89	0.00	0.25	0.23	372	0.05	0.02	379
Concrete Transport Truck (assume F650 XL)	onroad HHD		1200	3.03	12.26	37.11	0.05	1.79	1.55	5,059	0.14	0.13	5,101
Concrete Pumpers (Schwing SP 260)	Offroad	4		0.12	0.34	0.62	0.00	0.04	0.03	70	0.01	0.00	72
Lowboy tractor and Trailer ( Intern. Paystar 5900 FSA)	onroad HHD		150	0.38	1.53	4.64	0.01	0.22	0.19	632	0.02	0.02	638
Forklift (Case 586G Series 3)	offroad	4		0.20	0.76	0.86	0.00	0.08	0.07	87	0.02	0.01	90

Table 8. Estimated Daily Emissions for Proposed Project.

Equipment and Vehicles		Daily Activity		ROG	CO	NO <sub>x</sub>	SO <sub>x</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	CO <sub>2</sub> eqv
Type	Category	hours	VMT	lbs	lbs	lbs	lbs	lbs	lbs	lbs	lbs	lbs	lbs
Flatbed Utility Truck or Dump (Ford F-650 XL)	onroad MD		150	0.34	2.32	2.60	0.00	0.10	0.08	415	0.02	0.02	423
Backhoe (Deere 410J)	offroad	4		0.99	2.61	2.13	0.00	0.23	0.21	195	0.09	0.04	209
Lowboy tractor and Trailer( Intern. Paystar 5900 FSA)	onroad HHD		150	0.38	1.53	4.64	0.01	0.22	0.19	632	0.02	0.02	638
<b>South Fork Long Canyon Diversion Dam Modification</b>													
Pickup Truck (Workers)	onroad LD		1200	0.96	9.19	0.93	0.01	0.11	0.07	1,322	0.09	0.03	1,334
Oversize Load Tractor Trailer (5 axles or more)	onroad HHD		120	0.30	1.23	3.71	0.00	0.18	0.16	506	0.01	0.01	510
Excavator (Deere 160 D LC)	offroad	5		0.59	2.61	3.65	0.00	0.33	0.30	368	0.05	0.02	376
Bulldozer (Deere Model 700J)	offroad	5		0.68	2.40	3.87	0.00	0.35	0.32	314	0.06	0.03	324
Forklift (Case 586G Series 3)	offroad	2		0.10	0.38	0.43	0.00	0.04	0.04	44	0.01	0.00	45
Flatbed Utility Truck (Ford F-650 XL)	onroad MD		150	0.34	2.32	2.60	0.00	0.10	0.08	415	0.02	0.02	423
Excavator (Deere 160 D LC)	offroad	6		0.71	3.13	4.38	0.01	0.39	0.36	442	0.06	0.03	452
Bulldozer (Deere Model 700J)	offroad	6		0.82	2.88	4.64	0.00	0.42	0.39	377	0.07	0.03	389
Forklift (Case 586G Series 3)	offroad	2		0.10	0.38	0.43	0.00	0.04	0.04	44	0.01	0.00	45
Flatbed Utility Truck or Dump (Ford F-650 XL)	onroad MD		150	0.34	2.32	2.60	0.00	0.10	0.08	415	0.02	0.02	423
Compressor (Sullair 375 H-AF trailer mounted)	Offroad	6		0.56	2.17	3.59	0.00	0.30	0.27	327	0.05	0.02	335
Generator Magnum MMG25 23KVA Diesel	Offroad	10		0.41	1.31	1.90	0.00	0.13	0.12	202	0.04	0.02	208
Mobile Crane (Link-Belt RTC-8030 Series II)	offroad	5		0.53	2.30	3.89	0.00	0.25	0.23	372	0.05	0.02	379
Concrete Transport Truck (assume F650 XL)	onroad HHD		1200	3.03	12.26	37.11	0.05	1.79	1.55	5,059	0.14	0.13	5,101
Concrete Pumpers (Schwing SP 260)	Offroad	4		0.12	0.34	0.62	0.00	0.04	0.03	70	0.01	0.00	72
Lowboy tractor and Trailer ( Intern. Paystar 5900 FSA)	onroad HHD		150	0.38	1.53	4.64	0.01	0.22	0.19	632	0.02	0.02	638
Forklift (Case 586G Series 3)	offroad	4		0.20	0.76	0.86	0.00	0.08	0.07	87	0.02	0.01	90
Flatbed Utility Truck or Dump (Ford F-650 XL)	onroad MD		150	0.34	2.32	2.60	0.00	0.10	0.08	415	0.02	0.02	423
Backhoe (Deere 410J)	offroad	4		0.99	2.61	2.13	0.00	0.23	0.21	195	0.09	0.04	209
Lowboy tractor and Trailer( Intern. Paystar 5900 FSA)	onroad HHD		150	0.38	1.53	4.64	0.01	0.22	0.19	632	0.02	0.02	638
<b>OUTLET WORKS MODIFICATIONS</b>													
<b>Hell Hole Outlet Works Modification</b>													
Pickup Truck (Workers)	onroad LD		1200	0.96	9.19	0.93	0.01	0.11	0.07	1,322	0.09	0.03	1,334
Excavator (Deere 160 D LC)	offroad	5		0.59	2.61	3.65	0.00	0.33	0.30	368	0.05	0.02	376
Forklift (Case 586G Series 3)	offroad	2		0.10	0.38	0.43	0.00	0.04	0.04	44	0.01	0.00	45
Flatbed Utility Truck (Ford F-650 XL)	onroad MD		150	0.34	2.32	2.60	0.00	0.10	0.08	415	0.02	0.02	423
Excavator (Deere 160 D LC)	offroad	6		0.71	3.13	4.38	0.01	0.39	0.36	442	0.06	0.03	452
Bulldozer (Deere Model 700J)	offroad	6		0.82	2.88	4.64	0.00	0.42	0.39	377	0.07	0.03	389
Forklift (Case 586G Series 3)	offroad	2		0.10	0.38	0.43	0.00	0.04	0.04	44	0.01	0.00	45
Flatbed Utility Truck or Dump (Ford F-650 XL)	onroad MD		150	0.34	2.32	2.60	0.00	0.10	0.08	415	0.02	0.02	423
Backhoe (Deere 410J) with Hoe ram breaker	offroad	4		0.99	2.61	2.13	0.00	0.23	0.21	195	0.09	0.04	209
Compressor (Sullair 375 H-AF trailer mounted)	Offroad	6		0.56	2.17	3.59	0.00	0.30	0.27	327	0.05	0.02	335
Mobile Crane (Link-Belt RTC-8030 Series II)	Off Road	5		0.53	2.30	3.89	0.00	0.25	0.23	372	0.05	0.02	379
Concrete Transport Truck (assume F650 XL)	onroad HHD		150	0.38	1.53	4.64	0.01	0.22	0.19	632	0.02	0.02	638
Concrete Pumpers (Schwing SP 260)	offroad		0	0.00	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	0
Lowboy tractor and Trailer (Paystar 5900 FSA)	onroad HHD		150	0.38	1.53	4.64	0.01	0.22	0.19	632	0.02	0.02	638



Table 8. Estimated Daily Emissions for Proposed Project.

Equipment and Vehicles		Daily Activity		ROG	CO	NO <sub>x</sub>	SO <sub>x</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	CO <sub>2</sub> eqv
Type	Category	hours	VMT	lbs	lbs	lbs	lbs	lbs	lbs	lbs	lbs	lbs	lbs
Forklift (Case 586G Series 3)	offroad	4		0.20	0.76	0.86	0.00	0.08	0.07	87	0.02	0.01	90
Flatbed Utility Truck or Dump (Ford F-650 XL)	onroad MD		150	0.34	2.32	2.60	0.00	0.10	0.08	415	0.02	0.02	423
Backhoe (Deere 410J)	offroad	4		0.99	2.61	2.13	0.00	0.23	0.21	195	0.09	0.04	209
Lowboy tractor and Trailer( Intern. Paystar 5900 FSA)	onroad HHD		150	0.38	1.53	4.64	0.01	0.22	0.19	632	0.02	0.02	638
<b>French Meadows Outlet Works Modification</b>													
Pickup Truck (Workers)	onroad LD		480	0.38	3.67	0.37	0.01	0.04	0.03	529	0.03	0.01	534
Oversize load tractor trailer (5 axles or more)	onroad HHD		120	0.30	1.23	3.71	0.00	0.18	0.16	506	0.01	0.01	510
Backhoe (Deere 410J)	offroad	3		0.74	1.96	1.60	0.00	0.17	0.16	146	0.07	0.03	157
Flatbed Utility Truck (Ford F-650 XL)	onroad MD		150	0.34	2.32	2.60	0.00	0.10	0.08	415	0.02	0.02	423
Backhoe (Deere 410J) with Hoe ram breaker	offroad	2		0.49	1.31	1.06	0.00	0.11	0.10	98	0.04	0.02	104
Flatbed Utility Truck or Dump (Ford F-650 XL)	onroad MD		150	0.34	2.32	2.60	0.00	0.10	0.08	415	0.02	0.02	423
Welder Hobart Champion elite	offroad	4		0.28	0.86	1.08	0.00	0.10	0.09	102	0.03	0.01	106
Generator Magnum MMG25 23KVA Diesel	offroad	8		0.33	1.05	1.52	0.00	0.10	0.09	162	0.03	0.01	166
Mobile Crane (Link-Belt RTC-8030 Series II)	offroad	4		0.43	1.84	3.11	0.00	0.20	0.18	297	0.04	0.02	303
Concrete Transport Truck (assume F650 XL)	onroad HHD		150	0.38	1.53	4.64	0.01	0.22	0.19	632	0.02	0.02	638
Concrete Pumper (Schwing SP 260)	offroad	4		0.12	0.34	0.62	0.00	0.04	0.03	70	0.01	0.00	72
Lowboy tractor and Trailer (Paystar 5900 FSA)	Onroad HHD		150	0.38	1.53	4.64	0.01	0.22	0.19	632	0.02	0.02	638
Flatbed Utility Truck or Dump (Ford F-650 XL)	onroad MD		150	0.34	2.32	2.60	0.00	0.10	0.08	415	0.02	0.02	423
Backhoe (Deere 410J)	offroad	4		0.99	2.61	2.13	0.00	0.23	0.21	195	0.09	0.04	209
Lowboy tractor and Trailer(Paystar 5900 FSA)	onroad HHD		150	0.38	1.53	4.64	0.01	0.22	0.19	632	0.02	0.02	638
<b>Middle Fork Interbay Outlet Works Modification</b>													
Pickup Truck (Workers)	onroad LD		480	0.38	3.67	0.37	0.01	0.04	0.03	529	0.03	0.01	534
Oversize load tractor trailer (5 axles or more)	onroad HHD		120	0.30	1.23	3.71	0.00	0.18	0.16	506	0.01	0.01	510
Backhoe (Deere 410J)	offroad	3		0.74	1.96	1.60	0.00	0.17	0.16	146	0.07	0.03	157
Flatbed Utility Truck (Ford F-650 XL)	onroad MD		150	0.34	2.32	2.60	0.00	0.10	0.08	415	0.02	0.02	423
Backhoe (Deere 410J) with Hoe ram breaker	offroad	4		0.99	2.61	2.13	0.00	0.23	0.21	195	0.09	0.04	209
Flatbed Utility Truck or Dump (Ford F-650 XL)	onroad MD		150	0.34	2.32	2.60	0.00	0.10	0.08	415	0.02	0.02	423
Welder Hobart Champion elite	offroad	5		0.35	1.08	1.35	0.00	0.12	0.11	128	0.03	0.01	133
Generator Magnum MMG25 23KVA Diesel	offroad	8		0.33	1.05	1.52	0.00	0.10	0.09	162	0.03	0.01	166
Mobile Crane (Link-Belt RTC-8030 Series II)	offroad	4		0.43	1.84	3.11	0.00	0.20	0.18	297	0.04	0.02	303
Concrete Transport Truck (assume F650 XL)	onroad HHD		150	0.38	1.53	4.64	0.01	0.22	0.19	632	0.02	0.02	638
Concrete Pumper (Schwing SP 260)	offroad	4		0.12	0.34	0.62	0.00	0.04	0.03	70	0.01	0.00	72
Lowboy tractor and Trailer (Paystar 5900 FSA)	Onroad HHD		150	0.38	1.53	4.64	0.01	0.22	0.19	632	0.02	0.02	638
Flatbed Utility Truck or Dump (Ford F-650 XL)	onroad MD		150	0.34	2.32	2.60	0.00	0.10	0.08	415	0.02	0.02	423
Backhoe (Deere 410J)	offroad	4		0.99	2.61	2.13	0.00	0.23	0.21	195	0.09	0.04	209
Lowboy tractor and Trailer(Paystar 5900 FSA)	onroad HHD		150	0.38	1.53	4.64	0.01	0.22	0.19	632	0.02	0.02	638
<b>HELL HOLE RESERVOIR SEASONAL STORAGE INCREASE IMPROVEMENT</b>													
Pickup Truck (Workers)	onroad LD		1200	0.96	9.19	0.93	0.01	0.11	0.07	1,322	0.09	0.03	1,334
Oversize load tractor trailer (5 axles or more)	onroad HHD		120	0.30	1.23	3.71	0.00	0.18	0.16	506	0.01	0.01	510
Front Loader (Deere 444 K)	offroad	6		0.80	3.16	4.80	0.01	0.43	0.40	438	0.07	0.03	449



**Table 8. Estimated Daily Emissions for Proposed Project.**

Equipment and Vehicles		Daily Activity		ROG	CO	NO <sub>x</sub>	SO <sub>x</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	CO <sub>2</sub> eqv
Type	Category	hours	VMT	lbs	lbs	lbs	lbs	lbs	lbs	lbs	lbs	lbs	lbs
Flatbed Utility Truck or Dump (Ford F-650 XL)	onroad MD		100	0.22	1.55	1.73	0.00	0.06	0.05	277	0.01	0.02	282
Backhoe (Deere 410J)	offroad	6		1.48	3.92	3.19	0.00	0.34	0.31	293	0.13	0.06	313
Compressor (Sullair 375 H-AF trailer mounted)	offroad	6		0.56	2.17	3.59	0.00	0.30	0.27	327	0.05	0.02	335
Flatbed Utility Truck or Dump (Ford F-650 XL)	onroad MD		150	0.34	2.32	2.60	0.00	0.10	0.08	415	0.02	0.02	423
Lowboy tractor and Trailer ( Intern. Paystar 5900 FSA)	onroad HHD		150	0.38	1.53	4.64	0.01	0.22	0.19	632	0.02	0.02	638
Backhoe (Deere 410J) (Ramhoe attachment)	offroad	8		1.98	5.23	4.25	0.01	0.45	0.42	390	0.18	0.08	418
Electrical Boom Type Line Truck (Ford F-650 XL)	offroad	6		1.09	3.89	9.03	0.01	0.38	0.35	1,167	0.10	0.04	1,182
Generator Magnum MMG25 23KVA Diesel	offroad	10		0.41	1.31	1.90	0.00	0.13	0.12	202	0.04	0.02	208
Mobile Crane (Link-Belt RTC-8030 Series II)	offroad	6		0.64	2.76	4.67	0.01	0.29	0.27	446	0.06	0.03	455
Concrete Transport Truck (assume F650 XL)	onroad HHD		150	0.38	1.53	4.64	0.01	0.22	0.19	632	0.02	0.02	638
Concrete Pumpers (Schwing SP 260)	offroad	4		0.12	0.34	0.62	0.00	0.04	0.03	70	0.01	0.00	72
Forklift (Case 586G Series 3)	offroad	4		0.20	0.76	0.86	0.00	0.08	0.07	87	0.02	0.01	90
Backhoe (Deere 410J)	offroad	4		0.99	2.61	2.13	0.00	0.23	0.21	195	0.09	0.04	209
Flatbed Utility Truck or Dump (Ford F-650 XL)	onroad MD		150	0.34	2.32	2.60	0.00	0.10	0.08	415	0.02	0.02	423
Forklift (Case 586G Series 3)	offroad	4		0.20	0.76	0.86	0.00	0.08	0.07	87	0.02	0.01	90
Generator Magnum MMG25 23KVA Diesel	offroad	10		0.41	1.31	1.90	0.00	0.13	0.12	202	0.04	0.02	208
Lowboy tractor and Trailer( Intern. Paystar 5900 FSA)	onroad HHD		150	0.38	1.53	4.64	0.01	0.22	0.19	632	0.02	0.02	638
Sources: SCAQMD 2008, EPA 2009													
<b>CHECKSUM</b>		<b>356</b>	<b>17,080</b>										
<b>Daily Activity Emission in Pounds</b>		<b>hours</b>	<b>VMT</b>	<b>ROG</b>	<b>CO</b>	<b>NO<sub>x</sub></b>	<b>SO<sub>x</sub></b>	<b>PM<sub>10</sub></b>	<b>PM<sub>2.5</sub></b>	<b>CO<sub>2</sub></b>	<b>CH<sub>4</sub></b>	<b>N<sub>2</sub>O</b>	<b>CO<sub>2</sub> eqv</b>
Duncan Small Diversion		59	3,270	9	40	67	0	4	4	9,179	1	0	9,309
North Fork Long Canyon		59	3,270	9	40	67	0	4	4	9,179	1	0	9,309
South Fork Long Canyon		59	3,270	9	40	67	0	4	4	9,179	1	0	9,309
Hell Hole Outlet		44	2,100	7	30	37	0	3	2	5,185	1	0	5,283
French Meadow Outlet		29	1,500	5	20	28	0	2	1	3,935	0	0	4,007
Interbay Outlet		32	1,500	5	21	29	0	2	2	4,028	0	0	4,105
Hell Hole Seasonal Storage		74	2,170	9	37	47	0	3	3	6,552	1	0	6,685
<b>Maximum Daily Activity Emission, lbs</b>				<b>9</b>	<b>40</b>	<b>67</b>	<b>0</b>	<b>4</b>	<b>4</b>	<b>9,179</b>	<b>1</b>	<b>0</b>	<b>9,309</b>
<b>CHECKSUM</b>		<b>356</b>	<b>17,080</b>	<b>Duncan</b>	<b>NFLC</b>	<b>SFLC</b>	<b>HH Outlet</b>	<b>FM Outlet</b>	<b>IB Outlet</b>				<b>HH Store</b>
<b>Daily Maximums for Fugitive Dust Calcs</b>		<b>Total Hrs</b>	<b>Total VMT</b>	<b>Hrs</b>	<b>Hrs</b>	<b>Hrs</b>	<b>Hrs</b>	<b>Hrs</b>	<b>Hrs</b>				<b>Hrs</b>
Bulldozer		6		6	6	6	6	0	0				0
Grader		0		0	0	0	0	0	0				0
Excavator		6		6	6	6	6	0	0				0
Loader		6	100	0	0	0	0	0	0				6
Crusher		0		0	0	0	0	0	0				0
Screener		0		0	0	0	0	0	0				0
Articulated Dump Truck (ADT)		0		<b>Duncan</b>	<b>NFLC</b>	<b>SFLC</b>	<b>HH Outlet</b>	<b>FM Outlet</b>	<b>IB Outlet</b>				<b>HH Store</b>
Roller/Compactor		0		<b>VMT</b>	<b>VMT</b>	<b>VMT</b>	<b>VMT</b>	<b>VMT</b>	<b>VMT</b>				<b>VMT</b>
Light Duty (pickup trucks)			1,200	1,200	1,200	1,200	1,200	480	480				1,200
Medium Duty (work trucks)			150	150	150	150	150	150	150				150

**Table 8. Estimated Daily Emissions for Proposed Project.**

Equipment and Vehicles		Daily Activity		ROG	CO	NO <sub>x</sub>	SO <sub>x</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	CO <sub>2</sub> eqv
Type	Category	hours	VMT	lbs	lbs	lbs	lbs	lbs	lbs	lbs	lbs	lbs	lbs
Heavy Heavy Duty (tractor/trailers)			1,200	1,200	1,200	37	1,200	150	150		150		
Heavy Heavy Duty (water & quarry trucks)			0										
Articulated Dump Truck (ADT) @ 5 mph avg			0										

Notes

Maximum daily emissions assumes 75% of all equipment operating concurrently  
 SCAQMD emission factors for 2012 (Ref: SCAQMD 2008)  
 Offroad diesel exhaust PM2.5 = 92% of PM10 per EMFAC 2007 version 2.3  
 HHD includes tire & brake wear  
 Onroad N2O per Annex 3, Table A-99  
 Offroad N2O per Annex 3, Table A-101

**Table 9. Estimated Total Emissions for Proposed Project.**

Equipment and Vehicles		Project Activity		ROG	CO	NO <sub>x</sub>	SO <sub>x</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	CO <sub>2</sub> eqv
Type	Category	hours	VMT	lbs	lbs	lbs	lbs	lbs	lbs	lbs	lbs	lbs	lbs
<b>SMALL DIVERSION MODIFICATIONS</b>													
<b>Duncan Creek Diversion Dam Modification</b>													
Pickup Truck (Workers)	onroad LD		144,000	114.7	1,102.3	111.7	1.5	12.9	8.3	158,620	10.3	4.2	160,132
Oversize Load Tractor Trailer (5 axles or more)	onroad HHD		360	0.9	3.7	11.1	0.0	0.5	0.5	1,518	0.0	0.0	1,531
Excavator (Deere 160 D LC)	offroad	35		4.1	18.3	25.5	0.0	2.3	2.1	2,577	0.4	0.2	2,635
Bulldozer (Deere Model 700J)	offroad	35		4.8	16.8	27.1	0.0	2.4	2.2	2,201	0.4	0.2	2,268
Forklift (Case 586G Series 3)	offroad	28		1.4	5.3	6.0	0.0	0.6	0.5	609	0.1	0.1	629
Flatbed Utility Truck (Ford F-650 XL)	onroad MD		2,100	4.7	32.5	36.4	0.1	1.4	1.2	5,809	0.2	0.3	5,917
Excavator (Deere 160 D LC)	offroad	192		22.7	100.2	140.2	0.2	12.6	11.6	14,136	2.0	0.9	14,452
Bulldozer (Deere Model 700J)	offroad	144		19.7	69.0	111.4	0.1	10.0	9.2	9,056	1.8	0.8	9,330
Forklift (Case 586G Series 3)	offroad	40		2.0	7.6	8.6	0.0	0.8	0.7	871	0.2	0.1	899
Flatbed Utility Truck or Dump (Ford F-650 XL)	onroad MD		6,750	15.1	104.3	116.9	0.2	4.4	3.7	18,672	0.7	1.1	19,021
Compressor (Sullair 375 H-AF trailer mounted)	Offroad	120		11.2	43.3	71.9	0.1	6.0	5.5	6,540	1.0	0.5	6,697
Generator Magnum MMG25 23KVA Diesel	Offroad	400		16.5	52.3	75.9	0.1	5.1	4.7	8,092	1.5	0.7	8,322
Mobile Crane (Link-Belt RTC-8030 Series II)	offroad	105		11.2	48.3	81.6	0.1	5.1	4.7	7,802	1.0	0.4	7,958
Concrete Transport Truck (assume F650 XL)	onroad HHD		16,800	42.5	171.6	519.5	0.7	25.1	21.7	70,827	2.0	1.8	71,418
Concrete Pumps (Schwing SP 260)	Offroad	56		1.6	4.8	8.7	0.0	0.5	0.5	983	0.1	0.1	1,006
Lowboy tractor and Trailer ( Intern. Paystar 5900 FSA)	onroad HHD		1,200	3.0	12.3	37.1	0.0	1.8	1.6	5,059	0.1	0.1	5,101
Forklift (Case 586G Series 3)	offroad	60		3.0	11.4	12.9	0.0	1.2	1.1	1,306	0.3	0.1	1,348
Flatbed Utility Truck or Dump (Ford F-650 XL)	onroad MD		1,050	2.3	16.2	18.2	0.0	0.7	0.6	2,905	0.1	0.2	2,959
Backhoe (Deere 410J)	offroad	60		14.8	39.2	31.9	0.0	3.4	3.1	2,926	1.3	0.6	3,133
Lowboy tractor and Trailer( Intern. Paystar 5900 FSA)	onroad HHD	10	300	0.0	0.1	0.3	10.0	0.0	0.0	42	0.0	0.0	43
<b>North Fork Long Canyon Diversion Dam Modification</b>													
Pickup Truck (Workers)	onroad LD		144,000	114.7	1,102.3	111.7	1.5	12.9	8.3	158,620	10.3	4.2	160,132
Oversize Load Tractor Trailer (5 axles or more)	onroad HHD		360	0.9	3.7	11.1	0.0	0.5	0.5	1,518	0.0	0.0	1,531
Excavator (Deere 160 D LC)	offroad	35		4.1	18.3	25.5	0.0	2.3	2.1	2,577	0.4	0.2	2,635
Bulldozer (Deere Model 700J)	offroad	35		4.8	16.8	27.1	0.0	2.4	2.2	2,201	0.4	0.2	2,268
Forklift (Case 586G Series 3)	offroad	28		1.4	5.3	6.0	0.0	0.6	0.5	609	0.1	0.1	629
Flatbed Utility Truck (Ford F-650 XL)	onroad MD		2,100	4.7	32.5	36.4	0.1	1.4	1.2	5,809	0.2	0.3	5,917
Excavator (Deere 160 D LC)	offroad	192		22.7	100.2	140.2	0.2	12.6	11.6	14,136	2.0	0.9	14,452
Bulldozer (Deere Model 700J)	offroad	144		19.7	69.0	111.4	0.1	10.0	9.2	9,056	1.8	0.8	9,330
Forklift (Case 586G Series 3)	offroad	40		2.0	7.6	8.6	0.0	0.8	0.7	871	0.2	0.1	899
Flatbed Utility Truck or Dump (Ford F-650 XL)	onroad MD		6,750	15.1	104.3	116.9	0.2	4.4	3.7	18,672	0.7	1.1	19,021
Compressor (Sullair 375 H-AF trailer mounted)	Offroad	120		11.2	43.3	71.9	0.1	6.0	5.5	6,540	1.0	0.5	6,697
Generator Magnum MMG25 23KVA Diesel	Offroad	400		16.5	52.3	75.9	0.1	5.1	4.7	8,092	1.5	0.7	8,322
Mobile Crane (Link-Belt RTC-8030 Series II)	offroad	105		11.2	48.3	81.6	0.1	5.1	4.7	7,802	1.0	0.4	7,958
Concrete Transport Truck (assume F650 XL)	onroad HHD		16,800	42.5	171.6	519.5	0.7	25.1	21.7	70,827	2.0	1.8	71,418
Concrete Pumps (Schwing SP 260)	Offroad	56		1.6	4.8	8.7	0.0	0.5	0.5	983	0.1	0.1	1,006
Lowboy tractor and Trailer ( Intern. Paystar 5900 FSA)	onroad HHD		1,200	3.0	12.3	37.1	0.0	1.8	1.6	5,059	0.1	0.1	5,101
Forklift (Case 586G Series 3)	offroad	60		3.0	11.4	12.9	0.0	1.2	1.1	1,306	0.3	0.1	1,348
Flatbed Utility Truck or Dump (Ford F-650 XL)	onroad MD		1,050	2.3	16.2	18.2	0.0	0.7	0.6	2,905	0.1	0.2	2,959
Backhoe (Deere 410J)	offroad	60		14.8	39.2	31.9	0.0	3.4	3.1	2,926	1.3	0.6	3,133
Lowboy tractor and Trailer( Intern. Paystar 5900 FSA)	onroad HHD		300	0.8	3.1	9.3	0.0	0.4	0.4	1,265	0.0	0.0	1,275
<b>South Fork Long Canyon Diversion Dam Modification</b>													
Pickup Truck (Workers)	onroad LD		144,000	114.7	1,102.3	111.7	1.5	12.9	8.3	158,620	10.3	4.2	160,132
Oversize Load Tractor Trailer (5 axles or more)	onroad HHD		360	0.9	3.7	11.1	0.0	0.5	0.5	1,518	0.0	0.0	1,531

Table 9. Estimated Total Emissions for Proposed Project.

Equipment and Vehicles		Project Activity		ROG	CO	NO <sub>x</sub>	SO <sub>x</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	CO <sub>2</sub> eqv
Type	Category	hours	VMT	lbs	lbs	lbs	lbs	lbs	lbs	lbs	lbs	lbs	lbs
Excavator (Deere 160 D LC)	offroad	35		4.1	18.3	25.5	0.0	2.3	2.1	2,577	0.4	0.2	2,635
Bulldozer (Deere Model 700J)	offroad	35		4.8	16.8	27.1	0.0	2.4	2.2	2,201	0.4	0.2	2,268
Forklift (Case 586G Series 3)	offroad	28		1.4	5.3	6.0	0.0	0.6	0.5	609	0.1	0.1	629
Flatbed Utility Truck (Ford F-650 XL)	onroad MD		2,100	4.7	32.5	36.4	0.1	1.4	1.2	5,809	0.2	0.3	5,917
Excavator (Deere 160 D LC)	offroad	192		22.7	100.2	140.2	0.2	12.6	11.6	14,136	2.0	0.9	14,452
Bulldozer (Deere Model 700J)	offroad	144		19.7	69.0	111.4	0.1	10.0	9.2	9,056	1.8	0.8	9,330
Forklift (Case 586G Series 3)	offroad	40		2.0	7.6	8.6	0.0	0.8	0.7	871	0.2	0.1	899
Flatbed Utility Truck or Dump (Ford F-650 XL)	onroad MD		6,750	15.1	104.3	116.9	0.2	4.4	3.7	18,672	0.7	1.1	19,021
Compressor (Sullair 375 H-AF trailer mounted)	Offroad	120		11.2	43.3	71.9	0.1	6.0	5.5	6,540	1.0	0.5	6,697
Generator Magnum MMG25 23KVA Diesel	Offroad	400		16.5	52.3	75.9	0.1	5.1	4.7	8,092	1.5	0.7	8,322
Mobile Crane (Link-Belt RTC-8030 Series II)	offroad	105		11.2	48.3	81.6	0.1	5.1	4.7	7,802	1.0	0.4	7,958
Concrete Transport Truck (assume F650 XL)	onroad HHD		16,800	42.5	171.6	519.5	0.7	25.1	21.7	70,827	2.0	1.8	71,418
Concrete Pumpers (Schwing SP 260)	Offroad	56		1.6	4.8	8.7	0.0	0.5	0.5	983	0.1	0.1	1,006
Lowboy tractor and Trailer ( Intern. Paystar 5900 FSA)	onroad HHD		1,200	3.0	12.3	37.1	0.0	1.8	1.6	5,059	0.1	0.1	5,101
Forklift (Case 586G Series 3)	offroad	60		3.0	11.4	12.9	0.0	1.2	1.1	1,306	0.3	0.1	1,348
Flatbed Utility Truck or Dump (Ford F-650 XL)	onroad MD		1,050	2.3	16.2	18.2	0.0	0.7	0.6	2,905	0.1	0.2	2,959
Backhoe (Deere 410J)	offroad	60		14.8	39.2	31.9	0.0	3.4	3.1	2,926	1.3	0.6	3,133
Lowboy tractor and Trailer( Intern. Paystar 5900 FSA)	onroad HHD		300	0.8	3.1	9.3	0.0	0.4	0.4	1,265	0.0	0.0	1,275
<b>OUTLET WORKS MODIFICATIONS</b>													
<b>Hell Hole Outlet Works Modification</b>													
Pickup Truck (Workers)	onroad LD		72,000	57.3	551.1	55.9	0.8	6.5	4.1	79,310	5.2	2.1	80,066
Excavator (Deere 160 D LC)	offroad	35		4.1	18.3	25.5	0.0	2.3	2.1	2,577	0.4	0.2	2,635
Forklift (Case 586G Series 3)	offroad	14		0.7	2.7	3.0	0.0	0.3	0.3	305	0.1	0.0	315
Flatbed Utility Truck (Ford F-650 XL)	onroad MD		1,050	2.3	16.2	18.2	0.0	0.7	0.6	2,905	0.1	0.2	2,959
Excavator (Deere 160 D LC)	offroad	192		22.7	100.2	140.2	0.2	12.6	11.6	14,136	2.0	0.9	14,452
Bulldozer (Deere Model 700J)	offroad	84		11.5	40.3	65.0	0.1	5.9	5.4	5,283	1.0	0.5	5,443
Forklift (Case 586G Series 3)	offroad	90		4.5	17.1	19.3	0.0	1.8	1.6	1,959	0.4	0.2	2,022
Flatbed Utility Truck or Dump (Ford F-650 XL)	onroad MD		4,500	10.1	69.6	78.0	0.1	2.9	2.5	12,448	0.5	0.7	12,680
Backhoe (Deere 410J) with Hoe ram breaker	offroad	80		19.8	52.3	42.5	0.1	4.5	4.2	3,901	1.8	0.8	4,177
Compressor (Sullair 375 H-AF trailer mounted)	Offroad	120		11.2	43.3	71.9	0.1	6.0	5.5	6,540	1.0	0.5	6,697
Mobile Crane (Link-Belt RTC-8030 Series II)	Off Road	160		17.1	73.6	124.4	0.1	7.8	7.2	11,889	1.5	0.7	12,127
Concrete Transport Truck (assume F650 XL)	onroad HHD		1,050	2.7	10.7	32.5	0.0	1.6	1.4	4,427	0.1	0.1	4,464
Concrete Pumpers (Schwing SP 260)	offroad	56	0	1.6	4.8	8.7	0.0	0.5	0.5	983	0.1	0.1	1,006
Lowboy tractor and Trailer (Paystar 5900 FSA)	onroad HHD		1,200	3.0	12.3	37.1	0.0	1.8	1.6	5,059	0.1	0.1	5,101
Forklift (Case 586G Series 3)	offroad	28		1.4	5.3	6.0	0.0	0.6	0.5	609	0.1	0.1	629
Flatbed Utility Truck or Dump (Ford F-650 XL)	onroad MD		1,050	2.3	16.2	18.2	0.0	0.7	0.6	2,905	0.1	0.2	2,959
Backhoe (Deere 410J)	offroad	60		14.8	39.2	31.9	0.0	3.4	3.1	2,926	1.3	0.6	3,133
Lowboy tractor and Trailer( Intern. Paystar 5900 FSA)	onroad HHD		300	0.8	3.1	9.3	0.0	0.4	0.4	1,265	0.0	0.0	1,275
<b>French Meadows Outlet Works Modification</b>													
Pickup Truck (Workers)	onroad LD		14,400	11.5	110.2	11.2	0.2	1.3	0.8	15,862	1.0	0.4	16,013
Oversize load tractor trailer (5 axles or more)	onroad HHD		360	0.9	3.7	11.1	0.0	0.5	0.5	1,518	0.0	0.0	1,530
Backhoe (Deere 410J)	offroad	9		2.2	5.9	4.8	0.0	0.5	0.5	439	0.2	0.1	470
Flatbed Utility Truck (Ford F-650 XL)	onroad MD		450	1.0	7.0	7.8	0.0	0.3	0.2	1,245	0.0	0.1	1,268
Backhoe (Deere 410J) with Hoe ram breaker	offroad	40		9.9	26.1	21.3	0.0	2.3	2.1	1,951	0.9	0.4	2,089
Flatbed Utility Truck or Dump (Ford F-650 XL)	onroad MD		600	1.3	9.3	10.4	0.0	0.4	0.3	1,660	0.1	0.1	1,691
Welder Hobart Champion elite	offroad	16		1.1	3.4	4.3	0.0	0.4	0.4	410	0.1	0.0	425

**Table 9. Estimated Total Emissions for Proposed Project.**

Equipment and Vehicles		Project Activity		ROG	CO	NO <sub>x</sub>	SO <sub>x</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	CO <sub>2</sub> eqv
Type	Category	hours	VMT	lbs	lbs	lbs	lbs	lbs	lbs	lbs	lbs	lbs	lbs
Generator Magnum MMG25 23KVA Diesel	offroad	160		6.6	20.9	30.4	0.0	2.0	1.9	3,237	0.6	0.3	3,329
Mobile Crane (Link-Belt RTC-8030 Series II)	offroad	8		0.9	3.7	6.2	0.0	0.4	0.4	594	0.1	0.0	606
Concrete Transport Truck (assume F650 XL)	onroad HHD		150	0.4	1.5	4.6	0.0	0.2	0.2	632	0.0	0.0	638
Concrete Pumper (Schwing SP 260)	offroad	4		0.1	0.3	0.6	0.0	0.0	0.0	70	0.0	0.0	72
Lowboy tractor and Trailer (Paystar 5900 FSA)	Onroad HHD		150	0.4	1.5	4.6	0.0	0.2	0.2	632	0.0	0.0	638
Flatbed Utility Truck or Dump (Ford F-650 XL)	onroad MD		300	0.7	4.6	5.2	0.0	0.2	0.2	830	0.0	0.0	845
Backhoe (Deere 410J)	offroad	4		1.0	2.6	2.1	0.0	0.2	0.2	195	0.1	0.0	209
Lowboy tractor and Trailer(Paystar 5900 FSA)	onroad HHD		300	0.8	3.1	9.3	0.0	0.4	0.4	1,265	0.0	0.0	1,275
<b>Middle Fork Interbay Outlet Works Modification</b>													
Pickup Truck (Workers)	onroad LD		14,400	11.5	110.2	11.2	0.2	1.3	0.8	15,862	1.0	0.4	16,013
Oversize load tractor trailer (5 axles or more)	onroad HHD		360	0.9	3.7	11.1	0.0	0.5	0.5	1,518	0.0	0.0	1,530
Backhoe (Deere 410J)	offroad	9		2.2	5.9	4.8	0.0	0.5	0.5	439	0.2	0.1	470
Flatbed Utility Truck (Ford F-650 XL)	onroad MD		450	1.0	7.0	7.8	0.0	0.3	0.2	1,245	0.0	0.1	1,268
Backhoe (Deere 410J) with Hoe ram breaker	offroad	80		19.8	52.3	42.5	0.1	4.5	4.2	3,901	1.8	0.8	4,177
Flatbed Utility Truck or Dump (Ford F-650 XL)	onroad MD		1,200	2.7	18.5	20.8	0.0	0.8	0.7	3,320	0.1	0.2	3,381
Welder Hobart Champion elite	offroad	290		20.4	62.4	78.3	0.1	7.0	6.5	7,425	1.8	0.8	7,709
Generator Magnum MMG25 23KVA Diesel	offroad	120		5.0	15.7	22.8	0.0	1.5	1.4	2,428	0.4	0.2	2,497
Mobile Crane (Link-Belt RTC-8030 Series II)	offroad	40		4.3	18.4	31.1	0.0	2.0	1.8	2,972	0.4	0.2	3,032
Concrete Transport Truck (assume F650 XL)	onroad HHD		750	1.9	7.7	23.2	0.0	1.1	1.0	3,162	0.1	0.1	3,188
Concrete Pumper (Schwing SP 260)	offroad	20		0.6	1.7	3.1	0.0	0.2	0.2	351	0.1	0.0	359
Lowboy tractor and Trailer (Paystar 5900 FSA)	Onroad HHD		450	1.1	4.6	13.9	0.0	0.7	0.6	1,897	0.1	0.0	1,913
Flatbed Utility Truck or Dump (Ford F-650 XL)	onroad MD		1,200	2.7	18.5	20.8	0.0	0.8	0.7	3,320	0.1	0.2	3,381
Backhoe (Deere 410J)	offroad	12		3.0	7.8	6.4	0.0	0.7	0.6	585	0.3	0.1	627
Lowboy tractor and Trailer(Paystar 5900 FSA)	onroad HHD		300	0.8	3.1	9.3	0.0	0.4	0.4	1,265	0.0	0.0	1,275
<b>HELL HOLE RESERVOIR SEASONAL STORAGE INCREASE IMPROVEMENT</b>													
Pickup Truck (Workers)	onroad LD		144,000	114.7	1,102.3	111.7	1.5	12.9	8.3	158,619.7	10.3	4.2	160,132.2
Oversize load tractor trailer (5 axles or more)	onroad HHD		360	0.9	3.7	11.1	0.0	0.5	0.5	1,517.7	0.0	0.0	1,530.4
Front Loader (Deere 444 K)	offroad	126		16.9	66.4	100.7	0.1	9.1	8.4	9,189.5	1.5	0.7	9,425.1
Flatbed Utility Truck or Dump (Ford F-650 XL)	onroad MD		3,200	7.2	49.5	55.4	0.1	2.1	1.8	8,852.1	0.3	0.5	9,017.1
Backhoe (Deere 410J)	offroad	126		31.2	82.3	67.0	0.1	7.1	6.6	6,144.3	2.8	1.2	6,578.8
Compressor (Sullair 375 H-AF trailer mounted)	offroad	126		11.8	45.5	75.5	0.1	6.3	5.8	6,867.2	1.1	0.5	7,031.6
Flatbed Utility Truck or Dump (Ford F-650 XL)	onroad MD		6,000	13.4	92.7	103.9	0.2	3.9	3.3	16,597.7	0.6	1.0	16,907.1
Lowboy tractor and Trailer ( Intern. Paystar 5900 FSA)	onroad HHD		1,200	3.0	12.3	37.1	0.0	1.8	1.6	5,059.1	0.1	0.1	5,101.3
Backhoe (Deere 410J) (Ramhoe attachment)	offroad	256		63.3	167.2	136.1	0.2	14.5	13.4	12,483.6	5.7	2.5	13,366.5
Electrical Boom Type Line Truck (Ford F-650 XL)	offroad	60		10.9	38.9	90.3	0.1	3.8	3.5	11,672.2	1.0	0.4	11,824.8
Generator Magnum MMG25 23KVA Diesel	offroad	1,200		49.5	156.9	227.8	0.3	15.3	14.1	24,275.7	4.5	2.0	24,966.5
Mobile Crane (Link-Belt RTC-8030 Series II)	offroad	126		13.4	58.0	98.0	0.1	6.2	5.7	9,362.5	1.2	0.5	9,550.0
Concrete Transport Truck (assume F650 XL)	onroad HHD		1,200	3.0	12.3	37.1	0.0	1.8	1.6	5,059.1	0.1	0.1	5,101.3
Concrete Pumpers (Schwing SP 260)	offroad	32		0.9	2.7	5.0	0.0	0.3	0.3	561.8	0.1	0.0	574.9
Forklift (Case 586G Series 3)	offroad	128		6.4	24.3	27.4	0.0	2.5	2.3	2,786.1	0.6	0.3	2,875.9
Backhoe (Deere 410J)	offroad	84		20.8	54.9	44.7	0.1	4.8	4.4	4,096.2	1.9	0.8	4,385.9
Flatbed Utility Truck or Dump (Ford F-650 XL)	onroad MD		750	1.7	11.6	13.0	0.0	0.5	0.4	2,074.7	0.1	0.1	2,113.4
Forklift (Case 586G Series 3)	offroad	40		2.0	7.6	8.6	0.0	0.8	0.7	870.6	0.2	0.1	898.7
Generator Magnum MMG25 23KVA Diesel	offroad	150		6.2	19.6	28.5	0.0	1.9	1.8	3,034.5	0.6	0.2	3,120.8
Lowboy tractor and Trailer( Intern. Paystar 5900 FSA)	onroad HHD		300	0.8	3.1	9.3	0.0	0.4	0.4	1,264.8	0.0	0.0	1,275.3

Sources: SCAQMD 2008, EPA 2009

**Table 9. Estimated Total Emissions for Proposed Project.**

Equipment and Vehicles		Project Activity		ROG	CO	NO <sub>x</sub>	SO <sub>x</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	CO <sub>2</sub> eqv
Type	Category	hours	VMT	lbs	lbs	lbs	lbs	lbs	lbs	lbs	lbs	lbs	lbs
<b>CHECKSUM</b>		<b>8,020</b>	<b>791,660</b>										
<b>Pollutant</b>				<b>ROG</b>	<b>CO</b>	<b>NO<sub>x</sub></b>	<b>SO<sub>x</sub></b>	<b>PM<sub>10</sub></b>	<b>PM<sub>2.5</sub></b>	<b>CO<sub>2</sub></b>	<b>CH<sub>4</sub></b>	<b>N<sub>2</sub>O</b>	<b>CO<sub>2</sub> eqv</b>
<b>Total Combustion Emissions, lbs</b>				<b>1,573</b>	<b>9,214</b>	<b>6,893</b>	<b>25</b>	<b>480</b>	<b>417</b>	<b>1,494,138</b>	<b>130</b>	<b>66</b>	<b>1,516,695</b>
<b>Total Combustion Emissions, tons</b>				<b>0.8</b>	<b>4.6</b>	<b>3.4</b>	<b>0.0</b>	<b>0.2</b>	<b>0.2</b>	<b>747</b>	<b>0.1</b>	<b>0.0</b>	<b>758</b>
<b>Hours by Project</b>													
<b>Project Totals for Fugitive Dust Calcs</b>		<b>hours</b>	<b>VMT</b>	<b>Duncan</b>	<b>NFLC</b>	<b>SFLC</b>	<b>HH Outlet</b>	<b>FM Outlet</b>	<b>IB Outlet</b>		<b>HH Store</b>	<b>CKSUM</b>	
Bulldozer		621		179	179	179	84	0	0		0	621	
Grader		0		0	0	0	0	0	0		0	0	
Excavator		908		227	227	227	227	0	0		0	908	
Loader		126		0	0	0	0	0	0		126	126	
Crusher		0											
Screener		0											
Articulated Dump Truck (ADT)		0											
<b>VMT by Project</b>													
Roller/Compactor		0		<b>Duncan</b>	<b>NFLC</b>	<b>SFLC</b>	<b>HH Outlet</b>	<b>FM Outlet</b>	<b>IB Outlet</b>		<b>HH Store</b>		
Light Duty (pickup trucks) LD			676,800	144,000	144,000	144,000	72,000	14,400	14,400		144,000	676,800	
Medium Duty (work trucks) MD			50,450	9,900	9,900	9,900	6,600	1,350	2,850		9,950	50,450	
Heavy Heavy Duty (tractor/trailers) HHD			64,410	18,660	18,660	18,660	2,550	960	1,860		3,060	64,410	
Heavy Heavy Duty (water & quarry trucks)			0										
Articulated Dump Truck (ADT) @ 5 mph avg			0										
<b>CHECKSUM (excludes ADT)</b>			<b>791,660</b>										
												<b>CHECK</b>	<b>791,660</b>

**Notes**

SCAQMD emission factors for 2012 (Ref: SCAQMD 2008)  
 Offroad diesel exhaust PM2.5 = 92% of PM10 per EMFAC 2007 version 2.3  
 HHD includes tire & brake wear  
 Onroad N2O per Annex 3, Table A-99  
 Offroad N2O per Annex 3, Table A-101

		<b>Total Emissions (lbs)</b>											
	Hrs	VMT	ROG	CO	NO <sub>x</sub>	SO <sub>x</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	CO <sub>2</sub> eqv	
Duncan Small Diversion	1,285	172,560	296.42	1,859.52	1,452.93	13.23	96.89	83.53	320,550.49	23.73	12.38	324,797.80	
NFLC Small Diversion	1,275	172,560	297.16	1,862.48	1,461.89	3.24	97.32	83.91	321,773.11	23.76	12.41	326,030.60	
SFLC Small Diversion	1,275	172,560	297.16	1,862.48	1,461.89	3.24	97.32	83.91	321,773.11	23.76	12.41	326,030.60	
Hell Hole Outlet	919	81,150	188.08	1,076.24	787.44	1.66	60.19	53.04	159,425.09	16.05	7.86	162,138.87	
French Meadow Outlet	241	16,710	38.72	203.91	133.97	0.32	9.47	8.21	30,539.28	3.26	1.62	31,098.02	
Interbay Outlet	571	19,110	77.72	337.42	307.10	0.53	22.38	19.94	49,688.31	6.53	3.31	50,821.38	
Hell Hole Seasonal Storage	2,454	157,010	378.11	2,011.69	1,288.24	3.04	96.61	84.53	290,388.90	32.80	15.53	295,777.55	
<b>CHECKSUM</b>	<b>8,020</b>	<b>791,660</b>	<b>1,573</b>	<b>9,214</b>	<b>6,893</b>	<b>25</b>	<b>480</b>	<b>417</b>	<b>1,494,138</b>	<b>130</b>	<b>66</b>	<b>1,516,695</b>	

**Table 10 Estimated Total Emissions for Proposed Project**

Construction Earthmoving	Pk. Daily	Project	Daily	PM <sub>10</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>
	hours	hours	tons	lb/hr	lb/hr	lb/day	lb/day	lbs	lbs
Bulldozer	6	621	n/a	0.23055	0.13280	1.38	0.80	143.17	82.47
Grader	0	0	n/a	0.83700	0.06079	0.00	0.00	0.00	0.00
Excavator/Digger	6	908	5000	0.05629	0.00852	0.34	0.05	51.11	7.74
Loader	6	126	5000	0.05629	0.00852	0.34	0.05	7.09	1.07
<b>Subtotals</b>						<b>2.06</b>	<b>0.90</b>	<b>201</b>	<b>91</b>

---

<b>Peak Daily Fugitive Dust Emissions, lbs/day (onsite)</b>	<b>2.1</b>	<b>0.9</b>
---	------------	------------

---

**Earthmoving Notes:**

AP-42 Section 11.9 for dozing (Table 11.9-1):

$E = 0.75 \times (s)^{1.5} / (M)^{1.4}$  for PM<sub>10</sub>

$E = 0.60 \times (s)^{1.2} / (M)^{1.3}$  for PM<sub>2.5</sub>

E = lb/hr fugitive

s = Silt Content assumed to be 8.5% for construction sites

M = moisture content = 23% (assumes moist subsoil)

AP-42 Section 11.9 for grading & rolling & ADTs (Table 11.9-1) :

$E = S \times 0.60 \times 0.051 \times (S)^{2.0}$  for PM<sub>10</sub>

$E = S \times 0.031 \times 0.040 \times (S)^{2.5}$  for PM<sub>2.5</sub>

Simplifies to  $E = 0.031 \times (S)^{3.0}$  for PM<sub>10</sub>

Simplifies to  $E = 0.0013 \times (S)^{3.5}$  for PM<sub>2.5</sub>

E = lb/VMT \* VMT/hr = lb/hr fugitive

S = Mean Vehicle Speed assumed to be 3 mph for graders; 1.5 mph for rollers

Soil moisture ratio = 5 (95% reduction) for wetted roads

Assumes VMT = S \* hours of use

AP-42 Section 13.2.4 Loading/Handling (digger, borer, backhoe, loader, excavator):

$E = W \times 0.35 \times 0.0032 \times (U/5)^{1.3} / (M/2)^{1.4}$  for PM<sub>10</sub>

$E = W \times 0.053 \times 0.0032 \times (U/5)^{1.3} / (M/2)^{1.4}$  for PM<sub>2.5</sub>

E = lb/ton \* tons/hr = lb/hr fugitive

U = average wind speed is 8 mph (NOAA: <http://lwf.ncdc.noaa.gov/oa/climate/online/ccd/avgwind.html>)

M = moisture content = 23% (assumes moist subsoil)

Assumes sp gr = 2.75 or 2.3 tons/cy; dropped twice (granite)

AP-42 Chapter 11.19.2 Coarse Tertiary Crushing

E = 0.0024 lb/ton uncontrolled PM<sub>10</sub>

E = 0.0004 lb/ton uncontrolled PM<sub>2.5</sub>

Control efficiency = 77.5% where applicable

AP-42 Chapter 11.19.2 Screening

E = 0.0087 lb/ton uncontrolled PM<sub>10</sub>

E = 0.0006 lb/ton uncontrolled PM<sub>2.5</sub>

Control efficiency = 91.5% where applicable

**Staging Area Notes:**

Fugitive dust (as PM<sub>10</sub>) 10 lb/acre-day unmitigated, BAAQMD CEQA Draft Air Quality Guidelines, 2009, Section 6.

BAAQMD Ref: AP-42 Chapter 13.2.3 "Heavy Construction Operations"

Mitigation Ref: AP-42 Chapter 13.2.2 "Unpaved Roads", Figure 13.2.2-2

Soil moisture ratio = 5 (95% reduction)

Consistent with light earthmoving (non-bulldozing) assume PM<sub>2.5</sub> is about 10% of PM<sub>10</sub>

Construction Road Dust	Pk. Daily	Project	Control	PM <sub>10</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>
	VMT	VMT	percent	lb/VMT	lb/VMT	lb/day	lb/day	lbs	lbs
<b>All Roads (totals)</b>									
Light Duty (pickup trucks)	1,200	676,800							
Medium Duty (work trucks)	150	50,450							
Heavy Heavy Duty (tractor/trailers)	1,200	64,410							
Heavy Heavy Duty (water & quarry trucks)	0	0							
Articulated Dump Truck (ADT)	0	0							

**Table 10 Estimated Total Emissions for Proposed Project**

<b>Subtotals</b>	<b>2,550</b>	<b>791,660</b>							
<b>Unpaved Roads (watered)</b>									
Light Duty (pickup trucks)	120	67,680	95%	0.05789	0.00579	6.9	0.7	2,952	295
Medium Duty (work trucks)	15	5,045	95%	0.09001	0.00900	1.4	0.1	342	34
Heavy Heavy Duty (tractor/trailers)	120	6,441	95%	0.16316	0.01632	19.6	2.0	792	79
Heavy Heavy Duty (water & quarry trucks)	0	0	95%	0.16316	0.01632	0.0	0.0	0	0
Articulated Dump Truck (ADT)	0	0	95%	0.16316	0.01632	0.0	0.0	0	0
<b>Subtotals</b>	<b>255</b>	<b>79,166</b>				<b>27.9</b>	<b>2.8</b>	<b>4,086</b>	<b>409</b>
<b>Paved Roads</b>									
Light Duty (pickup trucks)	1,080	609,120		0.00334	0.00021	3.6	0.2	1,910	121
Medium Duty (work trucks)	135	45,405		0.01613	0.00213	2.2	0.3	687	91
Heavy Heavy Duty (tractor/trailers)	1,080	57,969		0.12004	0.01772	129.6	19.1	6,530	964
Heavy Heavy Duty (water & quarry trucks)	0	0		0.12004	0.01772	0.0	0.0	0	0
Articulated Dump Truck (ADT)	0	0		0.12004	0.01772	0.0	0.0	0	0
<b>Subtotals</b>	<b>2,295</b>	<b>712,494</b>				<b>135.4</b>	<b>19.6</b>	<b>9,126</b>	<b>1,175</b>
<b>Peak Daily Road Dust Emissions, lbs/day (offsite)</b>						<b>163.3</b>	<b>22.4</b>		
<b>Total Road Dust Emissions, tons (offsite)</b>								<b>6.6</b>	<b>0.8</b>
<b>Composite Peak Daily Fugitive Dust Emissions, lbs/day</b>						<b>165.4</b>	<b>23.3</b>		
<b>Composite Total Fugitive Dust Emissions, tons</b>								<b>6.7</b>	<b>0.8</b>

Road Dust Notes:

*Unpaved Road Dust (AP-42 Section 13.2.2):*

$$E = 1.5 * (s/12)^{0.9} * (W/3)^{0.45} * P_C * (1-CE) \text{ for } PM_{10}$$

$$E = 0.15 * (s/12)^{0.9} * (W/3)^{0.45} * P_C * (1-CE) \text{ for } PM_{2.5}$$

E = lb/VMT fugitive

s = surface silt content = 9% (average for unpaved roads and construction sites, AP-42 Table 13.2.2-1)

W = average vehicle weight (see below)

$$P_C = (365-P)/365$$

P = Number of wet days over 0.01 in precipitation for averaging period (90 days/year average for Sierras AP-42)

Note: precipitation correction not used ( $P_C = 1$ ) for worst case day calculations

CE = Control Efficiency for watering = 95% for M = 5 (AP-42 Figure 13.2.2-2)

Light Duty = 3 tons average

Medium Duty = 8 tons average

Heavy Heavy Duty = 30 tons average (loaded 40 tons, unloaded 20 tons)

Assumes 90% paved mileage, 10% unpaved mileage for LD, MD, and HHD

*Paved Road Dust (AP-42 Section 13.2.1):*

$$E = [0.016 * (sL/2)^{0.65} * (W/3)^{1.5} - 0.00047] * P_C \text{ for } PM_{10}$$

$$E = [0.0024 * (sL/2)^{0.65} * (W/3)^{1.5} - 0.00036] * P_C \text{ for } PM_{2.5}$$

E = lb/VMT fugitive

sL = Silt Loading assumed to be 0.22 g/m<sup>2</sup> for average ADT categories from Table 13.2.1-3

W = Average weight of vehicles in tons (below)

C = Correction for exhaust, break wear, tire wear: 0.00047 lb/VMT for PM<sub>10</sub>, 0.00036 lb/VMT for PM<sub>2.5</sub>

$$P_C = (1-P/4N)$$

P = Number of wet days over 0.01 in precipitation for averaging period (90 days/year average for Sierras AP-42)

N = days of period = 365 days (4N = 1460)

Note: precipitation correction not used ( $P_C = 1$ ) for worst case day calculations

Light Duty = 3 tons average

Medium Duty = 8 tons average

Heavy Heavy Duty = 30 tons average (loaded 40 tons, unloaded 20 tons)

Assumes 90% paved mileage, 10% unpaved mileage for LD, MD, and HHD



**Table 11 Estimated Total Emissions for Proposed Project**

<b>SMALL DIVERSION MODIFICATIONS Construction Earthmoving</b>	<b>Pk. Daily</b>	<b>Project</b>	<b>Daily</b>	<b>PM<sub>10</sub></b>	<b>PM<sub>2.5</sub></b>	<b>PM<sub>10</sub></b>	<b>PM<sub>2.5</sub></b>	<b>PM<sub>10</sub></b>	<b>PM<sub>2.5</sub></b>
	<b>hours</b>	<b>hours</b>	<b>tons</b>	<b>lb/hr</b>	<b>lb/hr</b>	<b>lb/day</b>	<b>lb/day</b>	<b>lbs</b>	<b>lbs</b>
Bulldozer	6	179	n/a	0.23055	0.13280	1.38	0.80	41.27	23.77
Grader	0	0	n/a	0.00000	0.00000	0.00	0.00	0.00	0.00
Excavator/Digger	6	227	5000	0.05629	0.00852	0.34	0.05	12.78	1.93
Loader	0	0	5000	0.00000	0.00000	0.00	0.00	0.00	0.00
<b>Subtotals</b>						<b>1.72</b>	<b>0.85</b>	<b>54</b>	<b>26</b>
<b>Peak Daily Fugitive Dust Emissions, lbs/day (onsite)</b>						<b>1.7</b>	<b>0.8</b>		

  

<b>SMALL DIVERSION MODIFICATIONS Construction Road Dust</b>	<b>Pk. Daily</b>	<b>Project</b>	<b>Control</b>	<b>PM<sub>10</sub></b>	<b>PM<sub>2.5</sub></b>	<b>PM<sub>10</sub></b>	<b>PM<sub>2.5</sub></b>	<b>PM<sub>10</sub></b>	<b>PM<sub>2.5</sub></b>
	<b>VMT</b>	<b>VMT</b>	<b>percent</b>	<b>lb/VMT</b>	<b>lb/VMT</b>	<b>lb/day</b>	<b>lb/day</b>	<b>lbs</b>	<b>lbs</b>
<b>All Roads (totals)</b>									
Light Duty (pickup trucks)	1,200	144,000							
Medium Duty (work trucks)	150	9,900							
Heavy Heavy Duty (tractor/trailers)	1,200	18,660							
Heavy Heavy Duty (water & quarry trucks)	0	0							
Articulated Dump Truck (ADT)	0	0							
<b>Subtotals</b>	<b>2,550</b>	<b>172,560</b>							
<b>Unpaved Roads (watered)</b>									
Light Duty (pickup trucks)	120	14,400	95%	0.05789	0.00579	6.9	0.7	628	63
Medium Duty (work trucks)	15	990	95%	0.09001	0.00900	1.4	0.1	67	7
Heavy Heavy Duty (tractor/trailers)	120	1,866	95%	0.16316	0.01632	19.6	2.0	229	23
Heavy Heavy Duty (water & quarry trucks)	0	0	95%	0.16316	0.01632	0.0	0.0	0	0
Articulated Dump Truck (ADT)	0	0	95%	0.16316	0.01632	0.0	0.0	0	0
<b>Subtotals</b>	<b>255</b>	<b>17,256</b>				<b>27.9</b>	<b>2.8</b>	<b>925</b>	<b>92</b>
<b>Paved Roads</b>									
Light Duty (pickup trucks)	1,080	129,600		0.00334	0.00021	3.6	0.2	406	26
Medium Duty (work trucks)	135	8,910		0.01613	0.00213	2.2	0.3	135	18
Heavy Heavy Duty (tractor/trailers)	1,080	16,794		0.12004	0.01772	129.6	19.1	1,892	279
Heavy Heavy Duty (water & quarry trucks)	0	0		0.12004	0.01772	0.0	0.0	0	0
Articulated Dump Truck (ADT)	0	0		0.12004	0.01772	0.0	0.0	0	0
<b>Subtotals</b>	<b>2,295</b>	<b>155,304</b>				<b>135.4</b>	<b>19.6</b>	<b>2,433</b>	<b>323</b>
<b>Peak Daily Road Dust Emissions, lbs/day (offsite)</b>						<b>163.3</b>	<b>22.4</b>		
<b>Total Road Dust Emissions, tons (offsite)</b>								<b>1.7</b>	<b>0.2</b>
<b>Composite Peak Daily Fugitive Dust Emissions, lbs/day</b>						<b>165.0</b>	<b>23.3</b>		
<b>Composite Total Fugitive Dust Emissions, tons</b>								<b>1.7</b>	<b>0.2</b>

**Table 11 Estimated Total Emissions for Proposed Project**

HELL HOLE DAM OUTLET WORKS MODIFICATION Construction Earthmoving	Pk. Daily	Project	Daily	PM <sub>10</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>
	hours	hours	tons	lb/hr	lb/hr	lb/day	lb/day	lbs	lbs
Bulldozer	6	84	n/a	0.23055	0.13280	1.38	0.80	19.37	11.16
Grader	0	0	n/a	0.00000	0.00000	0.00	0.00	0.00	0.00
Excavator/Digger	6	227	5000	0.05629	0.00852	0.34	0.05	12.78	1.93
Loader	0	0	5000	0.00000	0.00000	0.00	0.00	0.00	0.00
<b>Subtotals</b>						<b>1.72</b>	<b>0.85</b>	<b>32</b>	<b>13</b>
<b>Peak Daily Fugitive Dust Emissions, lbs/day (onsite)</b>						<b>1.7</b>	<b>0.8</b>		

  

HELL HOLE DAM OUTLET WORKS MODIFICATION Construction Road Dust	Pk. Daily	Project	Control	PM <sub>10</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>
	VMT	VMT	percent	lb/VMT	lb/VMT	lb/day	lb/day	lbs	lbs
<u>All Roads (totals)</u>									
Light Duty (pickup trucks)	1,200	72,000							
Medium Duty (work trucks)	150	6,600							
Heavy Heavy Duty (tractor/trailers)	1,200	2,550							
Heavy Heavy Duty (water & quarry trucks)	0	0							
Articulated Dump Truck (ADT)	0	0							
<b>Subtotals</b>	<b>2,550</b>	<b>81,150</b>							
<u>Unpaved Roads (watered)</u>									
Light Duty (pickup trucks)	120	7,200	95%	0.05789	0.00579	6.9	0.7	314	31
Medium Duty (work trucks)	15	660	95%	0.09001	0.00900	1.4	0.1	45	4
Heavy Heavy Duty (tractor/trailers)	120	255	95%	0.16316	0.01632	19.6	2.0	31	3
Heavy Heavy Duty (water & quarry trucks)	0	0	95%	0.16316	0.01632	0.0	0.0	0	0
Articulated Dump Truck (ADT)	0	0	95%	0.16316	0.01632	0.0	0.0	0	0
<b>Subtotals</b>	<b>255</b>	<b>8,115</b>				<b>27.9</b>	<b>2.8</b>	<b>390</b>	<b>39</b>
<u>Paved Roads</u>									
Light Duty (pickup trucks)	1,080	64,800		0.00334	0.00021	3.6	0.2	203	13
Medium Duty (work trucks)	135	5,940		0.01613	0.00213	2.2	0.3	90	12
Heavy Heavy Duty (tractor/trailers)	1,080	2,295		0.12004	0.01772	129.6	19.1	259	38
Heavy Heavy Duty (water & quarry trucks)	0	0		0.12004	0.01772	0.0	0.0	0	0
Articulated Dump Truck (ADT)	0	0		0.12004	0.01772	0.0	0.0	0	0
<b>Subtotals</b>	<b>2,295</b>	<b>73,035</b>				<b>135.4</b>	<b>19.6</b>	<b>552</b>	<b>63</b>
<b>Peak Daily Road Dust Emissions, lbs/day (offsite)</b>						<b>163.3</b>	<b>22.4</b>		
<b>Total Road Dust Emissions, tons (offsite)</b>								<b>0.5</b>	<b>0.1</b>
<b>Composite Peak Daily Fugitive Dust Emissions, lbs/day</b>						<b>165.0</b>	<b>23.3</b>		
<b>Composite Total Fugitive Dust Emissions, tons</b>								<b>0.5</b>	<b>0.1</b>

**Table 11 Estimated Total Emissions for Proposed Project**

FRENCH MEADOWS DAM OUTLET WORKS MODIFICATION Construction Earthmoving	Pk. Daily	Project	Daily	PM <sub>10</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>
	hours	hours	tons	lb/hr	lb/hr	lb/day	lb/day	lbs	lbs
Bulldozer	0	0	n/a	0.23055	0.13280	0.00	0.00	0.00	0.00
Grader	0	0	n/a	0.00000	0.00000	0.00	0.00	0.00	0.00
Excavator/Digger	0	0	5000	0.00000	0.00000	0.00	0.00	0.00	0.00
Loader	0	0	5000	0.00000	0.00000	0.00	0.00	0.00	0.00
<b>Subtotals</b>						<b>0.00</b>	<b>0.00</b>	<b>0</b>	<b>0</b>

**Peak Daily Fugitive Dust Emissions, lbs/day (onsite) 0.0 0.0**

FRENCH MEADOWS DAM OUTLET WORKS MODIFICATION	Pk. Daily	Project	Control	PM <sub>10</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>
	VMT	VMT	percent	lb/VMT	lb/VMT	lb/day	lb/day	lbs	lbs
<u>All Roads (totals)</u>									
Light Duty (pickup trucks)	480	14,400							
Medium Duty (work trucks)	150	1,350							
Heavy Heavy Duty (tractor/trailers)	150	960							
Heavy Heavy Duty (water & quarry trucks)	0	0							
Articulated Dump Truck (ADT)	0	0							
<b>Subtotals</b>	<b>780</b>	<b>16,710</b>							

<u>Unpaved Roads (watered)</u>									
	Pk. Daily	Project	Control	PM <sub>10</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>
	VMT	VMT	percent	lb/VMT	lb/VMT	lb/day	lb/day	lbs	lbs
Light Duty (pickup trucks)	48	1,440	95%	0.05789	0.00579	2.8	0.3	63	6
Medium Duty (work trucks)	15	135	95%	0.09001	0.00900	1.4	0.1	9	1
Heavy Heavy Duty (tractor/trailers)	15	96	95%	0.16316	0.01632	2.4	0.2	12	1
Heavy Heavy Duty (water & quarry trucks)	0	0	95%	0.16316	0.01632	0.0	0.0	0	0
Articulated Dump Truck (ADT)	0	0	95%	0.16316	0.01632	0.0	0.0	0	0
<b>Subtotals</b>	<b>78</b>	<b>1,671</b>				<b>6.6</b>	<b>0.7</b>	<b>84</b>	<b>8</b>

<u>Paved Roads</u>									
	Pk. Daily	Project	Control	PM <sub>10</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>
	VMT	VMT	percent	lb/VMT	lb/VMT	lb/day	lb/day	lbs	lbs
Light Duty (pickup trucks)	432	12,960		0.00334	0.00021	1.4	0.1	41	3
Medium Duty (work trucks)	135	1,215		0.01613	0.00213	2.2	0.3	18	2
Heavy Heavy Duty (tractor/trailers)	135	864		0.12004	0.01772	16.2	2.4	97	14
Heavy Heavy Duty (water & quarry trucks)	0	0		0.12004	0.01772	0.0	0.0	0	0
Articulated Dump Truck (ADT)	0	0		0.12004	0.01772	0.0	0.0	0	0
<b>Subtotals</b>	<b>702</b>	<b>15,039</b>				<b>19.8</b>	<b>2.8</b>	<b>156</b>	<b>19</b>

**Peak Daily Road Dust Emissions, lbs/day (offsite) 26.4 3.4**

**Total Road Dust Emissions, tons (offsite) 0.1 0.0**

**Composite Peak Daily Fugitive Dust Emissions, lbs/day 26.4 3.4**

**Composite Total Fugitive Dust Emissions, tons 0.1 0.0**

**Table 11 Estimated Total Emissions for Proposed Project**

MIDDLE FORK INTERBAY DAM OUTLET WORKS MODIFICATION Construction Earthmoving	Pk. Daily	Project	Daily	PM <sub>10</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>
	hours	hours	tons	lb/hr	lb/hr	lb/day	lb/day	lbs	lbs
Bulldozer	0	0	n/a	0.23055	0.13280	0.00	0.00	0.00	0.00
Grader	0	0	n/a	0.00000	0.00000	0.00	0.00	0.00	0.00
Excavator/Digger	0	0	5000	0.00000	0.00000	0.00	0.00	0.00	0.00
Loader	0	0	5000	0.00000	0.00000	0.00	0.00	0.00	0.00
<b>Subtotals</b>						<b>0.00</b>	<b>0.00</b>	<b>0</b>	<b>0</b>
<b>Peak Daily Fugitive Dust Emissions, lbs/day (onsite)</b>						<b>0.0</b>	<b>0.0</b>		

  

MIDDLE FORK INTERBAY DAM OUTLET WORKS MODIFICATION	Pk. Daily	Project	Control	PM <sub>10</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>
	VMT	VMT	percent	lb/VMT	lb/VMT	lb/day	lb/day	lbs	lbs
<u>All Roads (totals)</u>									
Light Duty (pickup trucks)	480	14,400							
Medium Duty (work trucks)	150	2,850							
Heavy Heavy Duty (tractor/trailers)	150	1,860							
Heavy Heavy Duty (water & quarry trucks)	0	0							
Articulated Dump Truck (ADT)	0	0							
<b>Subtotals</b>	<b>780</b>	<b>19,110</b>							
<u>Unpaved Roads (watered)</u>									
Light Duty (pickup trucks)	48	1,440	95%	0.05789	0.00579	2.8	0.3	63	6
Medium Duty (work trucks)	15	285	95%	0.09001	0.00900	1.4	0.1	19	2
Heavy Heavy Duty (tractor/trailers)	15	186	95%	0.16316	0.01632	2.4	0.2	23	2
Heavy Heavy Duty (water & quarry trucks)	0	0	95%	0.16316	0.01632	0.0	0.0	0	0
Articulated Dump Truck (ADT)	0	0	95%	0.16316	0.01632	0.0	0.0	0	0
<b>Subtotals</b>	<b>78</b>	<b>1,911</b>				<b>6.6</b>	<b>0.7</b>	<b>105</b>	<b>11</b>
<u>Paved Roads</u>									
Light Duty (pickup trucks)	432	12,960		0.00334	0.00021	1.4	0.1	41	3
Medium Duty (work trucks)	135	2,565		0.01613	0.00213	2.2	0.3	39	5
Heavy Heavy Duty (tractor/trailers)	135	1,674		0.12004	0.01772	16.2	2.4	189	28
Heavy Heavy Duty (water & quarry trucks)	0	0		0.12004	0.01772	0.0	0.0	0	0
Articulated Dump Truck (ADT)	0	0		0.12004	0.01772	0.0	0.0	0	0
<b>Subtotals</b>	<b>702</b>	<b>17,199</b>				<b>19.8</b>	<b>2.8</b>	<b>268</b>	<b>36</b>
<b>Peak Daily Road Dust Emissions, lbs/day (offsite)</b>						<b>26.4</b>	<b>3.4</b>		
<b>Total Road Dust Emissions, tons (offsite)</b>								<b>0.2</b>	<b>0.0</b>
<b>Composite Peak Daily Fugitive Dust Emissions, lbs/day</b>						<b>26.4</b>	<b>3.4</b>		
<b>Composite Total Fugitive Dust Emissions, tons</b>								<b>0.2</b>	<b>0.0</b>

**Table 11 Estimated Total Emissions for Proposed Project**

HELL HOLE RESERVOIR SEASONAL STORAGE INCREASE IMPROVEMENT Construction Earthmoving	Pk. Daily	Project	Daily	PM <sub>10</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>
	hours	hours	tons	lb/hr	lb/hr	lb/day	lb/day	lbs	lbs
Bulldozer	0	0	n/a	0.23055	0.13280	0.00	0.00	0.00	0.00
Grader	0	0	n/a	0.00000	0.00000	0.00	0.00	0.00	0.00
Excavator/Digger	0	0	5000	0.00000	0.00000	0.00	0.00	0.00	0.00
Loader	6	6	5000	0.00000	0.00000	0.00	0.00	0.00	0.00
<b>Subtotals</b>						<b>0.00</b>	<b>0.00</b>	<b>0</b>	<b>0</b>
<b>Peak Daily Fugitive Dust Emissions, lbs/day (onsite)</b>						<b>0.0</b>	<b>0.0</b>		

  

HELL HOLE RESERVOIR SEASONAL STORAGE INCREASE IMPROVEMENT	Pk. Daily	Project	Control	PM <sub>10</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>
	VMT	VMT	percent	lb/VMT	lb/VMT	lb/day	lb/day	lbs	lbs
<b>All Roads (totals)</b>									
Light Duty (pickup trucks)	1,200	144,000							
Medium Duty (work trucks)	150	9,950							
Heavy Heavy Duty (tractor/trailers)	150	3,060							
Heavy Heavy Duty (water & quarry trucks)	0	0							
Articulated Dump Truck (ADT)	0	0							
<b>Subtotals</b>	<b>1,500</b>	<b>157,010</b>							
<b>Unpaved Roads (watered)</b>									
Light Duty (pickup trucks)	120	14,400	95%	0.05789	0.00579	6.9	0.7	628	63
Medium Duty (work trucks)	15	995	95%	0.09001	0.00900	1.4	0.1	67	7
Heavy Heavy Duty (tractor/trailers)	15	306	95%	0.16316	0.01632	2.4	0.2	38	4
Heavy Heavy Duty (water & quarry trucks)	0	0	95%	0.16316	0.01632	0.0	0.0	0	0
Articulated Dump Truck (ADT)	0	0	95%	0.16316	0.01632	0.0	0.0	0	0
<b>Subtotals</b>	<b>150</b>	<b>15,701</b>				<b>10.7</b>	<b>1.1</b>	<b>733</b>	<b>73</b>
<b>Paved Roads</b>									
Light Duty (pickup trucks)	1,080	129,600		0.00334	0.00021	3.6	0.2	406	26
Medium Duty (work trucks)	135	8,955		0.01613	0.00213	2.2	0.3	135	18
Heavy Heavy Duty (tractor/trailers)	135	2,754		0.12004	0.01772	16.2	2.4	310	46
Heavy Heavy Duty (water & quarry trucks)	0	0		0.12004	0.01772	0.0	0.0	0	0
Articulated Dump Truck (ADT)	0	0		0.12004	0.01772	0.0	0.0	0	0
<b>Subtotals</b>	<b>1,350</b>	<b>141,309</b>				<b>22.0</b>	<b>2.9</b>	<b>852</b>	<b>89</b>
<b>Peak Daily Road Dust Emissions, lbs/day (offsite)</b>						<b>32.7</b>	<b>4.0</b>		
<b>Total Road Dust Emissions, tons (offsite)</b>								<b>0.79</b>	<b>0.08</b>
<b>Composite Peak Daily Fugitive Dust Emissions, lbs/day</b>						<b>32.7</b>	<b>4.0</b>		
<b>Composite Total Fugitive Dust Emissions, tons</b>								<b>0.79</b>	<b>0.08</b>

**SCAB Fleet Average Emission Factors (Diesel)**

Offroad 2012

Interpolation / Extrapolation

Air Basin SC

Equipment	MaxHP	(lb/hr) ROG	(lb/hr) CO	(lb/hr) NOX	(lb/hr) SOX	(lb/hr) PM10	(lb/hr) PM2.5	(lb/hr) CO2	(lb/hr) CH4	(lb/hr) N2O	(lb/hr) CO2 eqv
Aerial Lifts	10	0.0068	0.0352	0.0428	0.0001	0.0020	0.0018	5.8	0.0006	0.0003	5.9
	15	0.0102	0.0528	0.0642	0.0001	0.0030	0.0027	8.7	0.0009	0.0004	8.8
	25	0.0175	0.0517	0.0957	0.0001	0.0055	0.0050	11.0	0.0016	0.0007	11.2
	50	0.0650	0.1822	0.1916	0.0003	0.0169	0.0156	19.6	0.0059	0.0026	20.5
	75	0.0635	0.2046	0.2665	0.0003	0.0224	0.0206	26.2	0.0057	0.0025	27.1
	120	0.0607	0.2451	0.4012	0.0004	0.0324	0.0298	38.1	0.0055	0.0024	38.9
	500	0.1276	0.4941	1.6553	0.0021	0.0491	0.0452	213	0.0115	0.0051	214.6
	750	0.2379	0.8930	3.0795	0.0039	0.0903	0.0831	385	0.0215	0.0095	388.1
	1000	0.3172	1.1907	4.1060	0.0052	0.1204	0.1107	513.0081	0.0286	0.0127	517.4
Aerial Lifts Composite		0.0576	0.1976	0.3249	0.0004	0.0219	0.0202	34.7	0.0052	0.0023	35.5
Air Compressors	15	0.0129	0.0494	0.0768	0.0001	0.0052	0.0048	7.2	0.0012	0.0005	7.4
	25	0.0286	0.0779	0.1337	0.0002	0.0087	0.0080	14.4	0.0026	0.0011	14.8
	50	0.1010	0.2646	0.2310	0.0003	0.0239	0.0220	22.3	0.0091	0.0040	23.7
	120	0.0891	0.3287	0.5333	0.0006	0.0492	0.0453	47.0	0.0080	0.0036	48.2
	130	0.0936	0.3612	0.5992	0.0006	0.0496	0.0458	54.5017	0.0084	0.0038	55.8064
	175	0.1135	0.5074	0.8954	0.0010	0.0512	0.0471	88.5	0.0102	0.0046	90.1
	250	0.1066	0.3052	1.2194	0.0015	0.0379	0.0349	131	0.0096	0.0043	132.7
	500	0.1709	0.5726	1.9077	0.0023	0.0623	0.0573	232	0.0154	0.0069	234.1
	750	0.2681	0.8849	3.0371	0.0036	0.0980	0.0901	358	0.0242	0.0108	361.9
	1000	0.4533	1.5617	5.4098	0.0049	0.1589	0.1462	486	0.0409	0.0182	492.7
Air Compressors Composite		0.0984	0.3445	0.6494	0.0007	0.0469	0.0432	63.6	0.0089	0.0039	65.0
Bore/Drill Rigs	15	0.0120	0.0632	0.0754	0.0002	0.0029	0.0027	10.3	0.0011	0.0005	10.5
	25	0.0194	0.0658	0.1233	0.0002	0.0054	0.0049	16.0	0.0017	0.0008	16.3
	50	0.0351	0.2335	0.2768	0.0004	0.0149	0.0138	31.0	0.0032	0.0014	31.5
	120	0.0514	0.4724	0.5026	0.0009	0.0328	0.0302	77.1	0.0046	0.0021	77.8
	175	0.0750	0.7538	0.7479	0.0016	0.0366	0.0337	141	0.0068	0.0030	142.1
	250	0.0838	0.3435	0.8722	0.0021	0.0268	0.0247	188	0.0076	0.0034	189.3
	500	0.1354	0.5526	1.3152	0.0031	0.0437	0.0402	311	0.0122	0.0054	313.2
	750	0.2685	1.0916	2.6320	0.0062	0.0865	0.0795	615	0.0242	0.0108	618.8
	1000	0.4491	1.6773	6.6123	0.0093	0.1699	0.1563	928	0.0405	0.0180	934.5
Bore/Drill Rigs Composite		0.0854	0.5068	0.9013	0.0017	0.0367	0.0338	166.2	0.0077	0.0034	166.2
Cement and Mortar Mixers	15	0.0075	0.0386	0.0475	0.0001	0.0023	0.0021	6.3	0.0007	0.0003	6.4
	25	0.0293	0.0852	0.1548	0.0002	0.0091	0.0083	17.6	0.0026	0.0012	18.0
Cement and Mortar Mixers Composite		0.0093	0.0425	0.0564	0.0001	0.0029	0.0027	7.2	0.0008	0.0004	7.4
Concrete/Industrial Saws	25	0.0199	0.0678	0.1261	0.0002	0.0050	0.0046	16.5	0.0018	0.0008	16.8
	50	0.1047	0.3015	0.2972	0.0004	0.0268	0.0246	30.2	0.0094	0.0042	31.7
	120	0.1155	0.4880	0.7625	0.0009	0.0639	0.0588	74.1	0.0104	0.0046	75.8
	175	0.1685	0.8723	1.4507	0.0018	0.0767	0.0706	160	0.0152	0.0068	162.5
Concrete/Industrial Saws Composite		0.1090	0.4148	0.5910	0.0007	0.0491	0.0452	58.5	0.0098	0.0044	60.0
Cranes	50	0.1101	0.2979	0.2478	0.0003	0.0258	0.0237	23.7	0.0099	0.0044	24.7
	120	0.0982	0.3650	0.5844	0.0006	0.0533	0.0491	50.1	0.0089	0.0039	51.5
	164	0.1067	0.4600	0.7776	0.0008	0.0490	0.0451	74.3053	0.0096	0.0043	75.7935
	175	0.1089	0.4838	0.8259	0.0009	0.0479	0.0441	80.3	0.0098	0.0044	81.9
	250	0.1103	0.3103	1.0712	0.0013	0.0388	0.0357	112	0.0100	0.0044	113.7
	256	0.1116	0.3165	1.0823	0.0013	0.0393	0.0361	113.8	0.0101	0.0045	115.3
	500	0.1635	0.5691	1.5327	0.0018	0.0571	0.0525	180	0.0148	0.0066	182.4
	750	0.2767	0.9554	2.6486	0.0030	0.0974	0.0896	303	0.0250	0.0111	306.9
	9999	0.9905	3.5715	10.9484	0.0098	0.3384	0.3113	971	0.0894	0.0397	984.4
Cranes Composite		0.1425	0.4946	1.2753	0.0014	0.0553	0.0509	129	0.0129	0.0057	130.6
Crawler Tractors	50	0.1262	0.3333	0.2713	0.0003	0.0289	0.0266	24.9	0.0114	0.0051	26.6
	98	0.2473	0.6532	0.5317	0.0006	0.0567	0.0522	48.7640	0.0223	0.0099	52.2130
	115	0.1366	0.4794	0.7733	0.0007	0.0698	0.0642	62.8869	0.0123	0.0055	64.7923
	120	0.1374	0.4906	0.8120	0.0008	0.0729	0.0671	65.8	0.0124	0.0055	67.7
	175	0.1758	0.7491	1.3245	0.0014	0.0765	0.0704	121	0.0159	0.0071	123.6
	200	0.1790	0.6735	1.4511	0.0015	0.0733	0.0674	136.2	0.0162	0.0072	138.7
	250	0.1854	0.5225	1.7044	0.0019	0.0667	0.0614	166	0.0167	0.0074	168.7
	310	0.2047	0.6423	1.8693	0.0020	0.0733	0.0675	188.5	0.0185	0.0082	191.3
	500	0.2659	1.0217	2.3914	0.0025	0.0942	0.0867	259	0.0240	0.0107	262.9
	750	0.4784	1.8248	4.3817	0.0047	0.1705	0.1569	465	0.0432	0.0192	471.4
	1000	0.7229	2.8959	7.7626	0.0066	0.2503	0.2303	658	0.0652	0.0290	668.2
Crawler Tractors Composite		0.1671	0.6051	1.2309	0.0013	0.0752	0.0692	114	0.0151	0.0067	116.4
Crushing/Proc. Equipment	25	0.0963	0.2607	0.2272	0.0003	0.0231	0.0212	22.0	0.0087	0.0039	23.4
	40	0.1542	0.4172	0.3636	0.0005	0.0370	0.0340	35.2	0.0139	0.0062	37.4
	50	0.1927	0.5215	0.4545	0.0006	0.0462	0.0425	44.0	0.0174	0.0077	46.7
	120	0.1525	0.5829	0.9172	0.0010	0.0851	0.0783	83.1	0.0138	0.0061	85.3
	175	0.2088	0.9654	1.6343	0.0019	0.0946	0.0870	167	0.0188	0.0084	170.2
	250	0.1953	0.5592	2.1896	0.0028	0.0682	0.0628	245	0.0176	0.0078	247.3
	260	0.1984	0.5727	2.2198	0.0028	0.0694	0.0638	249.7	0.0179	0.0080	252.5
	325	0.2300	0.6810	2.5672	0.0032	0.0809	0.0744	294.7	0.0208	0.0092	297.9
	500	0.2733	0.8961	2.9457	0.0037	0.0972	0.0894	374	0.0247	0.0110	377.5
	750	0.4361	1.3892	4.8387	0.0059	0.1560	0.1435	589	0.0394	0.0175	594.9
	9999	1.2112	4.0327	14.2648	0.0131	0.4203	0.3867	1,308	0.1093	0.0486	1324.6
Crushing/Proc. Equipment Composite		0.1872	0.6911	1.2633	0.0015	0.0819	0.0753	132	0.0169	0.0075	134.9
Dumpers/Tenders	25	0.0100	0.0324	0.0614	0.0001	0.0031	0.0029	7.6	0.0009	0.0004	7.8
Dumpers/Tenders Composite		0.0100	0.0324	0.0614	0.0001	0.0031	0.0029	7.6	0.0009	0.0004	7.8

**SCAB Fleet Average Emission Factors (Diesel)**

Offroad 2012

Interpolation / Extrapolation

Air Basin SC

Equipment	MaxHP	(lb/hr) ROG	(lb/hr) CO	(lb/hr) NOX	(lb/hr) SOX	(lb/hr) PM10	(lb/hr) PM2.5	(lb/hr) CO2	(lb/hr) CH4	(lb/hr) N2O	(lb/hr) CO2 eqv
Excavators	25	0.0198	0.0677	0.1253	0.0002	0.0048	0.0044	16.4	0.0018	0.0008	16.7
	50	0.0912	0.2933	0.2568	0.0003	0.0237	0.0218	25.0	0.0082	0.0037	26.3
	57	0.0939	0.3162	0.3041	0.0004	0.0279	0.0256	29.9	0.0085	0.0038	31.2
	120	0.1183	0.5220	0.7300	0.0009	0.0657	0.0605	73.6	0.0107	0.0047	75.3
	175	0.1288	0.6678	0.9613	0.0013	0.0569	0.0523	112	0.0116	0.0052	114.0
	250	0.1301	0.3630	1.2438	0.0018	0.0415	0.0382	159	0.0117	0.0052	160.5
	500	0.1805	0.5493	1.6112	0.0023	0.0574	0.0528	234	0.0163	0.0072	236.3
	513	0.1868	0.5680	1.6709	0.0024	0.0595	0.0547	241.7	0.0169	0.0075	244.3
	750	0.3013	0.9096	2.7605	0.0039	0.0969	0.0891	387	0.0272	0.0121	391.6
Excavators Composite		0.1300	0.5401	0.9817	0.0013	0.0536	0.0493	120	0.0117	0.0052	121.4
Forklifts	50	0.0514	0.1682	0.1488	0.0002	0.0136	0.0126	14.7	0.0046	0.0021	15.4
	80	0.0503	0.1902	0.2143	0.0003	0.0197	0.0181	21.7661	0.0045	0.0020	22.4676
	120	0.0489	0.2195	0.3017	0.0004	0.0277	0.0255	31.2	0.0044	0.0020	31.9
	175	0.0624	0.3304	0.4664	0.0006	0.0278	0.0256	56.1	0.0056	0.0025	56.9
	250	0.0595	0.1638	0.5872	0.0009	0.0187	0.0172	77.1	0.0054	0.0024	78.0
	500	0.0806	0.2241	0.7257	0.0011	0.0252	0.0232	111	0.0073	0.0032	112.1
Forklifts Composite		0.0585	0.2257	0.4330	0.0006	0.0231	0.0212	54.4	0.0053	0.0023	55.2
Generator Sets	15	0.0157	0.0698	0.1063	0.0002	0.0061	0.0056	10.2	0.0014	0.0006	10.4
	25	0.0276	0.0951	0.1632	0.0002	0.0096	0.0088	17.6	0.0025	0.0011	18.0
	30	0.0413	0.1307	0.1899	0.0003	0.0128	0.0118	20.2297	0.0037	0.0017	20.8054
	50	0.0959	0.2734	0.2966	0.0004	0.0255	0.0234	30.6	0.0087	0.0038	32.0
	120	0.1206	0.4956	0.8099	0.0009	0.0640	0.0589	77.9	0.0109	0.0048	79.6
	175	0.1460	0.7413	1.3131	0.0016	0.0644	0.0593	142	0.0132	0.0059	144.0
	250	0.1372	0.4502	1.8047	0.0024	0.0508	0.0467	213	0.0124	0.0055	214.4
	500	0.1952	0.7617	2.5896	0.0033	0.0756	0.0696	337	0.0176	0.0078	339.6
	750	0.3257	1.2296	4.3019	0.0055	0.1241	0.1142	544	0.0294	0.0131	548.3
	9999	0.8673	3.0642	10.8871	0.0105	0.3104	0.2856	1,049	0.0783	0.0348	1060.7
Generator Sets Composite		0.0832	0.3121	0.5779	0.0007	0.0351	0.0323	61.0	0.0075	0.0033	62.2
Graders	50	0.1182	0.3365	0.2882	0.0004	0.0286	0.0263	27.5	0.0107	0.0047	29.2
	117	0.1341	0.5270	0.7994	0.0009	0.0721	0.0663	72.9323	0.0121	0.0054	74.8023
	120	0.1348	0.5355	0.8223	0.0009	0.0740	0.0681	75.0	0.0122	0.0054	76.8
	175	0.1554	0.7363	1.1931	0.0014	0.0688	0.0633	124	0.0140	0.0062	126.1
	245	0.1573	0.4698	1.5117	0.0019	0.0556	0.0511	168.9	0.0142	0.0063	171.1
	250	0.1575	0.4508	1.5344	0.0019	0.0547	0.0503	172	0.0142	0.0063	174.3
	500	0.1947	0.6639	1.8193	0.0023	0.0671	0.0617	229	0.0176	0.0078	232.2
	750	0.4147	1.4022	3.9602	0.0049	0.1439	0.1324	486	0.0374	0.0166	491.5
Graders Composite		0.1533	0.6129	1.2503	0.0015	0.0649	0.0597	133	0.0138	0.0061	134.9
Off-Highway Tractors	120	0.2224	0.7269	1.2964	0.0011	0.1143	0.1052	93.7	0.0201	0.0089	96.8
	175	0.2135	0.8404	1.6085	0.0015	0.0923	0.0849	130	0.0193	0.0086	133.4
	250	0.1718	0.4896	1.5282	0.0015	0.0644	0.0593	130	0.0155	0.0069	132.8
	750	0.6814	3.0883	6.1417	0.0057	0.2515	0.2313	568	0.0615	0.0273	577.6
	1000	1.0246	4.8137	10.5080	0.0082	0.3620	0.3330	814	0.0924	0.0411	828.6
Off-Highway Tractors Composite		0.2170	0.7878	1.7969	0.0017	0.0871	0.0802	151	0.0196	0.0087	154.5
Off-Highway Trucks	175	0.1533	0.7593	1.1072	0.0014	0.0666	0.0613	125	0.0138	0.0061	127.2
	250	0.1469	0.3944	1.3513	0.0019	0.0461	0.0424	167	0.0133	0.0059	168.6
	325	0.1824	0.6479	1.5046	0.0020	0.0641	0.0590	194.5369	0.0165	0.0073	197.0799
	419	0.2006	0.5781	1.7536	0.0024	0.0626	0.0576	238.1	0.0181	0.0080	240.9
	500	0.2263	0.6661	1.9463	0.0027	0.0705	0.0649	272	0.0204	0.0091	275.5
	750	0.3695	1.0792	3.2612	0.0044	0.1164	0.1071	442	0.0333	0.0148	446.9
	1000	0.5790	1.7854	6.4025	0.0063	0.1933	0.1778	625	0.0522	0.0232	632.8
Off-Highway Trucks Composite		0.2241	0.6635	2.0158	0.0027	0.0715	0.0657	260	0.0202	0.0090	263.2
Other Construction Equipment	15	0.0118	0.0617	0.0737	0.0002	0.0028	0.0026	10.1	0.0011	0.0005	10.3
	20	0.0139	0.0581	0.0878	0.0002	0.0036	0.0033	11.7	0.0013	0.0006	11.9
	25	0.0160	0.0544	0.1019	0.0002	0.0044	0.0041	13.2	0.0014	0.0006	13.4
	50	0.0842	0.2740	0.2707	0.0004	0.0228	0.0210	28.0	0.0076	0.0034	29.2
	120	0.1104	0.5320	0.7540	0.0009	0.0633	0.0583	80.9	0.0100	0.0044	82.4
	175	0.1008	0.5880	0.8599	0.0012	0.0467	0.0430	107	0.0091	0.0040	107.9
	500	0.1517	0.5426	1.6573	0.0025	0.0545	0.0502	254	0.0137	0.0061	256.4
Other Construction Equipment Composite		0.0925	0.3847	0.8599	0.0013	0.0366	0.0337	123	0.0083	0.0037	124.0
Other General Industrial Equipment	5	0.0022	0.0130	0.0155	0.0000	0.0006	0.0006	2.1	0.0002	0.0001	2.2
	8	0.0035	0.0208	0.0249	0.0001	0.0010	0.0009	3.4	0.0003	0.0001	3.5
	15	0.0066	0.0391	0.0466	0.0001	0.0018	0.0017	6.4	0.0006	0.0003	6.5
	25	0.0185	0.0632	0.1170	0.0002	0.0045	0.0041	15.3	0.0017	0.0007	15.6
	50	0.1085	0.2856	0.2332	0.0003	0.0253	0.0233	21.7	0.0098	0.0044	23.3
	120	0.1274	0.4542	0.7277	0.0007	0.0703	0.0647	62.0	0.0115	0.0051	63.8
	175	0.1349	0.5757	1.0001	0.0011	0.0599	0.0551	95.9	0.0122	0.0054	97.8
	204	0.1305	0.4799	1.1154	0.0013	0.0529	0.0486	111.3	0.0118	0.0052	113.1
	250	0.1235	0.3281	1.2983	0.0015	0.0417	0.0383	136	0.0111	0.0050	137.3
	260	0.1275	0.3421	1.3359	0.0016	0.0430	0.0396	140.8	0.0115	0.0051	142.6
	500	0.2232	0.6772	2.2367	0.0026	0.0758	0.0698	265	0.0201	0.0090	268.5
	515	0.2321	0.7035	2.3306	0.0027	0.0789	0.0726	275.7	0.0209	0.0093	279.0
	750	0.3707	1.1162	3.8016	0.0044	0.1273	0.1171	437	0.0334	0.0149	442.6
	1000	0.5621	1.8453	6.4018	0.0056	0.1947	0.1791	560	0.0507	0.0225	567.4
	1050	0.5902	1.9376	6.7219	0.0059	0.2044	0.1881	587.5833	0.0533	0.0237	595.8
Other General Industrial Equipment Composite		0.1635	0.5362	1.4520	0.0016	0.0632	0.0582	152	0.0148	0.0066	154.5

**SCAB Fleet Average Emission Factors (Diesel)**

Offroad 2012

Interpolation / Extrapolation

Air Basin SC

Equipment	MaxHP	(lb/hr) ROG	(lb/hr) CO	(lb/hr) NOX	(lb/hr) SOX	(lb/hr) PM10	(lb/hr) PM2.5	(lb/hr) CO2	(lb/hr) CH4	(lb/hr) N2O	(lb/hr) CO2 eqv
Other Material Handling Equipment	50	0.1506	0.3950	0.3243	0.0004	0.0352	0.0323	30.3	0.0136	0.0060	32.4
	120	0.1239	0.4423	0.7103	0.0007	0.0684	0.0630	60.7	0.0112	0.0050	62.4
	175	0.1703	0.7292	1.2706	0.0014	0.0759	0.0698	122	0.0154	0.0068	124.5
	250	0.1305	0.3496	1.3863	0.0016	0.0443	0.0408	145	0.0118	0.0052	146.8
	500	0.1590	0.4876	1.6124	0.0019	0.0545	0.0501	192	0.0143	0.0064	193.8
	9999	0.7467	2.4395	8.4619	0.0073	0.2565	0.2360	741	0.0674	0.0299	751.8
Other Material Handling Equipment Composite		0.1566	0.5108	1.4125	0.0015	0.0613	0.0564	141	0.0141	0.0063	143.4
Pavers	25	0.0255	0.0811	0.1531	0.0002	0.0080	0.0074	18.7	0.0023	0.0010	19.0
	50	0.1451	0.3680	0.3038	0.0004	0.0327	0.0301	28.0	0.0131	0.0058	30.0
	120	0.1467	0.5107	0.8788	0.0008	0.0776	0.0714	69.2	0.0132	0.0059	71.2
	175	0.1864	0.7833	1.4495	0.0014	0.0819	0.0753	128	0.0168	0.0075	130.9
	250	0.2182	0.6365	2.0698	0.0022	0.0818	0.0753	194	0.0197	0.0087	197.4
	500	0.2383	0.9957	2.2418	0.0023	0.0883	0.0812	233	0.0215	0.0096	236.6
Pavers Composite		0.1596	0.5445	0.8980	0.0009	0.0642	0.0591	77.9	0.0144	0.0064	80.2
Paving Equipment	25	0.0153	0.0520	0.0974	0.0002	0.0042	0.0039	12.6	0.0014	0.0006	12.8
	50	0.1239	0.3124	0.2591	0.0003	0.0279	0.0257	23.9	0.0112	0.0050	25.7
	120	0.1150	0.3997	0.6897	0.0006	0.0610	0.0561	54.5	0.0104	0.0046	56.1
	175	0.1455	0.6114	1.1384	0.0011	0.0640	0.0588	101	0.0131	0.0058	103.1
	250	0.1349	0.3946	1.2976	0.0014	0.0507	0.0466	122	0.0122	0.0054	124.2
Paving Equipment Composite		0.1204	0.4365	0.8114	0.0008	0.0570	0.0525	68.9	0.0109	0.0048	70.6
Plate Compactors	15	0.0050	0.0263	0.0314	0.0001	0.0013	0.0012	4.3	0.0005	0.0002	4.4
Plate Compactors Composite		0.0050	0.0263	0.0314	0.0001	0.0013	0.0012	4.3	0.0005	0.0002	4.4
Pressure Washers	15	0.0075	0.0334	0.0509	0.0001	0.0029	0.0027	4.9	0.0007	0.0003	5.0
	25	0.0112	0.0385	0.0662	0.0001	0.0039	0.0036	7.1	0.0010	0.0004	7.3
	50	0.0349	0.1074	0.1339	0.0002	0.0102	0.0094	14.3	0.0032	0.0014	14.8
	120	0.0332	0.1458	0.2385	0.0003	0.0172	0.0158	24.1	0.0030	0.0013	24.5
Pressure Washers Composite		0.0173	0.0635	0.0921	0.0001	0.0063	0.0058	9.4	0.0016	0.0007	9.7
Pumps	15	0.0133	0.0508	0.0790	0.0001	0.0054	0.0050	7.4	0.0012	0.0005	7.6
	25	0.0386	0.1051	0.1803	0.0002	0.0117	0.0108	19.5	0.0035	0.0015	20.0
	50	0.1155	0.3229	0.3362	0.0004	0.0299	0.0275	34.3	0.0104	0.0046	35.9
	120	0.1250	0.5036	0.8226	0.0009	0.0669	0.0615	77.9	0.0113	0.0050	79.7
	175	0.1498	0.7431	1.3164	0.0016	0.0664	0.0611	140	0.0135	0.0060	142.2
	250	0.1357	0.4345	1.7375	0.0023	0.0501	0.0461	201	0.0122	0.0054	203.3
	500	0.2089	0.8032	2.6861	0.0034	0.0803	0.0739	345	0.0188	0.0084	348.1
	750	0.3557	1.3279	4.5700	0.0057	0.1350	0.1242	571	0.0321	0.0143	575.7
	9999	1.1456	4.0641	14.2305	0.0136	0.4081	0.3754	1,355	0.1034	0.0459	1370.8
Pumps Composite		0.0813	0.2983	0.4999	0.0006	0.0351	0.0323	49.6	0.0073	0.0033	50.7
Rollers	15	0.0074	0.0386	0.0461	0.0001	0.0018	0.0016	6.3	0.0007	0.0003	6.4
	25	0.0162	0.0549	0.1029	0.0002	0.0045	0.0041	13.3	0.0015	0.0006	13.6
	50	0.1105	0.2994	0.2677	0.0003	0.0263	0.0242	26.0	0.0100	0.0044	27.5
	120	0.1054	0.4098	0.6619	0.0007	0.0574	0.0528	59.0	0.0095	0.0042	60.5
	130	0.1103	0.4484	0.7366	0.0008	0.0577	0.0531	67.9	0.0100	0.0044	69.5
	175	0.1320	0.6220	1.0725	0.0012	0.0591	0.0544	108	0.0119	0.0053	110.0
	250	0.1347	0.4083	1.4103	0.0017	0.0498	0.0459	153	0.0122	0.0054	155.0
	354	0.1517	0.5193	1.5763	0.0019	0.0562	0.0517	180.6	0.0137	0.0061	182.7
	500	0.1755	0.6752	1.8093	0.0022	0.0652	0.0600	219	0.0158	0.0070	221.5
Rollers Composite		0.1038	0.4107	0.6936	0.0008	0.0488	0.0449	67.1	0.0094	0.0042	68.5
Rough Terrain Forklifts	50	0.1315	0.3910	0.3455	0.0004	0.0330	0.0304	33.9	0.0119	0.0053	35.7
	120	0.1038	0.4364	0.6425	0.0007	0.0585	0.0538	62.4	0.0094	0.0042	63.9
	175	0.1444	0.7268	1.1204	0.0014	0.0652	0.0600	125	0.0130	0.0058	126.9
	250	0.1353	0.3896	1.4082	0.0019	0.0458	0.0421	171	0.0122	0.0054	172.7
	500	0.1894	0.5985	1.8577	0.0025	0.0642	0.0591	257	0.0171	0.0076	259.2
Rough Terrain Forklifts Composite		0.1093	0.4680	0.6995	0.0008	0.0587	0.0540	70.3	0.0099	0.0044	71.8
Rubber Tired Dozers	175	0.2209	0.8528	1.6304	0.0015	0.0945	0.0869	129	0.0199	0.0089	132.6
	250	0.2545	0.7124	2.1985	0.0021	0.0942	0.0867	183	0.0230	0.0102	187.0
	500	0.3345	1.5220	2.8822	0.0026	0.1210	0.1113	265	0.0302	0.0134	269.5
	750	0.5042	2.2809	4.4100	0.0040	0.1832	0.1685	399	0.0455	0.0202	405.8
	1000	0.7807	3.6654	7.7816	0.0060	0.2729	0.2510	592	0.0704	0.0313	602.8
Rubber Tired Dozers Composite		0.3114	1.2491	2.6866	0.0025	0.1137	0.1046	239	0.0281	0.0125	243.4
Rubber Tired Loaders	25	0.0205	0.0697	0.1295	0.0002	0.0052	0.0048	16.9	0.0018	0.0008	17.2
	50	0.1315	0.3756	0.3242	0.0004	0.0319	0.0293	31.1	0.0119	0.0053	33.0
	120	0.1045	0.4187	0.6404	0.0007	0.0576	0.0530	58.9	0.0094	0.0042	60.4
	175	0.1312	0.6288	1.0135	0.0012	0.0583	0.0536	106	0.0118	0.0053	108.1
	182	0.1314	0.6059	1.0414	0.0012	0.0572	0.0526	110.3	0.0119	0.0053	112.1
	250	0.1330	0.3838	1.3129	0.0017	0.0462	0.0425	149	0.0120	0.0053	150.8
	349	0.1580	0.4993	1.5278	0.0019	0.0547	0.0504	183.8	0.0143	0.0063	186.0
	500	0.1961	0.6755	1.8555	0.0023	0.0677	0.0623	237	0.0177	0.0079	239.7
	750	0.4044	1.3812	3.9115	0.0049	0.1408	0.1296	486	0.0365	0.0162	491.2
	1000	0.5480	1.9543	6.3337	0.0060	0.1909	0.1756	594	0.0494	0.0220	601.5
Rubber Tired Loaders Composite		0.1272	0.4855	1.0034	0.0012	0.0558	0.0513	109	0.0115	0.0051	110.4
Scrapers	120	0.1990	0.7011	1.1749	0.0011	0.1054	0.0970	93.9	0.0180	0.0080	96.7
	175	0.2172	0.9158	1.6429	0.0017	0.0945	0.0870	148	0.0196	0.0087	151.1
	250	0.2367	0.6699	2.1849	0.0024	0.0859	0.0790	209	0.0214	0.0095	212.8
	500	0.3333	1.3000	3.0162	0.0032	0.1190	0.1095	321	0.0301	0.0134	326.1
	750	0.5779	2.2380	5.3231	0.0056	0.2075	0.1909	555	0.0521	0.0232	563.3



**SCAB Fleet Average Emission Factors (Diesel)**

Offroad 2012

Interpolation / Extrapolation

Air Basin SC

Equipment	MaxHP	(lb/hr) ROG	(lb/hr) CO	(lb/hr) NOX	(lb/hr) SOX	(lb/hr) PM10	(lb/hr) PM2.5	(lb/hr) CO2	(lb/hr) CH4	(lb/hr) N2O	(lb/hr) CO2 eqv
Scrapers Composite		0.2916	1.0984	2.5680	0.0027	0.1087	0.1000	262	0.0263	0.0117	266.6
Signal Boards	15	0.0072	0.0377	0.0450	0.0001	0.0017	0.0016	6.2	0.0006	0.0003	6.3
	50	0.1270	0.3587	0.3564	0.0005	0.0324	0.0298	36.2	0.0115	0.0051	38.0
	120	0.1284	0.5269	0.8360	0.0009	0.0703	0.0647	80.2	0.0116	0.0051	82.0
	175	0.1661	0.8370	1.4268	0.0017	0.0750	0.0690	155	0.0150	0.0067	156.9
	250	0.1746	0.5516	2.1599	0.0029	0.0639	0.0588	255	0.0158	0.0070	257.7
Signal Boards Composite		0.0203	0.0940	0.1470	0.0002	0.0083	0.0076	16.7	0.0018	0.0008	17.0
Skid Steer Loaders	25	0.0211	0.0635	0.1189	0.0002	0.0067	0.0062	13.8	0.0019	0.0008	14.1
	50	0.0596	0.2332	0.2402	0.0003	0.0180	0.0166	25.5	0.0054	0.0024	26.4
	74	0.0557	0.2482	0.2791	0.0004	0.0217	0.0199	31.4	0.0050	0.0022	32.2
	90	0.0531	0.2582	0.3050	0.0004	0.0241	0.0221	35.4	0.0048	0.0021	36.1
	120	0.0482	0.2769	0.3536	0.0005	0.0286	0.0263	42.8	0.0043	0.0019	43.4
Skid Steer Loaders Composite		0.0534	0.2360	0.2886	0.0004	0.0207	0.0190	30.3	0.0048	0.0021	31.0
Surfacing Equipment	50	0.0513	0.1441	0.1411	0.0002	0.0128	0.0118	14.1	0.0046	0.0021	14.8
	120	0.1040	0.4251	0.6895	0.0007	0.0557	0.0513	63.8	0.0094	0.0042	65.2
	175	0.0950	0.4745	0.8195	0.0010	0.0422	0.0388	85.8	0.0086	0.0038	87.1
	250	0.1095	0.3526	1.1993	0.0015	0.0413	0.0380	135	0.0099	0.0044	136.4
	500	0.1631	0.6813	1.7819	0.0022	0.0622	0.0572	221	0.0147	0.0065	223.5
	750	0.2601	1.0660	2.8642	0.0035	0.0986	0.0907	347	0.0235	0.0104	350.7
Surfacing Equipment Composite		0.1362	0.5467	1.3678	0.0017	0.0512	0.0471	166	0.0123	0.0055	167.9
Sweepers/Scrubbers	15	0.0124	0.0729	0.0870	0.0002	0.0034	0.0031	11.9	0.0011	0.0005	12.1
	25	0.0237	0.0808	0.1501	0.0002	0.0060	0.0055	19.6	0.0021	0.0010	19.9
	50	0.1195	0.3565	0.3179	0.0004	0.0302	0.0278	31.6	0.0108	0.0048	33.2
	120	0.1233	0.5204	0.7534	0.0009	0.0706	0.0649	75.0	0.0111	0.0049	76.8
	175	0.1575	0.8008	1.2212	0.0016	0.0717	0.0660	139	0.0142	0.0063	141.2
	250	0.1205	0.3447	1.3019	0.0018	0.0402	0.0370	162	0.0109	0.0048	163.7
Sweepers/Scrubbers Composite		0.1278	0.5215	0.7403	0.0009	0.0576	0.0530	78.5	0.0115	0.0051	80.3
Tractors/Loaders/Backhoes	25	0.0199	0.0662	0.1250	0.0002	0.0061	0.0056	15.9	0.0018	0.0008	16.1
	50	0.1006	0.3305	0.3030	0.0004	0.0267	0.0245	30.3	0.0091	0.0040	31.7
	120	0.0760	0.3557	0.4910	0.0006	0.0432	0.0397	51.7	0.0069	0.0030	52.8
	175	0.1058	0.5866	0.8294	0.0011	0.0478	0.0440	101	0.0095	0.0042	102.9
	250	0.1264	0.3755	1.2813	0.0019	0.0415	0.0382	172	0.0114	0.0051	173.5
	500	0.2386	0.7714	2.2621	0.0039	0.0784	0.0722	345	0.0215	0.0096	348.2
	750	0.3611	1.1563	3.5105	0.0058	0.1199	0.1103	517	0.0326	0.0145	522.3
Tractors/Loaders/Backhoes Composite		0.0862	0.3824	0.5816	0.0008	0.0435	0.0401	66.8	0.0078	0.0035	68.0
Trenchers	15	0.0099	0.0517	0.0617	0.0001	0.0024	0.0022	8.5	0.0009	0.0004	8.6
	25	0.0398	0.1355	0.2519	0.0004	0.0101	0.0093	32.9	0.0036	0.0016	33.5
	50	0.1656	0.4176	0.3536	0.0004	0.0374	0.0344	32.9	0.0149	0.0066	35.2
	120	0.1354	0.4732	0.8257	0.0008	0.0709	0.0652	64.9	0.0122	0.0054	66.8
	175	0.2050	0.8694	1.6306	0.0016	0.0901	0.0829	144	0.0185	0.0082	146.8
	250	0.2483	0.7418	2.3854	0.0025	0.0951	0.0875	223	0.0224	0.0100	226.4
	500	0.3135	1.4011	3.0220	0.0031	0.1190	0.1095	311	0.0283	0.0126	315.7
	750	0.5949	2.6307	5.8034	0.0059	0.2259	0.2078	587	0.0537	0.0239	595.2
Trenchers Composite		0.1507	0.4749	0.6995	0.0007	0.0582	0.0536	58.7	0.0136	0.0060	60.8
Welders	15	0.0111	0.0425	0.0660	0.0001	0.0045	0.0042	6.2	0.0010	0.0004	6.4
	25	0.0224	0.0609	0.1044	0.0001	0.0068	0.0062	11.3	0.0020	0.0009	11.6
	47	0.0969	0.2585	0.2446	0.0003	0.0237	0.0218	24.2	0.0087	0.0039	25.5
	50	0.1071	0.2854	0.2637	0.0003	0.0260	0.0239	26.0	0.0097	0.0043	27.5
	120	0.0708	0.2687	0.4376	0.0005	0.0387	0.0356	39.5	0.0064	0.0028	40.5
	175	0.1183	0.5475	0.9688	0.0011	0.0531	0.0489	98.2	0.0107	0.0047	99.8
	250	0.0909	0.2704	1.0791	0.0013	0.0329	0.0303	119	0.0082	0.0036	120.3
	500	0.1154	0.4072	1.3538	0.0016	0.0431	0.0396	168	0.0104	0.0046	169.2
Welders Composite		0.0703	0.2150	0.2702	0.0003	0.0243	0.0224	25.6	0.0063	0.0028	26.6

Source: SCAQMD 2008

Notes:

Offroad diesel exhaust PM<sub>2.5</sub> = 92% of PM<sub>10</sub> per EMFAC 2007 version 2.3

Non-matching application-specific values interpolated or extrapolated

Offroad N<sub>2</sub>O per Annex 3, Table A-101

**SCAB Fleet Average Emission Factors****Onroad 2012****Air Basin**      **SC**

Vehicle Type	(lb/mi) ROG	(lb/mi) CO	(lb/mi) NOX	(lb/mi) SOX	(lb/mi) PM10	(lb/mi) PM2.5	(lb/mi) CO2	(lb/mi) CH4	(lb/mi) N2O	(lb/mi) CO2 eqv
Light Duty (pickup trucks)	0.000796	0.007655	0.000776	0.000011	0.000090	0.000057	1.10	0.000072	0.000029	1.11
Medium Duty (work trucks)	0.002238	0.015457	0.017324	0.000027	0.000650	0.000550	2.77	0.000107	0.000166	2.82
Heavy Heavy Duty (tractor/trailers)	0.002528	0.010215	0.030924	0.000040	0.001496	0.001294	4.22	0.000117	0.000110	4.25

Notes:

SCAQMD 2008

HHD includes tire &amp; brake wear

Onroad N<sub>2</sub>O per Annex 3, Table A-99

**Highest (Most Conservative) EMFAC2007 (version 2.3)  
Emission Factors for On-Road Passenger Vehicles & Delivery Trucks**  
Projects in the SCAQMD (Scenario Years 2007 - 2026)  
Derived from Peak Emissions Inventory (**Winter**, **Annual**, **Summer**)

**Vehicle Class:**

**Passenger Vehicles (<8500 pounds) & Delivery Trucks (>8500 pounds)**

Scenario Year: **2011**

All model years in the range 1967 to 2011

Passenger Vehicles (pounds/mile)		Delivery Trucks (pounds/mile)	
CO	0.00826276	CO	0.01693242
NOx	0.00084460	NOx	0.01893366
ROG	0.00085233	ROG	0.00241868
SOx	0.00001077	SOx	0.00002728
PM10	0.00008879	PM10	0.00070097
PM2.5	0.00005653	PM2.5	0.00059682
CO2	1.10235154	CO2	2.75180822
CH4	0.00007678	CH4	0.00011655

Scenario Year: **2012**

All model years in the range 1968 to 2012

Passenger Vehicles (pounds/mile)		Delivery Trucks (pounds/mile)	
CO	0.00765475	CO	0.01545741
NOx	0.00077583	NOx	0.01732423
ROG	0.00079628	ROG	0.00223776
SOx	0.00001073	SOx	0.00002667
PM10	0.00008979	PM10	0.00064975
PM2.5	0.00005750	PM2.5	0.00054954
CO2	1.10152540	CO2	2.76628414
CH4	0.00007169	CH4	0.00010668

Scenario Year: **2013**

All model years in the range 1969 to 2013

Passenger Vehicles (pounds/mile)		Delivery Trucks (pounds/mile)	
CO	0.00709228	CO	0.01407778
NOx	0.00071158	NOx	0.01577311
ROG	0.00074567	ROG	0.00206295
SOx	0.00001072	SOx	0.00002682
PM10	0.00009067	PM10	0.00059956
PM2.5	0.00005834	PM2.5	0.00050174
CO2	1.10087435	CO2	2.78163459
CH4	0.00006707	CH4	0.00009703

Scenario Year: **2014**

All model years in the range 1970 to 2014

Passenger Vehicles (pounds/mile)		Delivery Trucks (pounds/mile)	
CO	0.00660353	CO	0.01284321
NOx	0.00065484	NOx	0.01425162
ROG	0.00070227	ROG	0.00189649
SOx	0.00001069	SOx	0.00002754
PM10	0.00009185	PM10	0.00054929
PM2.5	0.00005939	PM2.5	0.00045519
CO2	1.10257205	CO2	2.79845465
CH4	0.00006312	CH4	0.00008798

Scenario Year: **2015**

All model years in the range 1971 to 2015

Passenger Vehicles (pounds/mile)		Delivery Trucks (pounds/mile)	
CO	0.00614108	CO	0.01169445
NOx	0.00060188	NOx	0.01285026
ROG	0.00066355	ROG	0.00173890
SOx	0.00001070	SOx	0.00002741
PM10	0.00009259	PM10	0.00050307
PM2.5	0.00006015	PM2.5	0.00041268
CO2	1.10192837	CO2	2.81247685
CH4	0.00005923	CH4	0.00008076

Scenario Year: **2016**

All model years in the range 1972 to 2016

Passenger Vehicles (pounds/mile)		Delivery Trucks (pounds/mile)	
CO	0.00575800	CO	0.01080542
NOx	0.00055658	NOx	0.01172881
ROG	0.00063254	ROG	0.00161521
SOx	0.00001071	SOx	0.00002767
PM10	0.00009392	PM10	0.00046606
PM2.5	0.00006131	PM2.5	0.00037868
CO2	1.10677664	CO2	2.83134285
CH4	0.00005623	CH4	0.00007355

## Highest (Most Conservative) EMFAC2007 (version 2.3) Emission Factors for On-Road Heavy-Heavy-Duty Diesel Trucks

Projects in the SCAQMD (Scenario Years 2007 - 2026)  
Derived from Peak Emissions Inventory (**Winter**, **Annual**, **Summer**)

### Vehicle Class:

### Heavy-Heavy-Duty Diesel Trucks (33,001 to 60,000 pounds)

Scenario Year: **2011**

All model years in the range 1967 to 2011

HHDT-DSL (pounds/mile)	
CO	0.01112463
NOx	0.03455809
ROG	0.00279543
SOx	0.00003972
PM10	0.00166087
PM2.5	0.00144489
CO2	4.22045680
CH4	0.00012910

HHDT-DSL, Exh (pounds/mile)	
PM10	0.00151936
PM2.5	0.00139772

Scenario Year: **2012**

All model years in the range 1968 to 2012

HHDT-DSL (pounds/mile)	
CO	0.01021519
NOx	0.03092379
ROG	0.00252764
SOx	0.00004042
PM10	0.00149566
PM2.5	0.00129354
CO2	4.21590774
CH4	0.00011651

HHDT-DSL, Exh (pounds/mile)	
PM10	0.00135537
PM2.5	0.00124837

Scenario Year: **2013**

All model years in the range 1969 to 2013

HHDT-DSL (pounds/mile)	
CO	0.00931790
NOx	0.02742935
ROG	0.00226308
SOx	0.00004086
PM10	0.00133697
PM2.5	0.00114629
CO2	4.21518556
CH4	0.00010441

HHDT-DSL, Exh (pounds/mile)	
PM10	0.00119623
PM2.5	0.00109863

Scenario Year: **2014**

All model years in the range 1970 to 2014

HHDT-DSL (pounds/mile)	
CO	0.00846435
NOx	0.02418049
ROG	0.00201594
SOx	0.00004092
PM10	0.00118458
PM2.5	0.00100582
CO2	4.21279345
CH4	0.00009261

HHDT-DSL, Exh (pounds/mile)	
PM10	0.00104243
PM2.5	0.00096059

Scenario Year: **2015**

All model years in the range 1971 to 2015

HHDT-DSL (pounds/mile)	
CO	0.00766891
NOx	0.02122678
ROG	0.00178608
SOx	0.00004082
PM10	0.00104715
PM2.5	0.00087977
CO2	4.20902225
CH4	0.00008369

HHDT-DSL, Exh (pounds/mile)	
PM10	0.00090631
PM2.5	0.00083282

Scenario Year: **2016**

All model years in the range 1972 to 2016

HHDT-DSL (pounds/mile)	
CO	0.00704604
NOx	0.01887374
ROG	0.00161035
SOx	0.00003952
PM10	0.00094448
PM2.5	0.00078443
CO2	4.21063031
CH4	0.00007508

HHDT-DSL, Exh (pounds/mile)	
PM10	0.00080419
PM2.5	0.00073898