Statement of Basis

Final

EC **Ralph L. Wadsworth Construction, Inc.**
Declo, Idaho
Facility ID No. 777-00482
Permit to Construct P-2010.0024

March 11, 2010
Eric Clark
Permit Writer

The purpose of this Statement of Basis is to satisfy the requirements of IDAPA 58.01.01.et seq, Rules for the Control of Air Pollution in Idaho, for issuing air permits.

ACRONYMS, UNITS, AND CHEMICAL NOMENCLATURE

AAC	acceptable ambient concentrations for non-carcinogens
AACC	acceptable ambient concentrations for carcinogens
acfm	actual cubic feet per minute
AFS	AIRS Facility Subsystem
AIRS	Aerometric Information Retrieval System
AQCR	Air Quality Control Region
ASTM	American Society for Testing and Materials
BMP	best management practices
Btu	British thermal units
Btu/lb	British thermal units per pound
CAA	Clean Air Act
CAM	Compliance Assurance Monitoring
CBP	concrete batch plant
CFR	Code of Federal Regulations
CI	compression ignition
CO	carbon monoxide
cy/day	cubic yard per day
cy/hr	cubic yard per hour
cy/yr	cubic yard per year
DEQ	Department of Environmental Quality
dscf	dry standard cubic feet
EF	Emission Factor
EI	Emission Inventory
EL	screening emission levels
EPA	U.S. Environmental Protection Agency
g/kW-hr	gram per kilowatt hour
gr	grain (1 lb = 7,000 grains)
HAP	hazardous air pollutants
hp	horsepower
hr/yr	hours per year
ICE	internal combustion engines
IDAPA	a numbering designation for all administrative rules in Idaho promulgated in accordance with the Idaho Administrative Procedures Act
km	kilometers
kW	kilowatts
lb/cy	pound per cubic yard
lb/10^3 gal	pound per thousand gallons
lb/gal	pound per gallon
lb/hr	pounds per hour
lb/MMBtu	pound per million British thermal unit
lb/qtr	pound per quarter
m	meters
MACT	Maximum Achievable Control Technology
MMBtu	million British thermal units
MMscf/hr	million standard cubic feet per hour
MMscf	million standard cubic feet
NAAQS	National Ambient Air Quality Standard
NAICS	North American Industry Classification System
NESHAP	National Emission Standards for Hazardous Air Pollutants
NO_2	nitrogen dioxide
NO_X	nitrogen oxides

NSPS	New Source Performance Standards
PAH	polyaromatic hydrocarbons
PC	permit condition
PERF	Portable Equipment Relocation Form
PM	particulate matter
PM_{10}	particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers
POM	polycyclic organic matter
ppm	parts per million
PSD	Prevention of Significant Deterioration
PTC	permit to construct
PTE	potential to emit
Rules	Rules for the Control of Air Pollution in Idaho
scf	standard cubic feet
SCL	significant contribution limits
SIC	Standard Industrial Classification
SIP	State Implementation Plan
SO_2	sulfur dioxide
SO_X	sulfur oxides
T/yr	tons per consecutive 12-calendar month period
T2	Tier II operating permit
TAP	toxic air pollutants
UTM	Universal Transverse Mercator
VOC	volatile organic compounds
$\mu g/m^3$	micrograms per cubic meter

FACILITY INFORMATION

Description

The facility is a portable central mix concrete batch plant consisting of aggregate stockpiles, a cement storage silo, a cement supplement (flyash) storage silo, a weigh batcher, and conveyors. The facility combines aggregate, flyash, and cement and transfers the mixture into a central drum along with a measured amount of water for stationary mixing of the concrete. Concrete is then transferred to trucks for transport off-site. Power will be supplied to the facility via a Caterpillar C18, 1,004 bhp rated engine. Other power generation will also be performed by a MQ Power 126 bhp rated engine.

The facility will initially be operating off of Interstate 84 near Declo with production limits of 220 cy/hour and 72,000 cy/day. Ralph L. Wadsworth Construction, Inc. also requested flexibility to move throughout the State of Idaho. The submitted application and accompanying modeling only included a compliance demonstration with the Declo site. Therefore, Idaho DEQ discussed a variety of options with the facility that involved prior analysis conducted by the Department. This analysis included modeling compliance demonstration under certain restraints and criteria.

The facility agreed to the following criteria for any future locations within the State of Idaho:

- Throughput limits of 500, 1,000, 1,500 and 2,500 cy/day and 150,000 cy/yr
- Setback distances of 192 feet up to 419 feet (Setback is dependent on selected throughput)
- 99% control as all emissions are routed through a baghouse
- IC Diesel Engines usage reduced to 4,380 hr/yr
- If a diesel boiler is added, it is limited to 156, 430 gal/yr and a maximum heat input of 5 MMBtu/hr

Application Scope

This permit is the initial PTC for this facility.

The applicant has proposed to:

Install and operate a central mix concrete batch plant with two IC diesel engines and a potential diesel boiler in the future.

Application Chronology

February 16, 2010	DEQ received an application and an application fee.
February 22 – March 9, 2010	DEQ provided an opportunity to request a public comment period on the application and proposed permitting action.
March 8, 2010	DEQ received supplemental information from the applicant.
March 17, 2010	DEQ determined that the application was complete.
March 17, 2010	DEQ made available the draft permit and statement of basis for peer and regional office review.
March 22, 2010	DEQ made available the draft permit and statement of basis for applicant review.
April 5, 2010	DEQ received the permit processing fee.
April 5, 2010	DEQ issued the final permit and statement of basis.

TECHNICAL ANALYSIS

Emissions Units and Control Devices

Table 1 CONCRETE BATCH PLANT AND CONTROL DEVICE INFORMATION

Emissions Unit Description	Control Device Description	Emissions Discharge Point ID No. and/or Description
Concrete Batch Plant – Central Mix Manufacturer: Erie Strayer Model: MG 8201 Manufacture Date: 2008 Maximum capacity: 280 cy/hr	Cement Storage Silo Baghouse No. 1[a]: Manufacturer: C&W Model: RA-280C 144 bags 8' x 9.6' baghouse Weigh Batcher Baghouse: All emissions are routed and vented back to baghouse Material Transfer Point Water Sprays or Equivalent	Baghouse No. 1 stack Control efficiency: 99% Materials Transfer: Control Efficiency: 75%
5 MMBtu/hr diesel-fired boiler[b]	None	Stack height: unknown feet Stack diameter unknown inches
IC Diesel Engines (or equivalent[c]) Caterpillar C18 1,004 bhp rated engine John Deere 126 bhp rated engine	none	1,004 bhp Engine Stack height: 12.5 feet Stack diameter 9.96 inches 126 bhp Engine Stack height: 6 feet Stack diameter 4 inches

a. Both the storage silo baghouse is considered process equipment therefore there is no associated control efficiency. PM_{10} controlled emission factors were used when determining PTE and for modeling purposes.
b. The boiler is assumed at 5 MMBtu/hr because that is the maximum size available for the general concrete batch plant permit.
c. "or equivalent" is defined as equipment which has an equivalent or less brake horsepower than listed in this table, which does not result in an increase in emissions, and which does not result in the emission of a toxic air pollutant not previously emitted.

Emissions Inventories

The following discussion outlines the emissions of the Ralph L. Wadsworth Construction Concrete Batch Plant under a worst-case scenario when operating in any future sites. A discussion regarding the emissions at the initial Interstate 84 site follows.

Potential Future Locations

The emissions inventory of this portable concrete batch plant was developed by DEQ based on AP-42 Section 11.12 emission factors for a central-mix concrete batch plant and the following assumptions: 200 cy per hour concrete production capacity and concrete production limits of 150,000 cy per year. Baghouse/cartridge filter capture efficiencies were presumed to be 99.0% in DEQ's generic emissions estimation. This assumes worst case emissions associated with the concrete batch plant.

The emissions inventory developed by DEQ assumed a 5.0 MMBtu/hr diesel-fired boiler and a 1,000 kW diesel-fired internal combustion engine. AP-42 Section 3.4 Large Stationary Diesel and All Stationary Dual-fuel Engines was used to determine both criteria and TAPs emissions from the diesel-fired engine. AP-42 Section 1.3, Fuel Oil Combustion was used to calculate emissions from the diesel-fired boiler. Both emissions calculations were based on diesel fuel to represent a worst-case scenario.

Fugitive emissions of particulate matter (PM) and PM_{10} from batch plant material transfer points were assumed to be controlled by manual water sprays, sprinklers, or spray bars, or an equivalent method (e.g., enclosing the entire process inside a building) that reduce the emissions by an estimated 75%.

Aggregate is washed before delivery to the batch plant site, and water is used on-site to control the temperature of the aggregate. Particulate matter and PM_{10} emissions from the weigh batcher transfer point are controlled by a baghouse/cartridge, and central mix load-out emissions are controlled by a boot. Capture efficiency of the central mix load-out baghouse or equivalent was estimated 99%.

Controlled emissions of toxic air pollutants (TAPs) were estimated based on the presence of a baghouse on the cement/cement supplement silos, a baghouses/cartridge on the weigh batcher, and 99% control for central mix load-out emissions. Hexavalent chromium content was estimated at 20% of total chromium for cement, and 30% of total chromium for the cement supplement/fly ash. Tables 2 and 3 listed below compare uncontrolled and controlled emissions. Lead emissions are shown in Table 3. Detailed emissions calculations can be found in Appendix A of this document.

Table 2 UNCONTROLLED EMISSIONS ESTIMATES OF PM_{10}

Emissions Unit	Emission Factor[a]	PM_{10}	
	lb/cy	lb/hr	T/yr
Aggregate delivery to ground storage*	0.0031	0.620	0.233
Sand delivery to ground storage*	0.0007	0.140	0.053
Aggregate transfer to conveyor*	0.0031	0.620	0.233
Sand transfer to conveyor*	0.0007	0.140	0.053
Aggregate transfer to elevated storage*	0.0031	0.620	0.233
Sand transfer to elevated storage*	0.0007	0.140	0.053
Cement delivery to Silo (controlled EF because baghouse is process equipment)	0.0001	0.020	0.008
Cement supplement delivery to Silo (controlled EF because baghouse is process equipment)	0.0002	0.040	0.015
Weigh hopper loading (sand & aggregate batcher loading)	0.0040	0.800	0.300
Central mix loading, Table 11.12-2, "0.134 lb/ton of cement+flyash" x ((491 lb cement + 73 lb flyash)/cy concrete) / 2000 lb = 0.0378 lb/cy	0.0378	7.560	2.835
Total, Point Sources		**8.420**	**3.158**
Total, Process Fugitives		**2.280**	**0.858**

a. The EFs were calculated using EFs in lb/ton of material handled from Table 11.12-2, typical composition per cubic yard of concrete (1865 lb aggregate, 1428 lbs sand, 491 lbs cement, 73 lbs cement supplement, and 20 gallons of water = 4024 lb/cy), and closely match Table 11.12-5 values (version 6/06) when rounded to the same number of figures. AP-42 lists the same EFs for uncontrolled and controlled emissions, so control estimates are based on the assumed control levels input on the right hand side of the table.
* Considered fugitive for facility classification purposes.

Table 3 CONTROLLED EMISSIONS ESTIMATES OF PM_{10}

Emissions Unit	Control Assumption	PM_{10}	
	%	lb/hr	T/yr
Aggregate delivery to ground storage*	75	0.155	0.058
Sand delivery to ground storage*	75	0.035	0.013
Aggregate transfer to conveyor*	75	0.155	0.058
Sand transfer to conveyor*	75	0.035	0.013
Aggregate transfer to elevated storage*	75	0.155	0.058
Sand transfer to elevated storage*	75	0.035	0.013
Cement delivery to Silo (controlled EF because baghouse is process equipment)	0	0.02	0.008
Cement supplement delivery to Silo (controlled EF because baghouse is process equipment)	0	0.04	0.015
Weigh hopper loading (sand & aggregate batcher loading)	99	0.008	0.003
Central mix loading, Table 11.12-2, "0.134 lb/ton of cement+flyash" x ((491 lb cement + 73 lb flyash)/cy concrete) / 2000 lb = 0.0378 lb/cy	99	0.076	0.028
Total, Point Sources		**0.144**	**0.054**
Total, Process Fugitives		**0.570**	**0.213**

Table 4 LEAD EMISSIONS ESTIMATES CONTROLLED

Emissions Unit	Emission Factor	Lead	
	lb/ton	lb/hr	T/yr
Cement Delivery to silo (controlled EF because baghouse is process equipment)	1.09E-08	5.35E-07[a]	2.34E-06[d]
Cement supplement delivery to Silo (controlled EF because baghouse is process equipment)	5.20E-07	3.80E-06[b]	1.66E-05[d]
Central load-out*	3.82E-07	2.15E-07[c]	1.90E-05[e]
Total, Point sources		**4.34E-06**	**1.89E-05**
Total, Process Fugitives		**2.15E-07**	**1.90E-05**

*Considered fugitive for facility classification purposes.
a. lb/hr = EF * pounds cement x max hourly production rate /2000 lb/T, where cement is 491 pounds per AP-42 Table 11.12-2
b. lb/hr = EF * pounds cement x max hourly production rate /2000 lb/T, where supplement cement is 73 pounds per AP-42 Table 11.12-2
c. lb/hr = EF * pounds cement x max hourly production rate /2000 lb/T, where cement is 491 pounds + 73 pounds supplement per AP-42 Table 11.12-2 x 99% efficiency. The EF is assumed to be uncontrolled.
d. T/yr = EF * pounds cement x hourly production rate x 8,760 hr/yr /2000 lb/T / 2000 lb/T, where cement is 491 pounds or 73 pounds supplement per AP-42 Table 11.12-2.
e. T/yr = EF * pounds cement x hourly production rate x 8,760 hr/yr /2000 lb/T / 2000 lb/T, where cement is 491 pounds + 73 pounds supplement per AP-42 Table 11.12-2 x 99% efficiency. The EF is assumed to be uncontrolled.

Emissions Inventory for 5.0 MMBtu/hr Boiler

In the future, Ralph L. Wadsworth Construction has the ability to utilize a 5.00 MMBtu/hr diesel-fired boiler. A boiler is not permitted at the initial I-84 Declo site. The boiler will be used on a limited basis and requires a fuel usage limit. The usage is restricted to a maximum of 156,430 gal/yr or an equivalent of 4,380 hr/yr. The following emissions are reflective of that annual use. Note that the boiler does not have any control devices associated with it.

Table 5 UNCONTROLLED CRITERIA POLLUTANTS FROM DIESEL BOILER

Pollutant	Emissions Factor[a]	Emissions[b]	
	lb/10^3 gal	lb/hr	T/yr
NO_x	20	0.714	1.564
CO	5	0.179	0.392
PM_{10}[c]	3.3	0.118	0.258
SO_x[d]	0.216	0.008	0.018
VOC[e]	0.556	0.020	0.044
Lead[f]	9	0.0000450	0.0000986
Total		**1.039**	**2.276**

a. AP-42 Section 1.3 (9/98) is the source of all emission factors.
b. 140 MMBtu/10^3 gal which equated to 3.57E-02 10^3 gal/hr and 4,380 hr/yr was used in the emissions calculation.
c. PM_{10} emission factor assumes the summation of condensable and filterable.
d. SO_x assumes the summation of both SO_2 and SO_3.
e. VOC assumes Total Organic Compounds (TOC).
f. Units are lb/ 10^{12} Btu

Emissions Inventory for 1,004 and 126 bhp, Tier II Certified Engine

Ralph L. Wadsworth Construction has a 1,004 bhp and 126 bhp diesel-fired engine. The engine will be used on a limited basis and requires an hours of operation limit. The usage is restricted to a maximum of 4,380 hr/yr. The following emissions are reflective of that annual use. Note that the engine does not have any control devices associated with it.

Emissions are based on a worst-case scenario using diesel fuel in a Tier II, 1,340 bhp engine. The maximum fuel use rate was calculated in gal/hr and was based on the 1,340 bhp capacity of the engine. The following equation was used to determine the fuel use rate from the fuel heating value and average brake-specific fuel consumption (BSFC). Note that the fuel heating value applied is based on AP-42 Sections 3.3 and 3.4 values of 19,300 Btu/lb and a density of 7.1 lb/gal. The maximum fuel use rate was converted into MMBtu/hr and multiplied by a given emission factor in lb/MMBtu to obtain and emission rate in lb/hr.

$$\max fuel = \frac{(capacity * BSFC)}{(fuelheatin gvalue)} = \frac{(1{,}340 bhp * 7{,}000 Btu / hp - hr)}{(137{,}030 Btu / gal)} = 68.50 gal / hr$$

All emissions were calculated assuming continuous operation. Ralph L. Wadsworth Construction may use any engine of choice, but if the corresponding emissions exceed those of a Tier II, 1,340 bhp the operating hours are reduced. Emission factors are derived from one of three sources. If the engine is uncertified AP-42 factors from Sections 3.3 and 3.4. If the engine is certified as Tier 1-3 or Blue Sky 40 CFR 89 factors were applied. For the more recent Tier 4 engines, 40 CFR 1039 factors were applied. Regardless of the engine used by Ralph L. Wadsworth Construction, the emission thresholds that cannot be exceeded are based on Tier II, 1,340 bhp engines and are illustrated in the following table.

Table 6 UNCONTROLLED CRITERIA POLLUTANTS FROM TIER II, 1,340 bhp DIESEL ENGINE

Pollutant	Emissions Factor[a]	Emissions	
	lb/MMBtu	**lb/hr**	**T/yr**
NO_x	1.50	14.11	30.89
CO	0.82	7.72	16.89
PM_{10}	0.047	0.44	0.97
SO_2	0.015	0.14	0.03
VOC	0.31	2.91	6.37
Total		**25.32**	**55.15**

a. All of the emission factors were derived from 40 CFR 89, Subpart B, Table 1. The emission standards within the table were converted from g/kW-hr to lb/MMBtu using the following equation: g/kW-hr x (lb/453g) x (hp-hr/7000 Btu) x (0.746 kW/hp) x 10^6 Btu/MMBtu = lb/MMBtu.

Emissions Inventory for Transfer Points

Determining emissions from a concrete batch plant also includes transfer emissions from the number of drop points throughout the process. The PM_{10} emissions from Central-Mix loading operations are defined by an equation which includes the wind speed at each drop point and the moisture content of cement and cement supplement and a number of exponents and constants defined by AP-42 Equation 11.12-1. An average value of wind speed and moisture content are 10 mph and 6% respectively[1]. The following equation of particulate emissions is specific to PM_{10}. The resulting emissions were used to determine a wind speed factor to help evaluate variation in AERMOD modeling due to wind speed. When calculating the wind speed factors it was assumed that the transfer points were controlled by a shroud or boot.

$$E = k(0.0032) * \left[\frac{U^a}{M^b} \right] + c$$

Where:
k = particle size multiplier
a = exponent
b = exponent
c = constant
U = mean wind speed
M = moisture content

The second transfer emissions calculations were to determine conveyor emissions. Transfer of both coarse and fine aggregate to a conveyor. It was assumed that 82% or 164 cy/hr of the concrete produced was aggregate. This percentage was based on 1,865 lb coarse aggregate, 1,428 lb sand, 564 lb cement/supplement and 167 lb water for a total of 4,024 lb concrete as defined by AP-42 Table 11.12-5 (06/06). The fine and coarse aggregate contributions were separated into 36% and 46% of the total concrete production. Employing emission factors from AP-42 Table 11.12-5 for conveyor transfer and assuming 75% control efficiency as stated earlier for conveyor transfer PM_{10} emissions were calculated for each transfer point. For both fine and coarse aggregate the facility has 2 transfer points. The following table shows the transfer emissions estimates.

[1] 10 mph was the average wind speed obtained during two separate EPA tests conducted at Cheney enterprises Cement plant in Roanoke,VA, 1994 (AP-42 11-12 06/06). 4.17 % and 1.77% were the average percentages for sand and aggregate respectively. These values are based on EPA tests conducted at Cheney Enterprises

Table 7 TRANSFER POINT EMISSIONS FOR PM_{10}

Pollutant	Emission Factor lb/cy	# of Transfer Pts	Emissions lb/hr	Emissions T/yr
Fine PM_{10}	0.0007	2	0.076	0.0284
Coarse PM_{10}	0.0031	2	0.428	0.1604
Total			**0.504**	**0.189**

Table 8 FACILITY WIDE CRITERIA POLLUTANT EMISSION ESTIMATES

Emissions Unit	PM_{10}	NO_x	CO	SO_2	VOC	Lead
	T/yr	**T/yr**	**T/yr**	**T/yr**	**T/yr**	**T/yr**
Concrete Batch Plant	0.05	--	--	--	--	0.00002
Diesel Boiler	0.26	1.56	0.39	0.02	0.04	0.00010
Diesel Fired Engine	0.97	30.89	16.89	0.03	6.37	--
Transfer Points	0.19	--	--	--	--	--
Total	**1.47**	**32.45**	**17.28**	**0.05**	**6.41**	**0.00012**

A summary of the estimated controlled emissions of toxic air pollutants (TAP) is provided in the following table. The emission estimates are total summation values of each unit used at the facility which are outlined in the previous table.

Table 9 EMISSIONS ESTIMATES OF TAP AND HAP – CONTROLLED EMISSIONS

Metals	HAP	TAP	lb/hr	T/yr	Averaging Period	EL lb/hr	Exceeded?
Arsenic	X	X	1.14E-06	3.11E-06	Annual	1.50E-06	No
Barium		X	2.16E-05	4.72E-05	24-hour	3.30E-02	No
Beryllium	X	X	8.80E-08	2.71E-07	Annual	2.80E-05	No
Cadmium	X	X	2.71E-06	1.41E-06	Annual	3.70E-06	No
Cobalt	X	X	4.12E-07	9.02E-07	24-hour	3.30E-03	No
Copper		X	4.17E-06	9.13E-06	24-hour	1.30E-02	No
Chromium	X	X	1.06E-05	1.50E-05	24-hour	3.30E-02	No
Manganese	X	X	2.94E-05	1.99E-05	24-hour	3.33E-01	No
Mercury	X	X	1.27E-06	2.79E-06	24-hour	3.00E-03	No
Molybdenum		X	5.39E-06	1.18E-05	24-hour	2.70E-05	No
Nickel	X	X	6.91E-06	1.03E-05	Annual	2.70E-05	No
Phosphorus	X	X	9.65E-05	1.40E-05	24-hour	7.00E-03	No
Selenium	X	X	3.93E-07	4.56E-07	24-hour	1.30E-02	No
Vanadium		X	1.13E-05	2.47E-05	24-hour	3.00E-03	No
Zinc		X	1.42E-04	3.11E-04	24-hour	6.67E-01	No
Chromium VI	X	X	2.68E-07	1.17E-06	Annual	5.60E-07	No
Non PAH Organic Compunds							
Pentane		X	7.84E-03	1.72E-02	24-hour	118	No
Methyl Ethyl Ketone		X	0.00E+00	0.00E+00	24-hour	39.3	No
Non-PAH HAPs							
Acetaldehyde	X	X	1.18E-04	5.18E-04	Annual	3.00E-03	No
Acrolein	X	X	7.39E-05	1.62E-04	24-hour	1.70E-02	No
Benzene	X	X	3.65E-03	1.59E-02	Annual	8.00E-04	Yes
1,3 - Butadiene	X	X	0.00E+00	0.00E+00	Annual	2.40E-05	No
Ethyl Benzene	X	X	0.00E+00	0.00E+00	24-hour	29	No
Formaldehyde	X	X	5.54E-04	1.71E-03	Annual	5.10E-04	Yes
Hexane	X	X	8.82E-03	1.93E-02	24-hour	12	No
Isooctane	X		0.00E+00	0.00E+00	NA	NA	NA
Methyl Chloroform	X	X	0.00E+00	0.00E+00	24-hour	127	No
Propionaldehyde	X	X	0.00E+00	0.00E+00	24-hour	2.87E-02	No
Quinone	X	X	0.00E+00	0.00E+00	24-hour	2.70E-02	No
Toluene	X	X	2.65E-03	5.81E-03	24-hour	25	No
o-Xylene	X	X	1.81E-03	3.97E-03	24-hour	7.00E-03	No
PAH HAPs							
2-Methylnaphthalene	X	X	5.88E-08	2.94E-08	Annual	9.10E-05	No
3-Methylchloranthrene	X	X	4.41E-09	2.21E-09	Annual	2.50E-06	No
Acenaphthene	X	X	2.20E-05	9.62E-05	Annual	9.10E-05	No
Acenaphthylene	X	X	4.33E-05	1.90E-04	Annual	9.10E-05	No
Anthracene	X	X	5.78E-06	2.53E-05	Annual	9.10E-05	No
Benzo(a)anthracene	X	X	2.92E-06	1.28E-05	Annual	9.10E-05	No
Benzo(a)pyrene	X	X	1.21E-06	5.28E-06	Annual	2.00E-06	No
Benzo(b)fluoranthene	X	X	5.21E-06	2.28E-05	Annual	2.00E-06	Yes
Benzo(e)pyrene	X	X	0.00E+00	0.00E+00	Annual	2.00E-06	No
Benzo(g,h,i)perylene	X	X	2.61E-06	1.14E-05	Annual	9.10E-05	No
Benzo(k)fluoranthene	X	X	1.03E-06	4.48E-06	Annual	2.00E-06	No
Chrysene	X	X	7.18E-06	3.14E-05	Annual	2.00E-06	Yes
Dibenzo(a,h)anthracene	X	X	1.63E-06	7.11E-06	Annual	2.00E-06	No
Dichlorobenzene	X	X	2.94E-06	1.47E-06	Annual	9.10E-05	No
Fluoranthene	X	X	1.89E-05	8.28E-05	Annual	9.10E-05	No
Fluorene	X	X	6.01E-05	2.63E-04	Annual	9.10E-05	No
Indeno(1,2,3-cd)pyrene	X	X	1.95E-06	8.51E-06	Annual	2.00E-06	No
Naphthalene	X	X	1.16E-03	3.87E-03	24-hour	3.33	No
Naphthalene	X	X	1.50E-06	7.48E-07	24-hour	9.10E-05	No
Perylene	X		0.00E+00	0.00E+00	NA	NA	NA
Phenanathrene	X	X	1.91E-04	8.38E-04	Annual	9.10E-05	Yes
Pyrene	X	X	1.74E-05	7.62E-05	Annual	9.10E-05	No
Polycyclic Organic Matter (POM)	X	X	2.11E-05	1.40E-08	Annual	2.00E-06	Yes

All pollutants that exceeded their emission limit were modeled to demonstrate compliance with AAC or AACC. A detailed emissions inventory for this facility is included in Appendix A.

Initial Interstate 84 Declo Location

The emissions inventory of this portable concrete batch plant was developed by DEQ based on AP-42 Section 11.12 emission factors for a central-mix concrete batch plant and the following assumptions: 220 cy per hour concrete production capacity and concrete production limits of 72,000 cy per year. Baghouse/cartridge filter capture efficiencies were presumed to be 99.0% in DEQ's generic emissions estimation. This assumes worst case emissions associated with the concrete batch plant.

Table 10 CONTROLLED EMISSIONS ESTIMATES OF PM_{10}

Emissions Unit	Emission Factor[a]	PM_{10}	
	lb/cy	lb/hr	T/yr
Aggregate delivery to ground storage*	0.0031	0.682	0.112
Sand delivery to ground storage*	0.0007	0.154	0.025
Aggregate transfer to conveyor*	0.0031	0.682	0.112
Sand transfer to conveyor*	0.0007	0.154	0.025
Aggregate transfer to elevated storage*	0.0031	0.682	0.112
Sand transfer to elevated storage*	0.0007	0.154	0.025
Cement delivery to Silo (controlled EF because baghouse is process equipment)	0.0001	0.022	0.004
Cement supplement delivery to Silo (controlled EF because baghouse is process equipment)	0.0002	0.044	0.007
Weigh hopper loading (sand & aggregate batcher loading)	0.0038	0.836	0.137
Central mix loading, Table 11.12-2, Controlled	0.0019	0.418	0.068
Total, Point Sources		**1.320**	**0.216**
Total, Process Fugitives		**2.508**	**0.411**

As stated above, the annual throughput at the I-84 Site is 72,000 cy/day. Of that, 491 lb of cement and 73 lb of flyash or supplement are generated in each cubic yard of material. Using a simple equation of 72,000 cy/yr x 491 lb cement/cy (or 73 lb supplement/cy) / 2000 lb/T it was determined that 17,676 T/yr of cement and 2,628 T/yr of supplement is generated. In association with appropriate emission factors for HAPs/TAPs the following hourly and annual toxic emissions were determined.

Table 11 HAPs EMISSIONS ESTIMATES FROM CONCRETE BATCHING

Process	**Arsenic**			**Beryllium**			**Cadmium**		
	EF(lb/ton)[a]	**lb/hr[b]**	**T/yr[c]**	**EF(lb/ton)[a]**	**lb/hr[b]**	**T/yr[c]**	**EF(lb/ton)[a]**	**lb/hr[b]**	**T/yr[c]**
Cement Silo Filling	4.24E-09	1.04E-07	3.75E-08	4.86E-10	1.19E-08	4.30E-09	4.86E-10	1.19E-08	4.30E-09
Flyash Silo Filling	1.00E-06	3.65E-06	1.31E-06	9.04E-08	7.23E-08	1.19E-07	1.98E-08	4.86E-07	1.19E-07
Central Batching	3.87E-08	3.76E-06	1.35E-06	ND	ND	ND	7.10E-10	1.43E-07	5.14E-08
Total		**7.52E-06**	**2.71E-06**		**8.42E-08**	**1.23E-07**		**6.41E-07**	**8.17E-08**

Process	**Total Chromium**			**Hexavalent Chromium[d]**			**Lead**		
	EF(lb/ton)[a]	**lb/hr[b]**	**T/yr[c]**	**EF(lb/ton)[a]**	**lb/hr[b]**	**T/yr[c]**	**EF(lb/ton)[a]**	**lb/hr[b]**	**T/yr[c]**
Cement Silo Filling	2.09E-08	7.12E-07	2.56E-07	2.09E-08	1.42E-07	5.13E-08	1.09E-08	2.68E-07	9.63E-08
Flyash Silo Filling	1.22E-06	4.45E-06	1.60E-06	1.22E-06	1.34E-06	4.81E-07	5.20E-07	1.90E-06	6.83E-07
Central Batching	1.27E-07	2.56E-05	9.20E-06	1.27E-07	6.39E-06	2.30E-06	3.66E-08	7.36E-06	2.65E-06
Total		**3.07E-05**	**1.11E-05**		**7.87E-06**	**2.83E-06**		**9.53E-06**	**3.43E-06**

Process	**Manganese**			**Nickel**			**Phosphorus**		
	EF(lb/ton)[a]	**lb/hr[b]**	**T/yr[c]**	**EF(lb/ton)[a]**	**lb/hr[b]**	**T/yr[c]**	**EF(lb/ton)[a]**	**lb/hr[b]**	**T/yr[c]**
Cement Silo Filling	1.17E-07	2.87E-06	1.03E-06	4.18E-08	1.03E-06	3.69E-07	ND	ND	ND
Flyash Silo Filling	2.56E-07	9.34E-07	3.36E-07	2.28E-06	8.32E-06	3.00E-06	3.54E-06	1.29E-05	4.65E-06
Central Batching	3.78E-06	7.61E-04	2.74E-04	2.48E-07	4.99E-05	1.80E-05	1.20E-06	2.41E-04	8.69E-05
Total		**7.64E-04**	**2.75E-04**		**5.92E-05**	**2.13E-05**		**2.54E-04**	**9.16E-05**

Process	**Selenium**			**Total Metal HAPs**	
	EF(lb/ton)[a]	**lb/hr[b]**	**T/yr[c]**	**lb/hr[b]**	**T/yr[c]**
Cement Silo Filling	ND	ND	ND	5.01E-06	1.80E-06
Flyash Silo Filling	7.24E-08	2.64E-07	9.51E-08	3.30E-05	1.18E-05
Central Batching	ND	ND	ND	1.09E-03	3.92E-04
Total		**2.64E-07**	**9.51E-08**	**1.13E-03**	**4.06E-04**

a) All emission factors assume use of a fabric filter (baghouse) and are derived from AP-42, Section 11.12, Table 8.
b) The lb/hr calculation is the maximum 1-hr average
c) All annual calculations are assuming 720 hr/yr and 72,000 cy/day throughput
d) The percentage assumed for Cr 6+ was 20%

Initial Interstate 84 Declo Location – IC Engine Emissions

Emissions associated with 1,004 and 126 bhp engines were calculated from AP-42 emission factors in Section 3.3 and 3.4 as well as manufacturer specifications. PM_{10}, NO_x and CO emissions were based on manufacturer emission factors for both engines. Caterpillar factors were also used for VOC emissions of the 1,004 bhp engine. SO_2 emissions were calculated from AP-42 emission factors. The larger engine assumed sulfur content of 0.5% Although that high of a sulfur content is not allowed, it was valid to apply that percentage for emissions estimations as it is much more conservative than what actual fuel that will be used in the engine. VOC emissions were calculated from manufacturer specifications for the 1,004 bhp engine, but AP-42, Section 3.3, Table 1 was used for the smaller 126 bhp engine. It was assumed that TOC exhaust was equivalent to VOC emissions. Both engines were assumed to operate 800 hr/yr. All criteria pollutants emission estimates are shown in the following table.

Table 12 INTERNAL COMBUSTION ENGINE CRITERIA POLLUTANTS CONTROLLED EMISSION ESTIMATES

IC Engine	PM_{10}		NOx		SO_2		CO		VOC	
	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr
1,004 bhp Engine	0.031	0.012	12.240	4.896	4.016	1.606	0.310	0.124	10.040	4.016
126 bhp Engine	0.053	0.021	0.706	0.282	0.258	0.103	0.331	0.132	0.311	0.124
Total	**0.084**	**0.033**	**12.946**	**5.178**	**4.274**	**1.709**	**0.641**	**0.256**	**10.351**	**4.140**

All toxic pollutants associated with the two IC engines are listed below along with each emission estimates. All emissions factors used to determine the estimates are derived from AP-42, Section 3.3 and 3.4, Tables 3.3-2, 3.4-3 and 3.4-4. Each hourly emission rate is calculated using an average BSFC of 7,000 Btu/hp-hr. The annual rates assume 800 hr/yr for each engine.

Table 13 INTERNAL COMBUSTION ENGINE HAPs CONTROLLED EMISSION ESTIMATES

IC Engine	Formaldehyde		Benzene		Toluene		Xylenes	
	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr
1,004 bhp Engine	5.54E-04	2.22E-04	5.46E-03	2.18E-03	1.98E-03	7.90E-04	1.36E-03	5.42E-04
126 bhp Engine	1.04E-03	4.16E-04	8.23E-04	3.29E-04	3.61E-04	1.44E-04	2.51E-04	1.01E-04
Total	**1.60E-03**	**6.38E-04**	**6.28E-03**	**2.51E-03**	**2.34E-03**	**9.34E-04**	**1.61E-03**	**6.43E-04**
IC Engine	**Propylene[a]**		**Acetaldehyde**		**Acrolein**		**PAH[b]**	
	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr
1,004 bhp Engine	1.96E-03	7.84E-04	1.77E-04	7.08E-05	5.54E-05	2.22E-05	2.41E-05	9.64E-06
126 bhp Engine	NA	NA	6.77E-04	2.71E-04	8.16E-05	3.26E-05	3.97E-06	1.59E-06
Total	**1.96E-03**	**7.84E-04**	**8.54E-04**	**3.41E-04**	**1.37E-05**	**5.48E-05**	**2.81E-05**	**1.12E-05**
IC Engine	**POM[c]**		**1,3 Butadiene[a]**		**Naphthalene[d]**		**Total HAPs**	
	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr
1,004 bhp Engine	2.47E-05	9.90E-05	NA	NA	5.96E-04	2.38E-04	1.16E-02	4.63E-03
126 bhp Engine	3.15E-06	1.26E-06	3.45E-05	1.38E-05	1.15E-04	4.59E-05	3.28E-03	1.31E-03
Total	**2.79E-05**	**1.12E-05**	**3.45E-05**	**1.38E-05**	**7.11E-04**	**2.84E-04**	**1.49E-02**	**5.94E-03**

a. NA indicates that the pollutant in question is not emitted by that given engine.
b. PAH - Polycyclic aromatic hydrocarbons, the emission factor used to calculate the emissions is the summation of all PAH compounds.
c. POM - Polycylic Organic Matter, seven of the PAH compounds. Again, the emission factor is derived from the summation of the seven.
d. Naphthalene is added as it was calculated to determine if modeling of the pollutant was necessary.

Table 14 FACILITY WIDE EMISSIONS ESTIMATES AT THE I-84 SITE

Emissions Unit	PM_{10}[a]	NO_x	CO	SO_2	VOC	HAPs
	T/yr	T/yr	T/yr	T/yr	T/yr	T/yr
Diesel Engines	0.03	5.18	0.26	1.71	4.14	5.94E-03
Concrete Batch (Point Source)	0.35	--	--	--	--	
Concrete Batch (Fugitive)	5.21	--	--	--	--	4.06E-04
Stockpile Loading-Unloading (Fugitive)	0.96	--	--	--	--	
Total	**1.80**	**5.18**	**0.26**	**1.71**	**4.14**	**0.0063**

a. Fugitive Emissions are not included for Processing Fee Determination.

Ambient Air Quality Impact Analyses

DEQ conducted a verification modeling run. It was determined that the facility was unnecessarily putting restraints on their modeling compliance demonstration. For example, AP-42 Section 11-12 Concrete Batching emission factors are identical for controlled and uncontrolled. All Idaho DEQ permits related to concrete batching require a minimum of the use of best management practices to control dust. This equates to 75% control. Wadsworth did not account for that 75% control efficiency in their modeling demonstration. They also did not calculate 24-hr and annual average emission rates for each HAP/TAP. Rather they assumed a maximum 1-hr average. Finally, the permittee only modeled for daytime hours. To avoid restricting them to those 12-hr, DEQ conducted a 12 hour nighttime run in the verification Details of the verification modeling run is available in Appendix C.

Wadsworth also requested the ability to operate the batch plant throughout the state. While they only submitted information pertaining to the I-84 Declo site, DEQ has been developing a general concrete batch permit with associated modeling criteria. To allow for the requested portability, DEQ provided Wadsworth with a set of criteria that was agreed upon to allow for movement throughout the state. Appendix D provides a modeling discussion that corresponds to those options.

The applicant has demonstrated compliance to DEQ's satisfaction that emissions from this facility will not cause or significantly contribute to a violation of any ambient air quality standard. The applicant has also demonstrated compliance to DEQ's satisfaction that the emissions increase due to this permitting action will not exceed any acceptable ambient concentration (AAC) or acceptable ambient concentration for carcinogens (AACC) for toxic air pollutants (TAP). A summary of the Ambient Air Impact Analysis for TAP is provided in the following table.

An ambient air quality impact analyses document has been crafted by DEQ based on a review of the modeling analysis submitted in the application. That document is part of the final permit package for this permitting action.

REGULATORY ANALYSIS

Attainment Designation (40 CFR 81.313)

Because a separate modeling analysis was not provided to demonstrate compliance with applicable standards in nonattainment areas, this portable facility is not permitted for operation in nonattainment areas.

Permit to Construct (IDAPA 58.01.01.201)

The proposed project does not meet the permit to construct exemption criteria in IDAPA 58.01.01.220–223.

A concrete batch plant with associated internal combustion engine and boiler are not categorically exempt and therefore do not meet the criteria of IDAPA 58.01.01.221 or 222. As a result, a permit to construct is required in accordance with IDAPA 58.01.01.201. This permitting action was processed in accordance with the procedures of IDAPA 58.01.01.200-228.

Tier II Operating Permit (IDAPA 58.01.01.401)

The application was submitted for a permit to construct (refer to the Permit to Construct section), and an optional Tier II operating permit has not been requested. Therefore, the procedures of IDAPA 58.01.01.400–410 were not applicable to this permitting action.

Title V Classification (IDAPA 58.01.01.300, 40 CFR Part 70)

The facility is not classified as a major facility as defined in IDAPA 58.01.01.008.10. The facility is a natural minor facility, because without limits on the potential to emit, the emissions of regulated air pollutants are below major source thresholds. Therefore, the requirements of IDAPA 58.01.01.300–399 are not applicable to this permitting action.

PSD Classification (40 CFR 52.21)

The facility is not a major stationary source as defined in 40 CFR 52.21(b)(1), nor is it undergoing any physical change at a stationary source not otherwise qualifying under paragraph 40 CFR 52.21(b)(1) as a major stationary source, that would constitute a major stationary source by itself as defined in 40 CFR 52. Therefore in accordance with 40 CFR 52.21(a)(2), PSD requirements are not applicable to this permitting action. The facility is not a designated facility as defined in 40 CFR 52.21(b)(1)(i)(a), and does not have facility-wide emissions of any criteria pollutant that exceed 250 T/yr.

NSPS Applicability (40 CFR 60)

The facility is subject to the requirements of 40 CFR 60 Subpart IIII – Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units, and 40 CFR 60 Subpart IIII – Standards of Performance for Stationary Compression Ignition Internal Combustion Engines.

40 CFR 60, Subpart IIII .... Standards of Performance for Stationary Compression Ignition Internal Combustion Engines

§ 60.4200 Am I subject to this subpart?

(a) The provisions of this subpart are applicable to manufacturers, owners, and operators of stationary compression ignition (CI) internal combustion engines (ICE) as specified in paragraphs (a)(1) through (3) of this section. For the purposes of this subpart, the date that construction commences is the date the engine is ordered by the owner or operator.

(1) Manufacturers of stationary CI ICE with a displacement of less than 30 liters per cylinder where the model year is:

(i) 2007 or later, for engines that are not fire pump engines,

(ii) The model year listed in table 3 to this subpart or later model year, for fire pump engines.

(2) Owners and operators of stationary CI ICE that commence construction after July 11, 2005 where the stationary CI ICE are:

(i) Manufactured after April 1, 2006 and are not fire pump engines, or

(ii) Manufactured as a certified National Fire Protection Association (NFPA) fire pump engine after July 1, 2006.

(3) Owners and operators of stationary CI ICE that modify or reconstruct their stationary CI ICE after July 11, 2005.

Wadsworth – Only the 1,004 bhp IC Engine is subject to this subpart as it was constructed in 2006 after July 1. The 126 bhp IC Engine is also subject because it was constructed in 2008 according to manufacturer specifications.

§ 60.4201 What emission standards must I meet for non-emergency engines if I am a stationary CI internal combustion engine manufacturer?

Wadsworth – Ralph L. Wadsworth Construction is not the manufacturer of the IC engine and therefore this requirement is not applicable.

§ 60.4202 What emission standards must I meet for emergency engines if I am a stationary CI internal combustion engine manufacturer?

Wadsworth – Ralph L. Wadsworth Construction is not the manufacturer of the IC engine and the engine is not used for emergency purposes. Therefore, this requirement is not applicable.

§ 60.4203 How long must my engines meet the emission standards if I am a stationary CI internal combustion engine manufacturer?

Wadsworth – Ralph L. Wadsworth Construction is not the manufacturer of the IC engine and therefore this requirement is not applicable.

§ 60.4204 What emission standards must I meet for non-emergency engines if I am an owner or operator of a stationary CI internal combustion engine?

a) Owners and operators of pre-2007 model year non-emergency stationary CI ICE with a displacement of less than 10 liters per cylinder must comply with the emission standards in table 1 to this subpart. Owners and operators of pre-2007 model year non-emergency stationary CI ICE with a displacement of greater than or equal to 10 liters per cylinder and less than 30 liters per cylinder must comply with the emission standards in 40 CFR 94.8(a)(1).

(b) Owners and operators of 2007 model year and later non-emergency stationary CI ICE with a displacement of less than 30 liters per cylinder must comply with the emission standards for new CI engines in §60.4201 for their 2007 model year and later stationary CI ICE, as applicable.

Wadsworth – Ralph L. Wadsworth Construction must certify that their 126 bhp IC engine meets all non-road engine standards: 40 CFR 89.112, 40 CFR 89.113, 40 CFR 1039.101, 40 CFR 1039.102, 40 CFR 1039.104, 40 CFR 1039.105, 40 CFR 1039.107, and 40 CFR 1039.115, as applicable. These emission standard requirements are accounted for in the PTC.

Also, the 1,004 bhp IC engine must comply with standards set forth in Table 1 of the subpart. Those standards are all in units of g/hp-hr and are as follows: 1.0 HC (VOC), 6.9 NOx, 8.5 CO and 0.54 PM. Each of the pollutants emission rates from the manufacturer specifications meet or is below those standards and is accounted for in the PTC.

§ 60.4205 What emission standards must I meet for emergency engines if I am an owner or operator of a stationary CI internal combustion engine?

Wadsworth – Ralph L. Wadsworth Construction is not using the IC engines for emergency purposes. Therefore, this requirement is not applicable.

§ 60.4206 How long must I meet the emission standards if I am an owner or operator of a stationary CI internal combustion engine?

Owners and operators of stationary CI ICE must operate and maintain stationary CI ICE that achieve the emission standards as required in §§60.4204 and 60.4205 according to the manufacturer's written instructions or procedures developed by the owner or operator that are approved by the engine manufacturer, over the entire life of the engine.

Wadsworth – Ralph L. Wadsworth Construction must operate the IC engines for the life of the unit in accordance with manufacturer-approved methods. This is included in the PTC.

§ 60.4207 What fuel requirements must I meet if I am an owner or operator of a stationary CI internal combustion engine subject to this subpart?

(a) Beginning October 1, 2007, owners and operators of stationary CI ICE subject to this subpart that use diesel fuel must use diesel fuel that meets the requirements of 40 CFR 80.510(a).

(b) Beginning October 1, 2010, owners and operators of stationary CI ICE subject to this subpart with a displacement of less than 30 liters per cylinder that use diesel fuel must use diesel fuel that meets the requirements of 40 CFR 80.510(b) for nonroad diesel fuel.

Wadsworth – Ralph L. Wadsworth Construction has stated that they will operate the applicable IC engine in accordance with 40 CFR 80.510(b). The fuel sulfur content cannot exceed 15 ppm or 0.0015% by weight after October 1, 2010 throughout the state. They may use 0.5% at the I-84 site up to October 1, 2010, but any other site must exclusively use 0.0015% sulfur beginning immediately.

§ 60.4208 What is the deadline for importing or installing stationary CI ICE produced in the previous model year?

(b) After December 31, 2009, owners and operators may not install stationary CI ICE with a maximum engine power of less than 19 KW (25 HP) (excluding fire pump engines) that do not meet the applicable requirements for 2008 model year engines.

Wadsworth – Ralph L. Wadsworth Construction is installing a 2008 model engine that meets the applicable requirements for that model year. The 2006 engine also meets all applicable requirements.

§ 60.4209 What are the monitoring requirements if I am an owner or operator of a stationary CI internal combustion engine?

Wadsworth – Ralph L. Wadsworth Construction is not installing an emergency IC engine. Thus, a non-resettable meter is not required and the engine does not have a diesel particulate filter. These requirements are not applicable to the unit, but the unit must comply with 60.4211.

§ 60.4210 What are my compliance requirements if I am a stationary CI internal combustion engine manufacturer?

Wadsworth – Ralph L. Wadsworth Construction is not the manufacturer of the IC engine and therefore this requirement is not applicable.

§ 60.4211 What are my compliance requirements if I am an owner or operator of a stationary CI internal combustion engine?

(a) If you are an owner or operator and must comply with the emission standards specified in this subpart, you must operate and maintain the stationary CI internal combustion engine and control device according to the manufacturer's written instructions or procedures developed by the owner or operator that are approved by the engine manufacturer. In addition, owners and operators may only change those settings that are permitted by the manufacturer. You must also meet the requirements of 40 CFR parts 89, 94 and/or 1068, as they apply to you

(b) If you are an owner or operator of a pre-2007 model year stationary CI internal combustion engine and must comply with the emission standards specified in §§60.4204(a) or 60.4205(a), or if you are an owner or operator of a CI fire pump engine that is manufactured prior to the model years in table 3 to this subpart and must comply with the emission standards specified in §60.4205(c), you must demonstrate compliance according to one of the methods specified in paragraphs (b)(1) through (5) of this section

(c) If you are an owner or operator of a 2007 model year and later stationary CI internal combustion engine and must comply with the emission standards specified in §60.4204(b) or §60.4205(b), or if you are an owner or operator of a CI fire pump engine that is manufactured during or after the model year that applies to your fire pump engine power rating in table 3 to this subpart and must comply with the emission standards specified in §60.4205(c), you must comply by purchasing an engine certified to the emission standards in §60.4204(b), or §60.4205(b) or (c), as applicable, for the same model year and maximum (or in the case of fire pumps, NFPA nameplate) engine power. The engine must be installed and configured according to the manufacturer's specifications.

Wadsworth – Ralph L. Wadsworth Construction is subject to 60.4204 (a) and (b), therefore the engine must be installed and configured according to the manufacturer's specifications. This requirement is included in the PTC.

§ 60.4212 What test methods and other procedures must I use if I am an owner or operator of a stationary CI internal combustion engine with a displacement of less than 30 liters per cylinder?

Wadsworth – A Performance test on the IC engines are not required and therefore this requirement is not applicable to Ralph L. Wadsworth Construction and the 126 bhp and 1,004 bhp IC engines.

§ 60.4213 What test methods and other procedures must I use if I am an owner or operator of a stationary CI internal combustion engine with a displacement of greater than or equal to 30 liters per cylinder?

Wadsworth – A Performance test on the IC engines is not required and the engines are less than 30 liters per cylinder. Therefore this requirement is not applicable to Ralph L. Wadsworth Construction and the 126 bhp and 1,004 bhp IC engines.

§ 60.4214 What are my notification, reporting, and recordkeeping requirements if I am an owner or operator of a stationary CI internal combustion engine?

Wadsworth – The applicable IC engines do not meet the criteria set forth in the subpart requiring notification. Therefore this requirement is not applicable.

§ 60.4215 What requirements must I meet for engines used in Guam, American Samoa, or the Commonwealth of the Northern Mariana Islands?

Wadsworth – The applicable IC engines are not being operated in Guam, American Somoa or the Northern Mariana Islands. Therefore this requirement is not applicable.

§ 60.4216 What requirements must I meet for engines used in Alaska?

Wadsworth – The applicable IC engines are not being operated in Alaska. Therefore this requirement is not applicable.

§ 60.4217 What emission standards must I meet if I am an owner or operator of a stationary internal combustion engine using special fuels?

Wadsworth – The applicable IC engines are not using any special fuels. Therefore this requirement is not applicable.

Also, because, Wadsworth requested portability and did not demonstrate compliance on their own, they must abide by DEQ General concrete batch requirements. They are as follows:

While not all engines are subject to IIII based on their manufacture and reconstruction dates it was a decision made by the Idaho DEQ that all CBP that operate an engine must comply with Subpart IIII in order to use the general permit. The rationale is as follows:

As the general permit was being constructed there were discussions about the differences between 40 CFR 60, subpart IIII and Non-road Diesel Engine requirements, 40 CFR 1068.30. According to CFR 1068.30, Non-road engine means that, by itself or in or on a piece of equipment, is portable or transportable, meaning designed to be and capable of being carried or moved from one location to another. Indicia of transportability include, but are not limited to, wheels, skids, carrying handles, dolly, trailer, or platform.

Also, according to 40 CFR 1068.30 (2)(iii), an internal combustion engine is not a non-road engine if it:

- Will remain at a location for more than 12 consecutive months or a shorter period of time for an engine located at a seasonal source.
- A location is any single site at a building, structure, facility, or installation.
- Any engine (or engines) that replace an engine at a location and that is intended to perform the same or similar function as the engine replaced will be included in calculating the consecutive time period.

The conclusions were that the requirements for non-road engines and subpart IIII were very similar with a few exceptions. Those exceptions being the installation of a non-resettable hour meter, the maintenance schedule and the use of colored fuel. But possibly, the biggest issue was the timeframe that stipulated whether or not a unit was stationary or non-road. If an engine stays in one place longer than 12 months it is considered a stationary source and would be subject to subpart IIII. In order to avoid any potential non-compliance issues and to eliminate the possibility of failure by a non-road engine it was concluded to require subpart IIII for all units regardless of time at a given location. For simplicity, all applicants that choose the general permit must comply with subpart IIII.

NESHAP Applicability (40 CFR 61)

The facility is not subject to any NESHAP requirements in 40 CFR 61.

MACT Applicability (40 CFR 63)

The facility is not subject to any MACT standards in 40 CFR Part 63.

CAM Applicability (40 CFR 64)

The facility is not classified as a major source (refer to Title V Classification section). Because the facility does not require a Title V permit, the requirements of CAM are not applicable.

Permit Conditions Review

This section describes the permit conditions for this initial permit.

Scope

Purpose

Permit Condition 1.

States that the purpose is to permit a concrete batch plant

Permit Condition 2.

The table in this condition outlines those regulated sources within the permit.

Facility wide Conditions

Fuel Specifications

Permit Condition 3.

This condition identifies the allowable fuels that may be combusted in the boiler. The restriction of sulfur content is to maintain consistency between the boiler and engine as there is a restriction of sulfur content in accordance with 40 CFR 60.4207 and 40 CFR 80.510(b). Although the 15 ppm standard for 40 CFR 60, subpart IIII does not go into effect until June 1, 2010, it was the state of Idaho's choice to implement the standard immediately for use of this general CBP permit.

Permit Condition 4.

This condition identifies the allowable fuels that may be combusted in the internal combustion engines. There is a restriction of sulfur content in accordance with 40 CFR 60.4207 and 40 CFR 80.510(b). Although the 15 ppm standard for 40 CFR 60, subpart IIII does not go into effect until June 1, 2010, it was the state of Idaho's choice to implement the standard immediately for use of this general CBP permit.

Permit Condition 5.

Specifics as to the fuel requirements for 40 CFR 60, subpart IIII are identified in 40 CFR 80.510(b). The cetane and dye requirements also are being implemented prior to June 1, 2010 per DEQ decision for the general permit.

Fuel Monitoring and Recordkeeping

Permit Condition 6.

The permittee needs to maintain documentation of supplier diesel sulfur content each time fuel is received to demonstrate compliance with the fuel sulfur content condition for the boiler.

Fugitive Dust Control

Permit Condition 7.

Reasonable control requirements for fugitive dust are needed at any potential site. It states that the plant may not operate unless an efficient fugitive dust control system is in place.

Permit Condition 8.

More fugitive dust control is required by implemented Best Management Practices. Visible emissions are determined by a see/no see basis at the facility boundary. If visible emissions are present, the permittee must take appropriate action to correct the problem or perform a Method 22 test. If 95 % control is assumed three other requirements are included to further suppress any potential dust emissions. These include management of roadways, three-side barriers and covering of aggregate/sand piles.

Fugitive Dust Control Monitoring & Recordkeeping

Permit Condition 9.

Requires the permittee to conduct inspections each day that the plant is operating to assess the control of fugitive emissions and specifies actions to take as a result of such inspections.

Odors

Permit Condition 10.

The permittee must operate in accordance with IDAPA 58.01.01.776.01 to minimize odor problems associated with the facility.

Permit Condition 11.

Maintaining records of odor complaints, and corrective action taken, will demonstrate compliance with this condition.

PM_{10} Nonattainment Areas

Permit Condition 12.

The concrete batch plant cannot operate in a $PM_{2.5}$ or PM_{10} nonattainment area. This was determined through modeling analysis. See the associated modeling memo.

Collocation

Permit Condition 13.

The concrete batch plant may only collocate with one permitted rock crushing facility which is under direct control of the permittee and not within 200 meters or 656 feet. They also cannot operate concurrently.

Reporting Requirements

Permit Condition 14.

When relocating to another site, the permittee must submit a PERF form within 10 days of desired moving date in accordance with IDAPA 58.01.01.500.

Subpart A General Provisions

Permit Condition 15.

This set of general provisions applies because the HMA plant is an affected facility in accordance with 40 CFR 60, Subpart IIII Standards of Performance for Stationary Compression Ignition Internal Combustion Engines.

Incorporation by Reference

Permit Condition 16.

If there is any discrepancy between this permit and the NSPS standard this condition states that the federal standards shall govern.

Concrete Batch Plant

Description

Permit Condition 17.

The process description is provided to outline the activity at the facility.

Permit Condition 18.

The table in this condition outlines the associated emission control devices for each regulated unit.

Emissions Limits

Permit Condition 19.

The condition is in accordance with the opacity limit of 20% as stated by IDAPA 58.01.01.625.

Permit Condition 20.

The emissions limit requirement for a diesel fired boiler states that the permittee must comply with IDAPA 58.01.01.677. The permittee shall not discharge PM to the atmosphere from any fuel-burning equipment source in excess of 0.050 gr/dscf of effluent gas corrected to 3% oxygen by volume for liquid.

Operating Requirements

Permit Condition 21.

At the initial Interstate 84 site, the facility requested an hourly and annual limit stated in the condition. The hourly was converted into a daily limit in an effort to allow the facility a bit more flexibility. DEQ conducted a verification modeling run. In that run it was assumed that the hourly production rate was 280 cy/hr, not 220 cy/hr as requested by the permittee. The permittee also requested an operational limit of 12 hr/day. Rather than restrict them to only 12 hr/day it was concluded that 3,360 or 280 x 12 would allow the facility to work the hours desired on a given day. It is also to be consistent with providing a throughput limit in many other permits rather operational limit Also these production rates were used to demonstrate compliance with NAAQS standards.

Permit Condition 22.

Limits to production and required setback are determined for any future sites. A setback distance from the property boundary was used in the ambient air quality impact analysis to demonstrate compliance with NAAQS and TAP standards. Because the equipment is portable and the location may be changed from its initial location, compliance with a minimum equipment setback distance limit is required. The setback distances are based on a number of criteria which include the use of an engine, control devices such as baghouses, boot enclosures, water ring and other suppressants. The use of a boiler at 4,380 hours per year is also included in the determination.

Permit Condition 23.

While the facility did not request the use of a boiler for the I-84 site, it will be allowed for any future locations throughout the state. This allowance is in accordance with the general concrete batch permit. General restrictions were applied to the boiler when in use. The associated boiler requires an annual fuel usage limit to demonstrate compliance with the NAAQS standards. The limit in this condition is based on a 5 MMBtu/hr maximum boiler and running 4,380 hr/yr. AP-42 Section 1.3 (9/98) assumes 140 MMBtu/10^3 gal which equates to $3.57e^{-02}/10^3$ gal/hr for a 5 MMBtu/hr boiler. That hourly rate is multiplied by 4,380 hr/yr to 156,430 gal fuel per year.

Permit Condition 24.

A Boiler is not allowed at the initial Declo site because it was not requested and was included in the modeling compliance demonstration.

Permit Condition 25.

A baghouse filter/cartridge system must be installed and all control equipment must be operated with a developed procedures document. This is required to control particulate emissions and demonstrate compliance with NAAQS standards.

Permit Condition 26.

Within 60 days of start up, the permittee needs to develop a procedures document outlining operations and maintenance schedules. This procedure must be submitted to the appropriate regional DEQ office for approval. This is to demonstrate that all required control equipment is being operated and maintained properly.

Monitoring & Recordkeeping Requirements

Permit Condition 27.

Visible emissions and/or opacity monitoring is required on a monthly basis. This includes a see/no see evaluation of baghouse stacks. If there are any visible emissions corrective actions must be taken within 24 hours. If the problem persists, a Method 9 opacity test shall be performed in accordance to IDAPA 58.01.01.130-136. Records of all inspections need to be maintained as well.

Permit Condition 28.

Concrete production monitoring is required daily, monthly and annually. This is necessary to demonstrate compliance with the production limits. Hourly monitoring production is necessary at the I-84 site because one of the throughput limits requested by the facility was 220 cy/hr.

Permit Condition 29.

Setback monitoring is required to demonstrate compliance with the setback distance requirements. This must be done each time the CBP relocates or anytime the layout has changed.

Permit Condition 30.

Each month the boiler's fuel usage need to be recorded and summed every 12 months to demonstrate compliance with the annual hourly limit.

Compression Ignition Internal Combustion Engines

Emission Description

Permit Condition 31.

Describes the two engines used by the permittee.

Emission Limits

Permit Condition 32.

Limits in this condition are equivalent to those submitted by Wadsworth. They used two sources of emission factors, AP-42 and manufacturer's specifications. The limits are based brake horsepower of each engine (1,004 bhp and 126 bhp) and each operating 800 hr/yr. While the sulfur content is assumed to be 0.5%, the permittee is not allowed anything greater than 0.05% and 0.0015% after October 1st, 2010. While some of these limits are low, most are based on manufacturer's specifications and in accordance with Subpart IIII the engine must be operating in accordance with manufacturer recommendations.

Permit Condition 33.

40 CFR 60.4204 outlines the smoke (opacity) standards that all engines must meet during each operating mode.

Operating Requirements

Permit Condition 34.

The operational hours limit is applied to demonstrate compliance with NAAQS and was requested by the permittee only at the initial I-84 site.

Permit Condition 35.

The operational hour limit of 4,380 hr/yr for all combined engines is a requirement for all future locations. This is in accordance with the criteria set forth by the Idaho DEQ for all general concrete batch plant operations. This condition was added to verify that all emission associated with the engines are less than or equal to those of a Tier II certified, 1,340 bhp engine.

Permit Condition 36.

The permittee needs to operate and maintain the diesel engine according to manufacturer procedures. This is required in accordance with 40 CFR 60, Subpart IIII specifically section 60.4211.

Permit Condition 37.

To demonstrate that the ICE is in compliance with all standards it must be meet all the requirements of 40 CFR 60.4210 for engines with a model year older than 2007. Newer models must comply with certification specifications.

Monitoring & Recordkeeping

Permit Condition 38.

Each month the permittee must record the operational time of the engine. The annual usage needs to be summed over a consecutive 12 month period to demonstrate compliance with the annual hourly limit.

Permit Condition 39.

40 CFR 60, Subpart IIII has a number of recordkeeping requirements. These include notifications, maintenance of engines, certification documentation if applicable or documentation demonstrating compliance with the emission standards if the engine is not certified.

PUBLIC REVIEW

Public Comment Opportunity

An opportunity for public comment period on the application was provided in accordance with IDAPA 58.01.01.209.01.c. During this time, there were no comments on the application and there was not a request for a public comment period on DEQ's proposed action. Refer to the chronology for public comment opportunity dates.

APPENDIX A – EMISSIONS INVENTORIES

EMISSIONS SUMMARY

Source	Fugitive or Non-Fugitive	Controlled Emissions Summary															
		PM		PM_{10}		$PM_{2.5}$		NO_X		SO_2		CO		VOC		HAPs Metals	
		lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY
Diesel Generators	Non-Fugitive	0.08	0.03	0.08	0.03			12.95	5.18	4.27	1.71	0.64	0.26	10.35	4.14	1.49E-02	5.94E-03
Concrete Batching	Non-Fugitive	2.15	0.35	1.31	0.21												
Concrete Batching	Fugitive	5.21	0.85	2.51	0.41											1.13E-03	4.06E-04
Stockpile Loading-Unloading	Fugitive	0.96	0.56	0.46	0.27	0.14	0.08										
TOTALS		**8.41**	**1.80**	**4.36**	**0.93**	**0.14**	**0.08**	**12.95**	**5.18**	**4.27**	**1.71**	**0.64**	**0.26**	**10.35**	**4.14**	**0.02**	**0.0063**

CONCRETE BATCH PLANT

Process	Fugitive or Non-Fugitive	Throughput		Emission Factors (lb/yd³)		PM_{10} Emissions		TSP Emissions		E-Factor Reference
		yd³/hr[1]	yd³/yr	PM_{10}	TSP	lb/hr	tpy	lb/hr	tpy	
Aggregate Delivery to Ground Storage - Controlled	Fugitive	220	72,000	0.0031	0.0064	0.68	0.11	1.41	0.23	AP-42, 5th Edition, Table 11.12-6
Sand Delivery to Ground Storage - Controlled	Fugitive	220	72,000	0.0007	0.0015	0.15	0.03	0.33	0.05	AP-42, 5th Edition, Table 11.12-6
Aggregate Transfer to Conveyor - Controlled	Fugitive	220	72,000	0.0031	0.0064	0.68	0.11	1.41	0.23	AP-42, 5th Edition, Table 11.12-6
Sand Transfer to Conveyor - Controlled	Fugitive	220	72,000	0.0007	0.0015	0.15	0.03	0.33	0.05	AP-42, 5th Edition, Table 11.12-6
Aggregate Transfer to Elevated Storage - Controlled	Fugitive	220	72,000	0.0031	0.0064	0.68	0.11	1.41	0.23	AP-42, 5th Edition, Table 11.12-6
Sand Transfer to Elevated Storage - Controlled	Fugitive	220	72,000	0.0007	0.0015	0.15	0.03	0.33	0.05	AP-42, 5th Edition, Table 11.12-6
Cement Delivery to Silo - Controlled	Non-Fugitive	220	72,000	0.0001	0.0002	0.02	0.00	0.04	0.01	AP-42, 5th Edition, Table 11.12-6
Cement Supplement (flyash) Delivery to Silo - Controlled	Non-Fugitive	220	72,000	0.0002	0.0003	0.04	0.01	0.07	0.01	AP-42, 5th Edition, Table 11.12-6
Weigh hopper loading - Controlled	Non-Fugitive	220	72,000	0.0038	0.0079	0.84	0.14	1.74	0.28	AP-42, 5th Edition, Table 11.12-6
Central mix loading - Controlled	Non-Fugitive	220	72,000	0.0019	0.0014	0.41	0.07	0.30	0.05	AP-42, 5th Edition, Equation 11.12-2
Total	Fugitive					2.51	0.41	5.21	0.85	
Total	Non-Fugitive					1.31	0.21	2.15	0.35	

1 yd³ of ready-mix = 4024 lbs
1 yd³ of ready-mix has 1865 lbs of course aggregate
1 yd³ of ready-mix has 1428 lbs of fine aggregate

Tons of Product		
	Fines	Course
144,864	51408.00	67140.00

[1] - This is the rated capacity of the equipment not the actual usage rate

METAL EMISSIONS

Material	Central Mix	Cement	Fly Ash	Hour/year
Throughput	144,864	17,676	2,628	720

Process	Emission Factors (lb/ton of material)								
	As	Be	Cd	Ch	Pb	Mn	Ni	P	Se
Cement Silo Filling w/Fabirc Filter	4.24E-09	4.86E-10	4.86E-10	2.90E-08	1.09E-08	1.17E-07	4.18E-08	ND	ND
Fly Ash Silo Filling w/Fabric Filter	1.00E-06	9.04E-08	1.98E-08	1.22E-06	5.20E-07	2.56E-07	2.28E-06	3.54E-06	7.24E-08
Central Mix Batching w/Fabric Filter	1.87E-08	ND	7.10E-10	1.27E-07	3.66E-08	3.78E-06	2.48E-07	1.20E-06	ND

Process	As		Be		Cd		Total CR		Non Hex CR		Hexavalent Cr		Pb	
	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY
Cement Silo Filling w/Fabirc Filter	1.04E-07	3.75E-08	1.19E-08	4.30E-09	1.19E-08	4.30E-09	7.12E-07	2.56E-07	5.70E-07	2.05E-07	1.42E-07	5.13E-08	2.68E-07	9.63E-08
Fly Ash Silo Filling w/Fabric Filter	3.65E-06	1.31E-06	7.23E-08	1.19E-07	4.86E-07	2.60E-08	4.45E-06	1.60E-06	3.12E-06	1.12E-06	1.34E-06	4.81E-07	1.90E-06	6.83E-07
Central Mix Batching w/Fabric Filter	3.76E-06	1.35E-06	ND	ND	1.43E-07	5.14E-08	2.56E-05	9.20E-06	1.92E-05	6.90E-06	6.39E-06	2.30E-06	7.36E-06	2.65E-06
Total Emissions	7.52E-06	2.71E-06	8.42E-08	1.23E-07	6.41E-07	8.17E-08	3.07E-05	1.11E-05	2.29E-05	8.23E-06	7.87E-06	2.83E-06	9.53E-06	3.43E-06

Process	Mn		Ni		P		Se		Total HAP Metals	
	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY
Cement Silo Filling w/Fabirc Filter	2.87235E-06	1.03405E-06	1.02619E-06	3.69428E-07	ND	ND	ND	ND	5.00604E-06	1.80217E-06
Fly Ash Silo Filling w/Fabric Filter	9.344E-07	3.36384E-07	0.000008322	2.99592E-06	0.000012921	4.65156E-06	2.6426E-07	9.51336E-08	3.3001E-05	1.18242E-05
Central Mix Batching w/Fabric Filter	0.000760536	0.000273793	4.98976E-05	1.79631E-05	0.00024144	8.69184E-05	ND	ND	0.001088695	0.00039193
Total Emissions	0.000764343	0.000275163	5.92458E-05	2.13285E-05	0.000254361	9.157E-05	2.6426E-07	9.51336E-08	0.001126702	0.000405557

ND = No Data
4024 lb Readymix = 1yd^3 of Readymix ; 73lbs of which is Fly Ash ; 491lbs of which is Cement
[2]AP-42, Fifth Edition, Table 11.12-6

FRONT END LOADING/STOCKPILE DISTURBANCE EMISSIONS

Drop Point Emissions	Emissions		
Pollutant	Gram/sec	Lbs/hr	Tons/yr
Total Particulate	0.12	0.96	0.56
PM10	0.06	0.46	0.27
PM2.5	0.02	0.14	0.08

Throughput Rates		
Hourly[a]	202.86	tons
Annual	118,548	tons

AP-42 Fifth Edition Jan 95
Section 13 Miscellaneous Sources
13.2 Fugitive Dust Sources
13.2.4 Aggregate Handling and Storage Piles

TSP=(k)*(0.0032)*((U/5)^1.3)/((M/2)^1.4)	13.2.4-3 Equation (1)
PM10=(k')*(0.0032)*((U/5)^1.3)/((M/2)^1.4)	13.2.4-3 Equation (1)
PM2.5=(k^2)*(0.0032)*((U/5)^1.3)/((M/2)^1.4)	13.2.4-3 Equation (1)

Where

k=	Particle size multiplier for TSP	0.74	Page 13.2.4-3
k'=	Particle size multiplier for PM10	0.35	Page 13.2.4-3
$k^{2=}$	Particle size multiplier for PM2.5	0.11	Page 13.2.4-3
U=	Mean wind speed	9	DAQ Default
M=	Material moisture content	2.1	Natural moisture
n=	Number of drop points	2	Front End Loader, Dozer to Batch Plant
TSP=	0.004749 lbs/ton		
PM10=	0.002246 lbs/ton		
PM2.5=	0.000706 lbs/ton		

[1] - calculated using the rated hourly cubic yards and the average in pounds of the fine and course material.

DIESEL GENERATOR EMISSIONS

Generator Set	hp	Hours of Operation	Emission Factors (g/hp-hr)(lb/hr)					Emissions											
								PM_{10}		NO_x		SO_2		CO		VOC		Total HAPs	
			PM_{10}[3]	NO_x[3]	SO_2[2]	CO[3]	VOC[2]	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY
Generator Set	1,004	800	1.400E-02	5.530E+00	4.000E-03	1.400E-01	1.000E-02	0.031	0.012	12.240	4.896	4.016	1.606	0.310	0.124	10.040	4.016	0.012	0.005
Generator Set	126	800	1.900E-01	2.540E+00	2.050E-03	1.190E+00	2.470E-03	0.053	0.021	0.706	0.282	0.258	0.103	0.331	0.132	0.311	0.124	0.003	0.001
TOTAL	1,130							0.084	0.034	12.946	5.178	4.274	1.710	0.640	0.256	10.351	4.140	0.015	0.006

Notes:

2 EPA AP-42 Tables 3.3-1 3.4-1 diesel industrial engine emission factors for engines less than and greater than 600 hp

3 EPA Tier 3 and manufacturer's emission factors for nonroad diesel engines

HAPS

Generator Set	hp	Hours of Operation	Emission Factors lb/MMBtu[1]									
			HCHO	Benzene	Toluene	Xylenes	Propylene	Acetald.	Acrolein	PAH	POM	1,3 Butadiene
Generator Set	1,004	800	7.890E-05	7.760E-04	2.810E-04	1.930E-04	2.790E-04	2.520E-05	7.880E-06	3.430E-06	3.520E-06	
Generator Set	126	800	1.180E-03	9.330E-04	4.090E-04	2.850E-04	0.000E+00	7.670E-04	9.250E-05	4.500E-06	3.570E-06	3.910E-05
TOTAL	1,130											

1 AP-42, 5th Edition, Tables 3.3-1,2

Generator Set	hp	Hours of Operation	Emissions																	
			HCHO		Benzene		Toluene		Xylenes		Propylene		Acetald.		Acrolein		PAH		POM	
			lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY
Generator Set	1,004	800	5.545E-04	2.218E-04	5.454E-03	2.181E-03	1.975E-03	7.899E-04	1.356E-03	5.426E-04	1.961E-03	7.843E-04	1.771E-04	7.084E-05	5.538E-05	2.215E-05	2.411E-05	9.642E-06	2.474E-05	9.895E-06
Generator Set	126	800	1.041E-03	4.163E-04	8.229E-04	3.292E-04	3.607E-04	1.443E-04	2.514E-04	1.005E-04	0.000E+00	0.000E+00	6.765E-04	2.706E-04	8.159E-05	3.263E-05	3.969E-06	1.588E-06	3.149E-06	1.259E-06
TOTAL	1,130		1.595E-03	6.381E-04	6.277E-03	2.511E-03	2.336E-03	9.342E-04	1.608E-03	6.431E-04	1.961E-03	7.843E-04	8.536E-04	3.414E-04	1.370E-04	5.479E-05	2.808E-05	1.123E-05	2.789E-05	1.115E-05

1,3 Butadiene		Total	
lb/hr	TPY	lb/hr	TPY
0.000E+00	0.000E+00	1.158E-02	4.633E-03
3.449E-05	1.379E-05	3.275E-03	1.310E-03
3.449E-05	1.379E-05	1.486E-02	5.943E-03

MODELING REQUIREMENT CHECK

Criteria Modeling Check	PB		PM_{10}		NO_X		SO_2		CO	
	lb/month	TPY	lb/yr	TPY	lb/hr	TPY	lb/yr	TPY	lb/hr	TPY
Controlled Emission Rates (tons per year)		0.00	4.36	0.93		5.18	4.27	1.71	0.64	
Modeling Threshold (tons per year)[1]	100	0.60	0.20	1.00		1.00	0.20	1.00	14.00	
Modeling Required:	NO	NO	YES	NO	NO	YES	YES	YES	NO	NO

HAP Modeling Check	Arsenic	Beryllium	Cadmium	Chromium VI	Manganese	Nickel	Phosphorus	Selenium	Formald.	Benzene	Toluene	Xylenes	Propylene	Acetald	Acrolein	1,3 Budat	POM	PAH
EL - Modeling Threshold (lb/hr)	1.50E-06	2.80E-05	3.70E-06	5.60E-07	3.33E-01	2.70E-05	7.00E-03	1.30E-02	5.100E-04	8.000E-04	2.500E+01	2.900E+01	3.200E+00	3.000E-03	1.700E-02	2.400E-05	2.000E-06	9.100E-05
Controlled Hourly Emission Rate (lb/hr)[4]	7.517E-06	8.420E-08	6.409E-07	3.072E-05	7.643E-04	5.925E-05	2.544E-04	2.643E-07	1.595E-03	6.277E-03	2.336E-03	1.608E-03	1.961E-03	8.536E-04	1.370E-04	3.449E-05	2.789E-05	2.808E-05
Modeling Required:	YES	NO	NO	YES	NO	YES	NO	NO	YES	YES	NO	NO	NO	NO	NO	YES	YES	NO

	Naphthalene
EL - Modeling Threshold (lb/hr)	9.100E-05
Controlled Hourly Emission Rate (lb/hr)[4]	7.106E-04
Modeling Required:	YES

CRITERIA POLLUTANT EMISSION INVENTORY for Portable Concrete Batch Plant

Facility Information 3/17/10 16:52

Company:	Ralph L. Wadsworth Construction	**Assumptions Implied or Stated in Application:**
Facility ID:	777-00482	
Permit No.:	P-2010.0024	See control assumptions
Source Type:	Portable Concrete Batch Plant	
Manufacturer/Model:	Erie Strayer	Truck Mix (T) or Central Mix (C)? C

INCREASE IN Production[1]

Maximum Hourly Production Rate:	200	cy/hr		Per manufacturer
Proposed Daily Production Rate:	2,500	cy/day	12.50	Hours of operation per day at max capacity
Proposed Maximum Annual Production Rate:	150,000	cy/year		
Cement Storage Silo Capacity:	4540	ft^3 of aerated cement		
Cement Storage Silo Large Compartment Capacity for cement only:	65%	of the silo capacity		
Cement Storage Silo small Compartment Capacity for cement or ash:	35%	of the silo capacity		

DEQ EI VERIFICATION WORKSHEET v. 012010
Tip: Blue text or numbers are meant to be changed.
Black text or numbers indicates it's hard-wired or calculated.
Review these before you change them.

Change in PM_{10} Emissions due to this PTC

Emissions Point	PM_{10} Emission Factor[1] (lb/cy)		Controlled Emission Rate, Max.	Controlled Emission Rate, 24-hour average		Controlled Emission Rate, annual average			
	Controlled	Uncontrolled	lb/hr[2]	lb/hr[3]	lb/day[3]	lb/hr[4]	T/yr[4]	Control Assumptions:	
Aggregate delivery to ground storage		0.0031	0.16	0.081	1.94	0.013	0.058	75%	Water Sprays at Operator's Discretion
Sand delivery to ground storage		0.0007	0.04	0.018	0.44	0.003	0.013	75%	Water Sprays at Operator's Discretion
Aggregate transfer to conveyor		0.0031	0.16	0.081	1.94	0.013	0.058	75%	Water Sprays at Operator's Discretion
Sand transfer to conveyor		0.0007	0.04	0.018	0.44	0.003	0.013	75%	Water Sprays at Operator's Discretion
Aggregate transfer to elevated storage		0.0031	0.16	0.081	1.94	0.013	0.058	75%	Water Sprays at Operator's Discretion
Sand transfer to elevated storage		0.0007	0.04	0.018	0.44	0.003	0.013	75%	Water Sprays at Operator's Discretion
Cement delivery to Silo (controlled EF)	**0.0001**		1.67E-02	**8.69E-03**	2.09E-01	1.43E-03	**6.26E-03**	0.00%	Baghouse is process equipment, use controlled EF
Cement supplement delivery to Silo (controlled EF)	**0.0002**		3.58E-02	**1.86E-02**	4.47E-01	3.06E-03	**1.34E-02**	0.00%	Baghouse is process equipment, use controlled EF
Weigh hopper loading (sand & aggregate batcher loading)		**0.0040**	7.90E-03	**4.12E-03**	9.88E-02	6.77E-04	**2.96E-03**	99.0%	Sealed boot (vents back to silo) or baghouse.
Truck mix loading,Table 11.12-2, "0.278 lb/ton of cement+flyash" x ((491 lb cement + 73 lb flyash)/cy concrete) / 2000 lb = 0.0784 lb/cy		**0.0000**	0.00	**0.00**	0.00	0.00	**0.00**	95.0%	Boot, enclosure, or equivalent
Central mix loading,Table 11.12-2, "0.134 lb/ton of cement+flyash" x ((491 lb cement + 73 lb flyash)/cy concrete) / 2000 lb = 0.0378 lb/cy		**0.0378**	0.08	**0.04**	0.95	0.01	**0.03**	99.0%	Baghouse control
Point Sources Total Emissions		**4.20E-02**	**1.36E-01**	**7.08E-02**	1.70E+00	**1.16E-02**	**5.10E-02**		
Process Fugitive Emissions		0.0114	0.57	0.30	7.13	0.05	0.21		
Facility Wide Total: Point Sources + Process Fugitives (Except for Road Dust and Windblown Dust)		0.0534	0.71	0.37	8.83	0.06	0.26		

POINT SOURCE EMISSIONS for FACILITY CLASSIFICATION[6]		Controlled EF	at 1,752,000 cy/yr	T/yr
Facility Classification Total PM[5]		**8.40E-03**		**7.36E+00**
Facility Classification Total PM10[5,7]		**4.21E-03**		**3.69E+00**

[1] The EFs were calculated using EFs in lb/ton of material handled from Table 11.12-2, typical composition per cubic yard of concrete (1865 lb aggregate, 1428 lbs sand, 491 lbs cement, 73 lbs cement supplement, and 20 gallons of water = 4024 lb/cy), and closely match Table 11.12-5 values (version 6/06) when rounded to the same number of figures. AP-42 lists the same EFs for uncontrolled and controlled emissions, so control estimates are based on the assumed control levels input on the right hand side of the table.

[2] Max. hourly rate includes reductions associated with control assumptions.

[3] Hourly emissions rate (24-hr average) = Max.hourly emissions rate x (hrs per day) / 24.
Daily emissions rate = max emissions rate (1-hr average) x proposed hrs/day.

[4] Annual average hourly emissions rate = EF (lb/cy) x proposed annual production rate (cy/yr) / (8760 hr/yr).
Annual emissions rate = EF (lb/cy) x proposed annual production rate (cy/yr) /(2000 lb/T)

[5] Controlled EFs for PM = 0.0002 (cement silo) + 0.0003 (flyash silo) +0.0079(weigh batcher)
for PM10 = 0.0001 (cement silo) + 0.0002 (flyash silo) +0.0040 (weigh batcher)

[6] Emissions for Facility Classification are based on baghouses as process equipment, 24-hr day, 8760 hr/yr = 4,800 cy/day, and 1,752,000 cy/yr

[7] Emissions for Facility Classification do not include truck mix loading emissions; this is typically considered a fugitive emission source for concrete batch plants.

Lead emissions			Increase in Emissions from this PTC				Emissions for Facility Classification	
Emissions Point	Lead Emission Factor[1] (lb/ton of material loaded)		Emission Rate, Max.	Emissions for Comparison with DEQ Modeling Threshold		Emission Rate, Quarterly Avg.		
	Controlled with fabric filter	Uncontrolled	lb/hr, 1-hr avg.[2]	lb/month[3]	T/yr[4]	lb/hr qtrly avg[5]		T/yr
Cement delivery to silo[2]	**1.09E-08**	7.36E-07	5.35E-07	2.03E-04	4.01E-04	2.79E-07	Point Source	2.34E-06
Cement supplement delivery to Silo[3]	**5.20E-07**	ND	3.80E-06	1.44E-03	2.85E-03	1.98E-06	Point Source	1.66E-05
Truck Loadout (with 99.9% control)[7]		**0.00E+00**	0.00E+00	0.00E+00	0.00E+00	0.00E+00	Fugitive	
Central Mix (with l30% control)		3.82E-07	2.15E-07	8.19E-05	1.62E-04	1.12E-07	Fugitive	
Total			**4.55E-06**	**1.73E-03**	**0.003**		**Point Sources**	**1.90E-05**
DEQ Modeling Threshold				100	0.6			
Modeling Required?				No	No			

[1] The emissions factors are from AP-42, Table 11.12-8 (version 06/06)
[2] Max. hourly rate = EF x pound of cement/yd^3 of concrete x max. hourly concrete production rate/(2000 lb/T)
[3] lb/mo = EF x pound of material/yd^3 of concrete x max. daily concrete production rate x (365/12)/(2000 lb/T
[4] T/yr = EF x pound of material/yd^3 of concrete x max. annual concrete production rate/(2000 lb/T
[5] lb/hr, qtrly avg = lb/mo x 3 months per qtr / (8760/4)hrs per qtr

Toxic Air Pollutant (TAPs) EMISSIONS INVENTORY, Concrete Batch Plant

3/17/2010 16:52

Facility Information

Company:	Ralph L. Wadsworth Construction
Facility ID:	777-00482
Permit No.:	P-2010.0024
Source Type:	Portable Concrete Batch Plant
Manufacturer:	Erie Strayer

Emissions estimates are based on EFs in AP-42, Table 11.12-8 (version 06/06) and the following composition of one yard of concrete:

Coarse aggregate		1865 pounds
Sand		1428 pounds
Cement		491 pounds
Cement supplement		73 pounds
Water		20 gallons
Concrete		4024 pounds

Truck Mix Loadout Factor: 0

Central Mix Batching Factor: 1

DEQ EI VERIFICATION WORKSHEET Version 032007
Tip: Blue text or numbers are meant to be changed.
Black text or numbers indicates it's hard-wired or calculated.
Review these before you change them.

Increase in Production

Maximum Hourly Production Rate:	200	cy/hr	
Proposed Daily Production Rate:	2,500	cy/day	
Proposed Maximum Annual Production Rate:	150,000	cy/year	

Uncontrolled (Unlimited Production Rate)

4,800 cy/day	24 hrs/day,
1,752,000 cy/year	7 day/wk,
	52 wks/year

TAP Emission Factors from AP-42, Table 11.12-8 (Version 06/06)

Emissions Point	Arsenic EF (lb/ton of material loaded)		Beryllium EF (lb/ton of material loaded)		Cadmium EF (lb/ton of material loaded)		Chromium EF (lb/ton of material loaded)		Manganese EF (lb/ton of material loaded)		Nickel EF (lb/ton of material loaded)		Phosphorus EF (lb/ton of material loaded)		Selenium EF (lb/ton of material loaded)		Chromium VI
	Controlled with Fabric filter	Uncontrolled	Controlled with Fabric filter	Uncontrolled	Controlled with Fabric filter	Uncontrolled	Controlled with Fabric filter	Uncontrolled	Controlled with Fabric filter	Uncontrolled	Controlled with Fabric filter	Uncontrolled	Controlled with Fabric filter	Uncontrolled	Controlled with Fabric filter	Uncontrolled	Percent of total Cr that is Cr+6
Cement delivery to silo (with baghouse)	4.24E-09	1.68E-06	4.86E-10	1.79E-08	4.86E-10	2.34E-07	2.90E-08	2.52E-07	1.17E-07	2.02E-04	4.18E-08	1.76E-05	ND	1.18E-05	ND	ND	20%
Cement supplement delivery to Silo(with baghouse)	1.00E-06	ND	9.04E-08	ND	1.98E-08	ND	1.22E-06	ND	2.56E-07	ND	2.28E-06	ND	3.54E-06	ND	7.24E-08	ND	30%
Truck Loadout (no boot or shroud)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	21.29%
Central Mix Batching (NO boot or shroud)	1.87E-08	2.32E-07	ND	ND	7.10E-10	1.18E-08	1.27E-07	1.42E-06	3.78E-06	6.12E-05	2.48E-07	3.28E-06	1.20E-06	2.02E-05	ND	ND	21.29%

UNCONTROLLED TAP EMISSIONS

Note: Includes baghouses as process equipment. 4,800 cy/day, and 1,752,000 cy/yr

Emissions Point	Arsenic		Beryllium		Cadmium		Chromium		Manganese		Nickel		Phosphorus		Selenium		Chromium VI
	lb/hr annual avg.	T/yr[4]	lb/hr annual avg.	T/yr	lb/hr annual avg.	T/yr	lb/hr 24-hr avg.	T/yr[5]	lb/hr 24-hr avg.	T/yr	lb/hr annual avg.	T/yr	lb/hr 24-hr avg.	T/yr	lb/hr 24-hr avg.	T/yr	lb/hr annual avg.
Cement delivery to silo (with baghouse)	2.08E-07	9.12E-07	2.39E-08	1.05E-07	2.39E-08	1.05E-07	1.42E-06	5.42E-05	5.74E-06	2.52E-05	2.05E-06	8.99E-06	5.79E-04	2.54E-03	ND	ND	2.85E-07
Cement supplement delivery to Silo(with baghouse)	7.30E-06	3.20E-05	6.60E-07	2.89E-06	1.45E-07	6.33E-07	8.91E-06	3.90E-05	1.87E-06	8.19E-06	1.66E-05	7.29E-05	2.58E-05	1.13E-04	5.29E-07	2.31E-06	2.67E-06
Truck Loadout (NO baghouse)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Central Mix Batching (NO boot or shroud)	1.31E-05	5.73E-05	ND	ND	6.66E-07	2.91E-06	8.01E-05	3.51E-04	3.45E-03	1.51E-02	1.85E-04	8.10E-04	1.14E-03	4.99E-03	ND	ND	1.71E-05
Sources Total	**2.06E-05**	9.02E-05	**6.84E-07**	2.99E-06	**8.34E-07**	3.65E-06	**9.04E-05**	4.44E-04	**3.46E-03**	1.52E-02	**2.04E-04**	8.92E-04	**1.74E-03**	7.64E-03	**5.29E-07**	2.31E-06	**2.00E-05**
IDAPA Screening EL (lb/hr)	1.50E-06		2.80E-05		3.70E-06		3.30E-02		3.33E-01		2.70E-05		7.00E-03		1.30E-02		5.60E-07
EXCEEDS EL?	Yes		No		No		No		No		Yes		No		No		Yes

Facility Classification: Total Annual HAPs Emissions: 2.42E-02 Tons per year

CONTROLLED TAP EMISSIONS

Note: Includes baghouses as process equipment. 2,500 cy/day, and 150,000 cy/year

Emissions Point	Arsenic		Beryllium		Cadmium		Chromium		Manganese		Nickel		Phosphorus		Selenium		Chromium VI
	lb/hr annual avg.	T/yr[4]	lb/hr annual avg.	T/yr	lb/hr annual avg.	T/yr	lb/hr 24-hr avg.	T/yr[5]	lb/hr 24-hr avg.	T/yr	lb/hr annual avg.	T/yr	lb/hr 24-hr avg.	T/yr	lb/hr 24-hr avg.	T/yr	lb/hr annual avg.
Cement delivery to silo (with baghouse)[1]	1.78E-08	7.81E-08	2.04E-09	8.95E-09	2.04E-09	8.95E-09	7.42E-07	5.34E-07	2.99E-06	2.15E-06	1.76E-07	7.70E-07	ND	ND	ND	ND	2.44E-08
Cement supplement delivery to Silo (with baghouse)2	6.25E-07	2.74E-06	5.65E-08	2.47E-07	1.24E-08	5.42E-08	3.12E-05	3.34E-06	6.55E-06	7.01E-07	1.43E-06	6.24E-06	9.05E-05	9.69E-06	2.75E-07	1.98E-07	2.29E-07
Truck Loadout (with baghouse)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Central Mix Batching (WITH boot or shroud)	1.12E-08	4.91E-08	ND	ND	5.70E-10	2.50E-09	4.17E-07	3.00E-07	1.80E-05	1.29E-05	1.58E-07	6.94E-07	5.93E-06	4.27E-06	ND	ND	1.46E-08
Sources Total	**6.54E-07**	2.86E-06	**5.85E-08**	2.56E-07	**1.50E-08**	6.56E-08	**3.24E-05**	4.17E-06	**2.75E-05**	1.58E-05	**1.76E-06**	7.70E-06	**9.65E-05**	1.40E-05	**2.75E-07**	1.98E-07	**2.68E-07**
IDAPA Screening EL (lb/hr)	1.50E-06		2.80E-05		3.70E-06		3.30E-02		3.33E-01		2.70E-05		7.00E-03		1.30E-02		5.60E-07
Percent of EL	43.60%		0.21%		0.41%		0.10%		0.0083%		6.52%		1.38%		0.0021%		47.81%
EXCEEDS EL?	No		No		No		No		No		No		No		No		No

Truck Loadout: 95.00% Boot, enclosure, or equivalent

Central Mix Batching: 99.00% Baghouse control

Sources Total: 4.50E-05 Tons per year

[1] lb/hr, annual average = EF x pound of cement / Yd[3] of concrete x annual concrete production rate / 2000lb/Ton / 8760 hr/yr; lb/hr, 24-hr = EF x pound of cement / Yd3 of concrete x daily concrete production rate / 2000lb/Ton / 24 hr/day

[2] lb/hr, annual average = EF x pound of cement supplement / Yd[3] of concrete x annual concrete production rate / 2000lb/Ton / 8760 hr/yr; lb/hr, 24-hr average = EF x pound of cement supplement / Yd3 of concrete x daily concrete production rate / 2000lb/Ton

[3] lb/hr, annual average = EF x pound of (cement + cement supplement) / Yd[3] of concrete x annual concrete production rate / 2000lb/Ton / 8760 hr/yr; lb/hr, 24-hr average = EF x pound of (cement + cement supplement) / Yd3 of concrete x daily concrete production

[4] T/yr = lb/hr, annual avg x 8760 hr/yr x (1T/2000 lb)

[5] T/yr = EF x pound of cement, or cement supplement, or cement + cement supplement x annual concrete production rate /2000 lb/ton / 2000 lb/ton

5 MMBtu/hr / 1,020 MMBtu/MMscf = 4.90E-03 MMscf/hr

Operating Assumptions: **24** hr/day, **4,380** hr/yr

Fuel Use:
0.118 MMscf/day
21.471 MMscf/year

Criteria Air Pollutants	Emission Factor	Emissions		CBP + Boiler Emissions	Modeling Threshold		Modeling Required ?	Modeling Threshold		Modeling Required?
	lb/MMscf	lb/hr	T/yr	T/yr	2002 Guidance			Case-by-Case		
NO2	100	4.90E-01	1.07E+00	1.07E+00	1	T/yr	YES	7	T/yr	No
CO	84	4.12E-01	9.02E-01	9.02E-01	14	lb/hr	No	70	lb/hr	No
PM10	7.6	3.73E-02	8.16E-02	1.33E-01	0.2	lb/hr	No	0.9	lb/hr	No
		3.73E-02	8.16E-02		1	T/yr	No	7	T/yr	No
SOx	0.6	2.94E-03	6.44E-03	6.44E-03	0.2	lb/hr	No	0.9	lb/hr	No
		2.94E-03	6.44E-03		1	T/yr	No	7	T/yr	No
VOC	5.5	2.70E-02	5.90E-02	5.90E-02	40	T/yr	No			
Lead	0.0005	2.45E-06	5.37E-06	3.42E-03	0.6	T/yr	No			
Lead, continued			5.37E-03	lb/quarter	10	lb/mo	No			
		TOTAL	2.12E+00	T/yr						

Note: 100 lb/mo Pb in guidance reduced by factor of 10 based on lates Pb NAAQS (reduced in 2008 from 1.5 ug/m3 to 0.15 ug/

Hazardous Air Pollutants (HAPs) and Toxic Air Pollutants (TAPs)					Exceeds EL/ Modeling Required?
	lb/MMscf	lb/hr	T/yr	EL (lb/hr)	
PAH HAPs					
2-Methylnaphthalene	2.40E-05	**5.88E-08**	**2.94E-08**	9.10E-05	No
3-Methylchloranthrene	1.80E-06	**4.41E-09**	**2.21E-09**	2.50E-06	No
Acenaphthene	1.80E-06	**4.41E-09**	**2.21E-09**	9.10E-05	No
Acenaphthylene	1.80E-06	**4.41E-09**	**2.21E-09**	9.10E-05	No
Anthracene	2.40E-06	**5.88E-09**	**2.94E-09**	9.10E-05	No
Benzo(a)anthracene	1.80E-06	**4.41E-09**	**2.21E-09**	9.10E-05	See POM
Benzo(a)pyrene	1.20E-06	**2.94E-09**	**1.47E-09**	2.00E-06	See POM
Benzo(b)fluoranthene	1.80E-06	**4.41E-09**	**2.21E-09**		See POM
Benzo(g,h,i)perylene	1.20E-06	**2.94E-09**	**1.47E-09**	9.10E-05	No
Benzo(k)fluoranthene	1.80E-06	**4.41E-09**	**2.21E-09**		See POM
Chrysene	1.80E-06	**4.41E-09**	**2.21E-09**		See POM
Dibenzo(a,h)anthracene	1.20E-06	**2.94E-09**	**1.47E-09**		See POM
Dichlorobenzene	1.20E-03	**2.94E-06**	**1.47E-06**	9.10E-05	No
Fluoranthene	3.00E-06	**7.35E-09**	**3.68E-09**	9.10E-05	No
Fluorene	2.80E-06	**6.86E-09**	**3.43E-09**	9.10E-05	No
Indeno(1,2,3-cd)pyrene	1.80E-06	**4.41E-09**	**2.21E-09**		See POM
Naphthalene	6.10E-04	5.46E-04	1.20E-03	3.33	No
Naphthalene	6.10E-04	**1.50E-06**	**7.48E-07**	9.10E-05	No
Phenanathrene	1.70E-05	**4.17E-08**	**2.08E-08**	9.10E-05	No
Pyrene	5.00E-06	**1.23E-08**	**6.13E-09**	9.10E-05	No
Polycyclic Organic Matter (POM)	7-PAH G	**2.79E-08**	**1.40E-08**	2.00E-06	No
Non-PAH HAPs					
Benzene	2.10E-03	**5.15E-06**	**2.57E-06**	8.00E-04	No
Formaldehyde	7.50E-02	**1.84E-04**	**9.19E-05**	5.10E-04	No
Hexane	1.80E+00	8.82E-03	1.93E-02	12	No
Toluene	3.40E-03	1.67E-05	3.65E-05	25	No
Non-HAP Organic Compounds					
7,12-Dimethylbenz(a)anthrace	1.60E-05	7.84E-08	1.72E-07		
Butane	2.10E+00	1.03E-02	2.25E-02		
Ethane	3.10E+00	1.52E-02	3.33E-02		
Pentane	2.60E+00	1.27E-02	2.79E-02	118	No
Propane	1.60E+00	7.84E-03	1.72E-02		
Metals (HAPs)					
Arsenic	2.00E-04	**4.90E-07**	**2.45E-07**	1.50E-06	No
Barium	4.40E-03	2.16E-05	4.72E-05	0.033	No
Beryllium	1.20E-05	**2.94E-08**	**1.47E-08**	2.80E-05	No
Cadmium	1.10E-03	**2.70E-06**	**1.35E-06**	3.70E-06	No
Chromium	1.40E-03	6.86E-06	1.50E-05	0.033	No
Cobalt	8.40E-05	4.12E-07	9.02E-07	0.0033	No
Copper	8.50E-04	4.17E-06	9.13E-06	0.013	No
Manganese	3.80E-04	1.86E-06	4.08E-06	0.067	No
Mercury	2.60E-04	1.27E-06	2.79E-06	0.003	No
Molybdenum	1.10E-03	5.39E-06	1.18E-05	0.333	No
Nickel	2.10E-03	**5.15E-06**	**2.57E-06**	2.70E-05	No
Selenium	2.40E-05	1.18E-07	2.58E-07	0.013	No
Vanadium	2.30E-03	1.13E-05	2.47E-05	0.003	No
Zinc	2.90E-02	1.42E-04	3.11E-04	0.667	No

NOTE: TAPs lb/hr emissions are 24-hour averages unless shown in bold. Bold emissions are annual averages for carcinogens.

Case-by-Case Modeling Thresholds may be with DEQ Approval

TOTAL CBP + BOILER EMISSIONS (POINT

Enter 0 in the hr/day and hr/yr cells if there is no diesel fired boiler

	5 MMBtu/hr /	140 MMBtu/10^3 gal =	3.57E-02 10^3 gal/hr	Fuel Use:
Operating Assumptions:		24 hr/day		857.14 gal/day
		4,380 hr/yr		156,429 gal/year
		0.0015% sulfur		

Criteria Air Pollutants	Emission Factor	Emissions		CBP + Boiler Emissions	Modeling Threshold		Modeling Required ?	Modeling Threshold		Modeling Required ?
	lb/10^3 gal	lb/hr	T/yr	T/yr	2002 Guidance			Case-by-Case		
NO2	20	7.14E-01	1.56E+00	1.56E+00	1	T/yr	YES	7	T/yr	No
CO	5	1.79E-01	3.91E-01	3.91E-01	14	lb/hr	No	70	lb/hr	No
PM10 (filterable + condensabl	3.3	1.18E-01	2.58E-01	3.09E-01	0.2	lb/hr	No	0.9	lb/hr	No
		1.18E-01	2.58E-01		1	T/yr	No	7	T/yr	No
SOx (SO2 + SO3)	0.216	7.71E-03	1.69E-02	1.69E-02	0.2	lb/hr	No	0.9	lb/hr	No
		7.71E-03	1.69E-02		1	T/yr	No	7	T/yr	No
VOC (TOC)	0.556	1.99E-02	4.35E-02	4.35E-02	40	T/yr	No			
Lead EF = 9 lb/10^{12} Btu	9	4.50E-05	9.86E-05	3.51E-03	0.6	T/yr	No			
Lead, continued			4.93E-02	lb/quarter	10	lb/mo	No			
		TOTAL	2.27E+00	T/yr						

Note: 100 lb/mo Pb in guidance reduced by factor of 10 based on latest Pb NAAQS (reduced in 2008 from 1.5 ug/m3 to 0.15 ug/m3)

Hazardous Air Pollutants (HAPs) and Toxic Air Pollutants (TAPs)					Exceeds EL/ Modeling Required?
	lb/10^3 gal	lb/hr	T/yr	EL (lb/hr)	
PAH HAPs					
Acenaphthene	2.11E-05	3.77E-07	1.88E-07	9.10E-05	No
Acenaphthylene	2.57E-07	**4.59E-09**	**2.29E-09**	9.10E-05	No
Anthracene	1.22E-06	**2.18E-08**	**1.09E-08**	9.10E-05	No
Benzo(a)anthracene	4.01E-06	**7.16E-08**	**3.58E-08**	9.10E-05	See POM
Benzo(a)pyrene				2.00E-06	See POM
Benzo(b,k)fluoranthene	1.48E-06	**2.64E-08**	**1.32E-08**		See POM
Benzo(g,h,i)perylene	2.26E-06	**4.04E-08**	**2.02E-08**	9.10E-05	No
Benzo(k)fluoranthene	0.00E+00	**0.00E+00**	**0.00E+00**		See POM
Chrysene	2.38E-06	**4.25E-08**	**2.13E-08**		See POM
Dibenzo(a,h)anthracene	1.67E-06	**2.98E-08**	**1.49E-08**		See POM
Dichlorobenzene				9.10E-05	No
Fluoranthene	4.84E-06	**8.64E-08**	**4.32E-08**	9.10E-05	No
Fluorene	4.47E-06	**7.98E-08**	**3.99E-08**	9.10E-05	No
Indeno(1,2,3-cd)pyrene	2.14E-06	**3.82E-08**	**1.91E-08**		See POM
Naphthalene	1.13E-03	7.37E-03	1.61E-02	3.33	No
Naphthalene	1.13E-03	**2.02E-05**	**1.01E-05**	9.10E-05	No
Phenanathrene	1.05E-05	**1.88E-07**	**9.38E-08**	9.10E-05	No
Pyrene	4.25E-06	**7.59E-08**	**3.79E-08**	9.10E-05	No
Polycyclic Organic Matter (POM)	7-PAH G	**2.09E-07**	**1.04E-07**	2.00E-06	No
Non-PAH HAPs					
Benzene	2.14E-04	**3.82E-06**	**1.91E-06**	8.00E-04	No
Ethyl benzene	6.36E-05	2.27E-06	4.97E-06	2.90E+01	No
Formaldehyde	3.30E-02	**5.89E-04**	**2.95E-04**	5.10E-04	YES
Hexane	1.80E+00	6.43E-02	1.41E-01	12	No
Toluene	6.20E-03	2.21E-04	4.85E-04	25	No
o-Xylene	1.09E-04			0.007	
Metals (HAPs)	**lb/10^{12} Btu**				
Arsenic	4.00E+00	1.00E-05	**5.00E-06**	1.50E-06	YES
Barium				0.033	No
Beryllium	3.00E+00	**7.50E-06**	**3.75E-06**	2.80E-05	No
Cadmium	3.00E+00	**7.50E-06**	**3.75E-06**	3.70E-06	YES
Chromium	3.00E+00	1.50E-05	3.29E-05	0.033	No
Cobalt				0.0033	No
Copper	6.00E+00	3.00E-05	6.57E-05	0.013	No
Manganese	6.00E+00	3.00E-05	6.57E-05	0.067	No
Mercury	3.00E+00	1.50E-05	3.29E-05	0.003	No
Molybdenum				0.333	No
Nickel	3.00E+00	**7.50E-06**	**3.75E-06**	2.70E-05	No
Selenium	1.50E+01	7.50E-05	1.64E-04	0.013	No
Vanadium				0.003	No
Zinc	4.00E+00	2.00E-05	4.38E-05	0.667	No

NOTE: TAPs lb/hr emissions are 24-hour averages unless shown in bold. Bold emissions are annual averages for carcinogens.

Case-by-Case Modeling Thresholds may be used with DEQ Approval

TOTAL CBP + BOILER EMISSIONS (POINT SOUR(

1,1,1-Trichloroethane 2.36E-04 Not a HAP (1,1,2 TCA is a HAP). Not a 585 or 586 TAP.

CURRENT PTC APPLICATION ESTIMATES

DEQ Verification Worksheets: Concrete Batch Plant (CBP) Facility Data			
Facility ID/AIRS No.	777-00482	Spreadsheet Date	3/17/2010 16:52
Permit No.	P-2010.0024		
Facility Owner/Company Name:	Ralph L. Wadsworth Construction		
Address:	PORTABLE		
City, State, Zip:			
Facility Contact:			
Contact Number/ e-mail:			
Use Short Term Source Factor on 586 ELs? Y/N	N		
Concrete Batch Plant AP-42 Section 11.12)	**Input (Bold Color) or Calculated Value (Black)**		
Concrete Batch Plant Make/Model	**Erie Strayer**		
Hourly Concrete Production, Tons/hour	**200**		
Max Production Per day, Tons per day	**2,500**		
Max Annual Concrete Production, Tons/year	**150,000**		
Min Hours of operation per year (annual/max hourly productior	750		

CAUTION: EI SUMMARY WORKSHEETS ALLOW ONLY ONE GENERATOR.

Do you have an internal combustion engine? **Yes**

Engine emissions cannot exceed those produced by a Tier 2 certified , If they do, the number of operting hours will be reduced

G2 Electrical Generator AP-42 Section 3.3 or 3.4 (diesel fueled)			
		Fuel Type(s)	**Generator Toggle**
Generator Make/Model	**Enter Info**	#2 Fuel Oil (Diesel)	**1**
Rated Engine capacity (hp)	**1,340.5**	Max Sulfur weight percent (w/o)	**0.0015%**
EF OPTIONS:		**Use EFs in lb/MMBtu fuel input**	
1 hp = 0.7456999 kW	0.7457	Max Operational Hours per Day	**24**
Avg brake-specific fuel consumption (BSFC) = 7000 Btu/hp-hr	7000	Max Operational Hours per Year	**4,380**
Fuel Heating Value, Btu/gal	137,030	Calculated Max Fuel Use Rate, gal/hr	68.48
		Calculated MMBtu/hr	9.38
Note: AP-42 Tables 3.3-x,3.4-x: avg diesel heating value is based on 19,300 Btu/lb with density equal 7.1 lb/gal=> Btu/gal =			137,030

Facility: **Ralph L. Wadsworth Construction**

3/17/2010 16:52 **Permit/Facility ID: P-2010.0024 777-00482**

Fuel Type Toggle =	1		1,341 kW Generator
Fuel Consumption Rate	68.48 gal/hr		
Calculated MMBtu/hr	9.3835 MMBtu/hr		
Max Daily Operation	24 hr/day		
Max Annual Operation	4,380 hrs/yr		

User Input Weight % Sulfur = 0.0015% SO2 EF = 1.01 x S

40 CFR 89.112 TIER 2 EMISSION STANDARDS (Apply to 2006+ yrs for kW>560 kW):

PM (presume PM = PM10)	0.20 g/kW-hr
CO	3.5 g/kW-hr
NMHC + NOx	6.4 g/kW-hr

Pollutant	Emission Factor[a] (lb/MMBtu)	Emissions (lb/hr)	Emissions (T/yr)	TAPs Emissions (lb/hr) **Annual** or 24-hr Average
PM [b]	0.1	0.938	2.05	
PM-10 (total) [d]	0.047	0.441	0.965	
P.M.-2.5		0.000		
CO [b]	0.82	7.713	16.89	
NOx [b]	1.503	14.104	30.89	
SO_2 [b] (total SOx presumed SO2)	0.001515	0.014	0.031	
VOC [b] (total TOC--> VOCs)	0.31	2.909	6.370	
Lead				
HCl [e]				
Dioxins[e]				
2,3,7,8-TCDD	**TIER 2 EMISSIONS**			
Total TCDD	PM/PM10	0.591	1.294	
1,2,3,7,8-PeCDD	CO	10.344	22.65	
Total PeCDD	NMHC + NOx	18.914	41.42	
1,2,3,4,7,8-HxCDD[c]				
1,2,3,6,7,8-HxCDD	1 lb =	453.5924	g	
1,2,3,7,8,9-HxCDD[c]				
Total HxCDD				
1,2,3,4,6,7,8-Hp-CDD[c]				
Total HpCDD[c]				
Octa CDD[c]				
Total PCDD[c]				
Furans[e]				
2,3,7,8-TCDF				
Total TCDF[c]				
1,2,3,7,8-PeCDF				
2,3,4,7,8-PeCDF				
Total PeCDF[c]				
1,2,3,4,7,8-HxCDF				
1,2,3,6,7,8-HxCDF				
2,3,4,6,7,8-HxCDF				
1,2,3,7,8,9-HxCDF				
Total HxCDF[c]				
1,2,3,4,6,7,8-HpCDF				
1,2,3,4,7,8,9-HpCDF				
Total HpCDF[c]				
Octa CDF[c]				
Total PCDF[c]				
Total PCDD/PCDF[c]				
Non-PAH HAPs				
Acetaldehyde[c]	2.52E-05	2.36E-04	5.18E-04	**1.18E-04**
Acrolein[c]	7.88E-06	7.39E-05	1.62E-04	7.39E-05
Benzene[c,e]	7.76E-04	7.28E-03	1.59E-02	**3.64E-03**
1,3-Butadiene[c,e]				
Ethylbenzene[e]				
Formaldehyde[c,e]	7.89E-05	7.40E-04	1.62E-03	**3.70E-04**
Hexane[e]				
Isooctane				
Methyl Ethyl Ketone[e]				
Pentane[e]				
Propionaldehyde[e]				
Quinone[e]				
Methyl chloroform[e]				
Toluene[c,e]	2.81E-04	2.64E-03	5.77E-03	2.64E-03
Xylene[c,e]	1.93E-04	1.81E-03	3.97E-03	1.81E-03
PAH, Total		1.98E-03		**9.92E-04**
POM (7-PAH Group)		4.22E-05		**2.11E-05**

Pollutant	Emission Factor[a] (lb/MMBtu)	Emissions (lb/hr)	Emissions (T/yr)	TAPs Emissions (lb/hr) **Annual** or 24-hr Average
PAH HAPs				
2-Methylnaphthalene				
3-Methylchloranthrene[e]				
Acenaphthene[c1]	4.68E-06	4.39E-05	9.62E-05	**2.20E-05**
Acenaphthylene[c1]	9.23E-06	8.66E-05	1.90E-04	**4.33E-05**
Anthracene[c1]	1.23E-06	1.15E-05	2.53E-05	**5.77E-06**
Benzo(a)anthracene[c1]	6.22E-07	5.84E-06	1.28E-05	**2.92E-06**
Benzo(a)pyrene[c1,e]	2.57E-07	2.41E-06	5.28E-06	**1.21E-06**
Benzo(b)fluoranthene[c1]	1.11E-06	1.04E-05	2.28E-05	**5.21E-06**
Benzo(e)pyrene				
Benzo(g,h,l)perylene[c1]	5.56E-07	5.22E-06	1.14E-05	**2.61E-06**
Benzo(k)fluoranthene[c1]	2.18E-07	2.05E-06	4.48E-06	**1.02E-06**
Chrysene[c1]	1.53E-06	1.44E-05	3.14E-05	**7.18E-06**
Dibenzo(a,h)anthracene[c1]	3.46E-07	3.25E-06	7.11E-06	**1.62E-06**
Dichlorobenzene				
Fluoranthene[c1]	4.03E-06	3.78E-05	8.28E-05	**1.89E-05**
Fluorene[c1]	1.28E-05	1.20E-04	2.63E-04	**6.01E-05**
Indeno(1,2,3-cd)pyrene[c1]	4.14E-07	3.88E-06	8.51E-06	**1.94E-06**
Naphthalene[c1,e]	1.30E-04	1.22E-03	2.67E-03	**6.10E-04**
Perylene				
Phenanthrene[c1]	4.08E-05	3.83E-04	8.38E-04	**1.91E-04**
Pyrene[c1]	3.71E-06	3.48E-05	7.62E-05	**1.74E-05**
Non-HAP Organic Compounds				
Acetone[e]				
Benzaldehyde				
Butane				
Butyraldehyde				
Crotonaldehyde[e]				
Ethylene				
Heptane				
Hexanal				
Isovaleraldehyde				
2-Methyl-1-pentene				
2-Methyl-2-butene				
3-Methylpentane				
1-Pentene				
n-Pentane				
Valeraldehyde				
Metals				
Antimony[e]				
Arsenic[e]				
Barium[e]				
Beryllium[e]				
Cadmium[e]				
Chromium[e]				
Cobalt[e]				
Copper[e]				
Hexavalent Chromium[e]				
Manganese[e]				
Mercury[e]				
Molybdenum[e]				
Nickel[e]				
Phosphorus[e]				
Silver[e]				
Selenium[e]				
Thallium[e]				
Vanadium[e]				
Zinc[e]				

a) Emission factors are from AP-42
b) AP-42, Table 3.4-1, Gaseous Emission Factors for Large Stationary Diesel and All Stationary Dual Fuel Engines, 10/96
c) AP-42, Table 3.4-3, Speciated Organic Compound Emission Factors for Large Uncontrolled Stationary Diesel Engines Emission Factor Rating E, 10/96
c1) AP-42, Table 3.4-4, PAH Emission Factors for Large Uncontrolled Stationary Diesel Engines, Emission Factor Rating E, 10/96
d) AP-42, Table 3.4-2, Particulate and Particle-Sizing Emission Factors for Large Uncontrolled Stationary Diesel Engines, Emission Factor Rating E, 10/96
e) IDAPA Toxic Air Pollutant

TAPs lb/hr rates are 24-hr averages except for those in bold text. Lb/hr rates for bold TAPs (carcinogens) are annual averages.

Facility: Ralph L. Wadsworth Construction
3/17/2010 16:52 Permit/Facility ID: P-2010.0024 777-00482

Max Hourly Production	200 cy/hr	82% T/hr is Aggregate =	164 cy/hr
Max Daily Production	2,500 cy/day	82% T/hr is Aggregate =	2,050 cy/day
Max Annual Production	150,000 cy/yr	82% T/hr is Aggregate =	123,000 cy/yr

Aggregate is considered both coarse and fine (sand).The 82% is based on 1,865 lb coarse aggregate, 1,428 lb sand, 564 lb cement/supplement and 167 lb water for a total of 4,024 lb concrete

Truck Mix Operations Drop Points, AP-42 11-12 (06/06)

$E = k (0.0032) x(U^a / M^b)+c =$ 9.71E-02 3.88E-02 lb/ton for PM10 5.83E-03 lb/ton for PM2.5

k = particle size multiplier	0.8 for PM	0.32 for PM10	0.048 for PM2.5
a = exponent	1.75 for PM	1.75 for PM10	1.75 for PM2.5
b = exponent	0.3 for PM	0.3 for PM10	0.3 for PM2.5
c = constant	0.013 for PM	0.0052 for PM10	0.00078 for PM2.5
U = mean wind speed =	10 mph		
M = moisture content =	6 %		

Mean wind spped: 10 mph was the average wind speed obtained during two separate EPA tests conducted at Cheney enterprises Cement plant in Roanoke,VA, 1994 (AP-42 11-12 06
Moisture Content: 4.17 % and 1.77% were the average percentages for sand and aggegate respectively. These values are based on EPA tests conducted at Cheney Enterprises Cement plant in Roanoke, VA, 1994. (AP-42 11-12 06/06).

Windspeed Variation Factors for AERMOD modeling:				PM10		PM2.5	
Wind Category	Upper windspeed (m/sec)	Avg windspeed (m/sec)	Avg windspeed (mph)	E @ avg mph	F = Eavg mph/ E@10mph	E @ avg mph	F = Eavg mph/ E@10mph
Cat 1:	1.54	0.77	1.72	6.75E-03	0.1738	1.01E-03	0.1738
Cat 2:	3.09	2.32	5.18	1.58E-02	0.4077	2.38E-03	0.4077
Cat 3:	5.14	4.12	9.20	3.43E-02	0.8831	5.15E-03	0.8831
Cat 4:	8.23	6.69	14.95	7.32E-02	1.885	1.10E-02	1.885
Cat 5:	10.80	9.52	21.28	1.31E-01	3.382	1.97E-02	3.382
Cat 6:	14.00	12.40	27.74	2.06E-01	5.298	3.09E-02	5.298

Central Mix Operations Drop Points, AP-42 11-12 (06/06)

$E = k (0.0032) x(U^a / M^b)+c =$ 2.08E-03 1.23E-03 lb/ton for PM10 2.54E-04 lb/ton for PM2.5

k = particle size multiplier,	0.19 for PM	0.13 for PM10	0.03 for PM2.5
a = exponent	0.95 for PM	0.45 for PM10	0.45 for PM2.5
b = exponent	0.9 for PM	0.9 for PM10	0.9 for PM2.5
c = constant	0.001 for PM	0.001 for PM10	0.0002 for PM2.5
U = mean wind speed =	10 mph		
M = moisture content =	6 %		

Mean wind spped: 10 mph was the average wind speed obtained during two separate EPA tests conducted at Cheney enterprises Cement plant in Roanoke,VA, 1994 (AP-42 11-12 06
Moisture Content: 4.17 % and 1.77% were the average percentages for sand and aggegate respectively. These values are based on EPA tests conducted at Cheney Enterprises

Windspeed Variation Factors for AERMOD modeling:				PM10		PM2.5	
Wind Category	Upper windspeed (m/sec)	Avg windspeed (m/sec)	Avg windspeed (mph)	E @ avg mph	F = Eavg mph/ E@10mph	E @ avg mph	F = Eavg mph/ E@10mph
Cat 1:	1.54	0.77	1.72	1.11E-03	0.8964	2.24E-04	0.8838
Cat 2:	3.09	2.32	5.18	1.87E-03	1.5160	2.40E-04	0.9456
Cat 3:	5.14	4.12	9.20	2.13E-03	1.7261	2.52E-04	0.9922
Cat 4:	8.23	6.69	14.95	2.41E-03	1.949	2.65E-04	1.0422
Cat 5:	10.80	9.52	21.28	2.65E-03	2.146	2.76E-04	1.0860
Cat 6:	14.00	12.40	27.74	2.86E-03	2.315	2.85E-04	1.1238

Conveyor and Scalping Screen Emission Points

Moisture/Control %:

Aggregate for CBP typically stabilizes between 5-6% by weight--> Apply additional 25% control to lb/hr, etc. for the higher moisture.

Sand aggregate for CBPs is 36%

Coarse aggregate for CBPs is 46%

Fine Aggegate (Sand) Transfer to Conveyor

Transfer from truck to conveyor: 164 cy/hr 2 Transfer Points

Pollutant	Emission Factor Table 11.12-5 CONVEYOR TRANSFER PT CONTROLLED (lb/cy)	Emissions Per Transfer Point				Total Emissions			
		Emissions (lb/hr) 1-hr Average	Emissions (lb/hr) 24-hr Average	Emissions (T/yr)	Emissions (lb/hr) Annual Average	Emissions (lb/hr) 1-hr Average	Emissions (lb/hr) 24-hr Average	Emissions (T/yr)	Emissions (lb/hr) Annual Average
PM (total)	0.0015	0.080	0.042	3.00E-02	6.84E-03	0.160	0.083	5.99E-02	1.37E-02
PM-10 (total)	7.00E-04	0.037	0.019	1.40E-02	3.19E-03	0.075	0.039	2.80E-02	6.38E-03

Coarse Aggegate Transfer to Conveyor

Transfer from truck to conveyor: 164 cy/hr 2 Transfer Points

Pollutant	Emission Factor Table 11.12-5 CONVEYOR TRANSFER PT CONTROLLED (lb/cy)	Emissions Per Transfer Point				Total Emissions			
		Emissions (lb/hr) 1-hr Average	Emissions (lb/hr) 24-hr Average	Emissions (T/yr)	Emissions (lb/hr) Annual Average	Emissions (lb/hr) 1-hr Average	Emissions (lb/hr) 24-hr Average	Emissions (T/yr)	Emissions (lb/hr) Annual Average
PM (total)	0.0064	0.442	0.230	1.66E-01	3.78E-02	0.883	0.460	3.31E-01	7.56E-02
PM-10 (total)	3.10E-03	0.214	0.111	8.02E-02	1.83E-02	0.428	0.223	1.60E-01	3.66E-02

Facility: Ralph L. Wadsworth Construction
3/17/2010 16:52 Permit P-2010.0024 Facility ID: 777-00482

G2 Electrical Generator > 600 hp (447 kW)

Fuel Type Toggle =	1	
Fuel Consumption Rate	68.48	gal/hr
Calculated MMBtu/hr	9.38	MMBtu/hr
Max Daily Operation	24	hr/day
Max Annual Operation	4,380	hrs/yr

Rated Power (kW): 1,341

Not EPA Certified:	No
Certified EPA Tier 1:	No
Certified EPA Tier 2:	Yes
Certified EPA Tier 3:	No
Blue Sky Engine:	No

Conversion Factors:

Avg brake-specific fuel consumption (BSFC) =	7000	Btu/hp-hr
1 hp =	0.746	kW
1 lb =	453.592	g

g/kW-hr x (lb/453g) x (hp-hr/7000 Btu) x (0.746 kW/hp) x 10^6 Btu/MMBtu = lb/MMBtu
g/kW-hr x 0.23486 = lb/MMBtu

Pollutant:	NOx	VOC (total TOC--> VOCs)		CO	PM=PM10
EMISSION FACTORS USED FOR GENERATOR (lb/MMBtu):	1.50	0.31		0.82	0.047

AP-42, Ch 3.3 or 3.4 (10/96) EMISSION FACTORS (diesel fueled, uncontrolled)

Pollutant:	NOx	VOC (total TOC--> VOCs)		CO	PM10
Emission Factor (lb/MMBtu)	3.2	0.9		0.85	0.13
Emission Factor (g/kW-hr))	13.63	3.83		3.62	0.55

Note: Rating for AP-42 PM10 EF of 0.0573 is "E" or Poor. Used Tier 1 PM EF and presumed PM = PM10

40 CFR 89 and 1039, EPA CERTIFIED GENERATOR EMISSION FACTORS (g/kW-hr converted to lb/MMBtu)

Rated Power (kW)	Tier	Applicable?	Model Year[1]	NOx	HC	NMHC + NOx	CO	PM = PM10
kW< 8	1	0	2000	---	0.36	2.47	1.88	0.23
kW< 8	2	0	2005	---	0.36	1.76	1.88	0.19
kW< 8	4	0	2008	---	---	1.76	1.88	0.09
kW< 8	BlueSky	0	n/a	---	0.36	1.08	1.88	0.11
8 ≤ kW < 19	1	0	2000	---	0.36	2.23	1.55	0.19
8 ≤ kW < 19	2	0	2005	---	0.36	1.76	1.55	0.19
8 ≤ kW < 19	4	0	2008	---	---	1.76	1.55	0.09
8 ≤ kW < 19	BlueSky	0	n/a	---	0.36	1.06	1.55	0.11
19 < kW < 37	1	0	1999	---	0.36	2.23	1.29	0.19
19 ≤ kW < 37	2	0	2004	---	0.36	1.76	1.29	0.14
19 ≤ kW < 37	4	0	2008	---	---	1.10	1.29	0.007
19 ≤ kW < 37	BlueSky	0	n/a	---	0.36	1.06	1.29	0.085
37 ≤ kW < 75	1	0	1998	2.16	0.36	---	---	---
37 ≤ kW < 75	2	0	2004	---	0.36	1.76	1.17	0.09
37 ≤ kW < 75	3	0	2008	---	0.36	1.10	1.17	0.09
37 ≤ kW < 75	4	0	2008	---	---	1.10	1.17	0.007
37 ≤ kW < 75	BlueSky	0	n/a	---	0.36	1.10	1.17	0.056
75 < kW < 130	1	0	1997	2.16	0.36	---	---	---
75 ≤ kW < 130	2	0	2003	---	0.36	1.55	1.17	0.07
75 ≤ kW < 130	3	0	2007	---	0.36	0.94	1.17	0.07
75 ≤ kW < 130	4	0	2008	0.09	0.04	---	1.17	0.005
75 ≤ kW < 130	BlueSky	0	n/a	---	0.36	0.94	1.17	0.042
130 ≤ kW < 225	1	0	1996	2.16	0.31	---	2.68	0.13
130 ≤ kW < 225	2	0	2003	---	0.31	1.55	0.82	0.05
130 ≤ kW < 225	3	0	2006	---	0.31	0.94	0.82	0.05
130 ≤ kW < 560	4	0	2008	0.09	0.04	---	0.82	0.005
130 ≤ kW ≤ 560	BlueSky	0	n/a	---	0.31	0.94	0.82	0.028
225 ≤ kW < 450	1	0	1996	2.16	0.31	---	2.68	0.13
225 ≤ kW < 450	2	0	2001	---	0.31	1.50	0.82	0.05
225 ≤ kW < 450	3	0	2006	---	0.31	0.94	0.82	0.05
450 ≤ kW ≤ 560	1	0	1996	2.16	0.31	---	2.68	0.13
450 ≤ kW ≤ 560	2	0	2002	---	0.31	1.50	0.82	0.05
450 ≤ kW ≤ 560	3	0	2006	---	0.31	0.94	0.82	0.05
kW > 560	1	0	2000	2.16	0.31	---	2.68	0.13
kW > 560	2	1	2006	---	0.31	1.50	0.82	0.05
kW > 560	BlueSky	0	n/a	---	0.31	0.89	0.82	0.028

40 CFR 89 and 1039, EPA CERTIFIED GENERATOR EMISSION FACTORS FOR GENERATOR (lb/MMBtu)

Rated Power (kW)	Tier	Applicable?	Model Year[1]	NOx	HC	NMHC + NOx	CO	PM10
kW< 8	1	0	2000	0.00	0.00	0.00	0.00	0.00
kW< 8	2	0	2005	0.00	0.00	0.00	0.00	0.00
kW< 8	4	0	2008	0.00	0.00	0.00	0.00	0.00
kW< 8	BlueSky	0	n/a	0.00	0.00	0.00	0.00	0.00
8 ≤ kW < 19	1	0	2000	0.00	0.00	0.00	0.00	0.00
8 ≤ kW < 19	2	0	2005	0.00	0.00	0.00	0.00	0.00
8 ≤ kW < 19	4	0	2008	0.00	0.00	0.00	0.00	0.00
8 ≤ kW < 19	BlueSky	0	n/a	0.00	0.00	0.00	0.00	0.00
19 ≤ kW < 37	1	0	1999	0.00	0.00	0.00	0.00	0.00
19 ≤ kW < 37	2	0	2004	0.00	0.00	0.00	0.00	0.00
19 ≤ kW < 37	4	0	2008	0.00	0.00	0.00	0.00	0.00
19 ≤ kW < 37	BlueSky	0	n/a	0.00	0.00	0.00	0.00	0.00
37 ≤ kW < 75	1	0	1998	0.00	0.00	0.00	0.00	0.00
37 ≤ kW < 75	2	0	2004	0.00	0.00	0.00	0.00	0.00
37 ≤ kW < 75	3	0	2008	0.00	0.00	0.00	0.00	0.00
37 ≤ kW < 75	4	0	2008	0.00	0.00	0.00	0.00	0.00
37 ≤ kW < 75	BlueSky	0	n/a	0.00	0.00	0.00	0.00	0.00
75 ≤ kW < 130	1	0	1997	0.00	0.00	0.00	0.00	0.00
75 ≤ kW < 130	2	0	2003	0.00	0.00	0.00	0.00	0.00
75 ≤ kW < 130	3	0	2007	0.00	0.00	0.00	0.00	0.00
75 ≤ kW < 130	4	0	2008	0.00	0.00	0.00	0.00	0.00
75 ≤ kW < 130	BlueSky	0	n/a	0.00	0.00	0.00	0.00	0.00
130 ≤ kW < 225	1	0	1996	0.00	0.00	0.00	0.00	0.00
130 ≤ kW < 225	2	0	2003	0.00	0.00	0.00	0.00	0.00
130 ≤ kW < 225	3	0	2006	0.00	0.00	0.00	0.00	0.00
130 ≤ kW < 560	4	0	2008	0.00	0.00	0.00	0.00	0.00
130 ≤ kW ≤ 560	BlueSky	0	n/a	0.00	0.00	0.00	0.00	0.00
225 ≤ kW < 450	1	0	1996	0.00	0.00	0.00	0.00	0.00
225 ≤ kW < 450	2	0	2001	0.00	0.00	0.00	0.00	0.00
225 ≤ kW < 450	3	0	2006	0.00	0.00	0.00	0.00	0.00
450 ≤ kW ≤ 560	1	0	1996	0.00	0.00	0.00	0.00	0.00
450 ≤ kW ≤ 560	2	0	2002	0.00	0.00	0.00	0.00	0.00
450 ≤ kW ≤ 560	3	0	2006	0.00	0.00	0.00	0.00	0.00
kW > 560	1	0	2000	0.00	0.00	0.00	0.00	0.00
kW > 560	2	1	2006	0.00	0.31	1.50	0.82	0.05
kW > 560	BlueSky	0	n/a	0.00	0.00	0.00	0.00	0.00
EMISSION FACTORS FOR GENERATOR (lb/MMBTU):				**0.00**	**0.31**	**1.50**	**0.82**	**0.047**

Final Concrete Batch Plant Emissions Inventory

Listed Below are the emissions estimates for the units selected.

Company:	Ralph L. Wadsworth Construction
Facility ID:	777-00482
Permit No.:	P-2010.0024
Source Type:	Portable Concrete Batch Plant
Manufacturer/Model:	Erie Strayer

Production

Maximum Hourly Production Rate:	200	cy/hr
Proposed Daily Production Rate:	2500	cy/day
Proposed Maximum Annual Production Rate:	150000	cy/year

		Tons/year						
Emissions Units		PM_{10}	SO_2	NO_x	CO	VOC	Lead	THAPs
CBP Type:	**Central Mix**	0.05	NA	NA	NA	NA	1.90E-05	
Water Heater/Boiler:	**5 MMBtu/hr Diesel**	0.258	0.017	1.564	0.391	0.043	9.86E-05	
Diesel Generator*:	**1340.5 kW ,Tier 2 generator**	0.97	0.03	30.90	16.90	6.37	NA	
	Transfer/Drop Points	0.19	NA	NA	NA	NA	NA	
	Totals	**1.46**	**0.05**	**32.46**	**17.29**	**6.42**	**1.18E-04**	**5.31E-02**
		Pounds/hour						
		PM_{10}	SO_2	NO_x	CO	VOC	Lead	THAPs
CBP Type:	**Central Mix**	0.01	NA	NA	NA	NA	4.55E-06	
Water Heater/Boiler:	**5 MMBtu/hr Diesel**	0.118	0.008	0.714	0.179	0.020	4.50E-05	
Diesel Generator*:	**1340.5 kW ,Tier 2 generator**	0.44	0.14	14.11	7.72	2.91	NA	
	Transfer/Drop Points	0.26	NA	NA	NA	NA	NA	
	Totals	**0.83**	**0.15**	**14.82**	**7.90**	**2.93**	**4.95E-05**	**1.94E-02**

* The generator may run : **4380** hr/yr

HAPS & TAPS Emissions Inventory

Metals	HAP	TAP	lb/hr	T/yr	Averaging Period	EL lb/hr	Exceeded?
Arsenic	X	X	1.14E-06	3.11E-06	Annual	1.50E-06	No
Barium		X	2.16E-05	4.72E-05	24-hour	3.30E-02	No
Beryllium	X	X	8.80E-08	2.71E-07	Annual	2.80E-05	No
Cadmium	X	X	2.71E-06	1.41E-06	Annual	3.70E-06	No
Cobalt	X	X	4.12E-07	9.02E-07	24-hour	3.30E-03	No
Copper		X	4.17E-06	9.13E-06	24-hour	1.30E-02	No
Chromium	X	X	1.06E-05	1.50E-05	24-hour	3.30E-02	No
Manganese	X	X	2.94E-05	1.99E-05	24-hour	3.33E-01	No
Mercury	X	X	1.27E-06	2.79E-06	24-hour	3.00E-03	No
Molybdenum		X	5.39E-06	1.18E-05	24-hour	2.70E-05	No
Nickel	X	X	6.91E-06	1.03E-05	Annual	2.70E-05	No
Phosphorus	X	X	9.65E-05	1.40E-05	24-hour	7.00E-03	No
Selenium	X	X	3.93E-07	4.56E-07	24-hour	1.30E-02	No
Vanadium		X	1.13E-05	2.47E-05	24-hour	3.00E-03	No
Zinc		X	1.42E-04	3.11E-04	24-hour	6.67E-01	No
Chromium VI	X	X	2.68E-07	1.17E-06	Annual	5.60E-07	No
Non PAH Organic Compunds							
Pentane		X	7.84E-03	1.72E-02	24-hour	118	No
Methyl Ethyl Ketone		X	0.00E+00	0.00E+00	24-hour	39.3	No
Non-PAH HAPs							
Acetaldehyde	X	X	1.18E-04	5.18E-04	Annual	3.00E-03	No
Acrolein	X	X	7.39E-05	1.62E-04	24-hour	1.70E-02	No
Benzene	X	X	3.65E-03	1.59E-02	Annual	8.00E-04	Yes
1,3 - Butadiene	X	X	0.00E+00	0.00E+00	Annual	2.40E-05	No
Ethyl Benzene	X	X	0.00E+00	0.00E+00	24-hour	29	No
Formaldehyde	X	X	5.54E-04	1.71E-03	Annual	5.10E-04	Yes
Hexane	X	X	8.82E-03	1.93E-02	24-hour	12	No
Isooctane	X		0.00E+00	0.00E+00	NA	NA	NA
Methyl Chloroform	X	X	0.00E+00	0.00E+00	24-hour	127	No
Propionaldehyde	X	X	0.00E+00	0.00E+00	24-hour	2.87E-02	No
Quinone	X	X	0.00E+00	0.00E+00	24-hour	2.70E-02	No
Toluene	X	X	2.65E-03	5.81E-03	24-hour	25	No
o-Xylene	X	X	1.81E-03	3.97E-03	24-hour	7.00E-03	No
PAH HAPs							
2-Methylnaphthalene	X	X	5.88E-08	2.94E-08	Annual	9.10E-05	No
3-Methylchloranthrene	X	X	4.41E-09	2.21E-09	Annual	2.50E-06	No
Acenaphthene	X	X	2.20E-05	9.62E-05	Annual	9.10E-05	No
Acenaphthylene	X	X	4.33E-05	1.90E-04	Annual	9.10E-05	No
Anthracene	X	X	5.78E-06	2.53E-05	Annual	9.10E-05	No
Benzo(a)anthracene	X	X	2.92E-06	1.28E-05	Annual	9.10E-05	No
Benzo(a)pyrene	X	X	1.21E-06	5.28E-06	Annual	2.00E-06	No
Benzo(b)fluoranthene	X	X	5.21E-06	2.28E-05	Annual	2.00E-06	Yes
Benzo(e)pyrene	X	X	0.00E+00	0.00E+00	Annual	2.00E-06	No
Benzo(g,h,i)perylene	X	X	2.61E-06	1.14E-05	Annual	9.10E-05	No
Benzo(k)fluoranthene	X	X	1.03E-06	4.48E-06	Annual	2.00E-06	No
Chrysene	X	X	7.18E-06	3.14E-05	Annual	2.00E-06	Yes
Dibenzo(a,h)anthracene	X	X	1.63E-06	7.11E-06	Annual	2.00E-06	No
Dichlorobenzene	X	X	2.94E-06	1.47E-06	Annual	9.10E-05	No
Fluoranthene	X	X	1.89E-05	8.28E-05	Annual	9.10E-05	No
Fluorene	X	X	6.01E-05	2.63E-04	Annual	9.10E-05	No
Indeno(1,2,3-cd)pyrene	X	X	1.95E-06	8.51E-06	Annual	2.00E-06	No
Naphthalene	X	X	1.16E-03	3.87E-03	24-hour	3.33	No
Naphthalene	X	X	1.50E-06	7.48E-07	24-hour	9.10E-05	No
Perylene	X		0.00E+00	0.00E+00	NA	NA	NA
Phenanathrene	X	X	1.91E-04	8.38E-04	Annual	9.10E-05	Yes
Pyrene	X	X	1.74E-05	7.62E-05	Annual	9.10E-05	No
Polycyclic Organic Matter (POM)	X	X	2.11E-05	1.40E-08	Annual	2.00E-06	Yes

Total HAPs Emissions: 1.94E-02 5.31E-02 1.93E-02

P-2010.0024 RALPH L. WADSWORTH CBP SITE-SPECIFIC MODELING - SUBMITTED ANALYSES (JBR)

POINT SOURCES

	Source ID	Stack Release Type (Beta)	Source Description	Easting (X)	Northing (Y)	Base Elevation	Stack Height	Temper-ature	Exit Velocity	Stack Diameter	PM10	PM10ANN	NOX	SO2	SO2ANN	ARSEN	CHROM_M	CHROM_VI	NICKEL	BENZ
				(m)	(m)	(m)	(ft)	(°F)	(m/s)	(ft)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)
1	GEN_600		600kw Gen-set	285106.83	4716288.6	1265.02	12.5	956.102	121.70	0.83	2.48E-02	2.27E-03	0.896	3.218	0.294	0	0	0	0	1.45E-04
2	GEN_75		75kw Gen-set	285106.66	4716293.5	1264.96	6	1094	17.41	0.30	4.21E-02	3.85E-03	0.051	0.206	0.019	0	0	0	0	2.18E-05

VOLUME SOURCES

	Source ID		P	Easting (X)	Northing (Y)	Base Elevation	Release Height		Horizontal Dimension	Vertical Dimension	PM10	PM10ANN	NOX	SO2	SO2ANN	ARSEN	CHROM_M	CHROM_VI	NICKEL	BENZ
				(m)	(m)	(m)	(ft)		(m)	(m)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)
3	V.001		Aggregate Delivery to Ground Storage	284982.59	4716352	1264.94	8.20		4.0	4.0	0.68	2.51E-02	0	0	0	0	0	0	0	0
4	V.002		Sand Delivery to Ground Storage	284982.19	4716323	1265.1	8.20		4.0	4.0	0.15	6.85E-03	0	0	0	0	0	0	0	0
5	V.003		Aggregate Transfer to Conveyor	285004.06	4716351	1264.92	11.48		2.0	2.0	0.68	2.51E-02	0	0	0	0	0	0	0	0
6	V.004		Sand Transfer to Conveyor	285002.84	4716321	1264.96	11.48		2.0	2.0	0.15	6.85E-03	0	0	0	0	0	0	0	0
7	V.005		Aggregate Transfer to Elevated Storage	285041.22	4716302	1264.89	45.93		2.0	2.0	0.68	2.51E-02	0	0	0	0	0	0	0	0
8	V.006		Sand Transfer to Elevated Storage	285022.38	4716292.5	1265.07	45.93		2.0	2.0	0.15	6.85E-03	0	0	0	0	0	0	0	0
9	V.007		Cement\Fly Ash Delivery to Silo	285071.66	4716327.5	1264.62	45.93		2.0	2.0	0.07	2.28E-03	0	0	0	3.08E-07	3.69E-06	1.21E-07	7.69E-07	0
10	V.008		Weigh hopper loading	285042.86	4716280.9	1265.31	32.81		2.0	2.0	0.84	3.20E-02	0	0	0	0	0	0	0	0
11	V.009		Central mix loading	285042.86	4716280.9	1265.31	22.97		2.0	2.0	0.41	1.60E-02	0	0	0	3.08E-07	1.92E-05	5.25E-07	4.11E-06	0
12	V.010		Stock Pile Loading/Unloading	284953.84	4716336	1265.04	11.48		10.0	5.0	0.46	6.16E-02	0	0	0	0	0	0	0	0

DEQ Comment: Excessive exit velocity 121.70 m/s = 272.24 mph 1609.344

DEQ Comment: Exit temperatures appear to be excessively high

P-2010.0024 RALPH L. WADSWORTH CBP SITE-SPECIFIC MODELING **DEQ VERIFICATION MODEL**

POINT SOURCES

**Arsenic and POM emissions were multiplied by 1E+06 for input to the model

	Source ID	Stack Release Type (Beta)	Source Description	Easting (X)	Northing (Y)	Base Elevation	Stack Height	Temper-ature	Exit Velocity	Stack Diameter	PM10	PM10ANN	NOXANN	SO2ST	SO2ANN	ARSENIC	POM7PAH
				(m)	(m)	(m)	(ft)	(°F)	(m/s)	(ft)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)
1	GEN_600		600kw Gen-set	285106.83	4716288.6	1266.03	12.5	700	25	0.83	0.031	0.031	12.24	0.406	0.406		31.60
2	GEN_75		75kw Gen-set	285106.66	4716293.5	1266	6	700	17.412	0.3	0.0528	0.0528	0.706	0.0258	0.025		3.03

	Source ID		Source Description	Easting (X)	Northing (Y)	Base Elevation	Release Height		Horizontal Dimension	Vertical Dimension	PM10	PM10ANN	NOXANN	SO2ST	SO2ANN	ARSENIC	POM7PAH
				(m)	(m)	(m)	(m)		(m)	(m)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)
3	V.001		Aggregate Delivery to Ground Storage	284982.59	4716352	1265.88	2.5		4	4	0.217	0.217					
4	V.002		Sand Delivery to Ground Storage	284982.19	4716323	1265.95	2.5		4	4	0.049	0.049					
5	V.003		Aggregate Transfer to Conveyor	285004.06	4716351	1265.86	3.5		2	2	0.217	0.217					
6	V.004		Sand Transfer to Conveyor	285002.84	4716321	1265.86	3.5		2	2	0.049	0.049					
7	V.005		Aggregate Transfer to Elevated Storage	285041.22	4716302	1265.93	14		2	2	0.217	0.217					
8	V.006		Sand Transfer to Elevated Storage	285022.38	4716292.5	1266.16	14		2	2	0.049	0.049					
9	V.007		Cement\Fly Ash Delivery to Silo	285071.66	4716327.5	1265.7	14		2	2	0.084	0.084				10.491	
10	V.008		Weigh hopper loading	285042.86	4716280.9	1266.23	10		2	2	1.064	1.064					
11	V.009		Central mix loading	285042.86	4716280.9	1266.23	7		2	2	0.524	0.524				1.48	

CONCRETE BATCH PLANT

Process	Fugitive or Non-Fugitive	Throughput		Emission Factors (lb/yd^3)			PM_{10} Emissions				TSP Emissions		E-Factor Reference
		yd^3/hr[1]	yd^3/yr	PM_{10}	TSP	BMP Controls (DEQ)	lb/hr	DEQ (lb/hr)	tpy	DEQ (TPY)	lb/hr	tpy	
Aggregate Delivery to Ground Storage - Controlled*	Fugitive	280	72,000	0.0031	0.0064	75%	0.868	0.217	0.11	0.028	1.79	0.23	AP-42, 5th Edition, Table 11.12-6
Sand Delivery to Ground Storage - Controlled*	Fugitive	280	72,000	0.0007	0.0015	75%	0.196	0.049	0.03	0.006	0.42	0.05	AP-42, 5th Edition, Table 11.12-6
Aggregate Transfer to Conveyor - Controlled*	Fugitive	280	72,000	0.0031	0.0064	75%	0.868	0.217	0.11	0.028	1.79	0.23	AP-42, 5th Edition, Table 11.12-6
Sand Transfer to Conveyor - Controlled*	Fugitive	280	72,000	0.0007	0.0015	75%	0.196	0.049	0.03	0.006	0.42	0.05	AP-42, 5th Edition, Table 11.12-6
Aggregate Transfer to Elevated Storage - Controlled*	Fugitive	280	72,000	0.0031	0.0064	75%	0.868	0.217	0.11	0.028	1.79	0.23	AP-42, 5th Edition, Table 11.12-6
Sand Transfer to Elevated Storage - Controlled*	Fugitive	280	72,000	0.0007	0.0015	75%	0.196	0.049	0.03	0.006	0.42	0.05	AP-42, 5th Edition, Table 11.12-6
Cement Delivery to Silo - Controlled	Non-Fugitive	280	72,000	0.0001	0.0002		0.028		0.004		0.06	0.01	AP-42, 5th Edition, Table 11.12-6
Cement Supplement (flyash) Delivery to Silo - Controlled	Non-Fugitive	280	72,000	0.0002	0.0003		0.056		0.01		0.08	0.01	AP-42, 5th Edition, Table 11.12-6
Cement and Flyash Delivery to Silo (combined)							*0.084*						
Weigh hopper loading - Controlled	Non-Fugitive	280	72,000	0.0038	0.0079		1.064		0.14		2.21	0.28	AP-42, 5th Edition, Table 11.12-6
Central mix loading - Controlled	Non-Fugitive	280	72,000	0.0019	0.0014		0.524		0.07		0.38	0.05	AP-42, 5th Edition, Equation 11.12-2
Total	**Fugitive**						**3.19**	**0.80**	**0.41**		**6.64**	**0.85**	
Total	**Non-Fugitive**						**1.67**	**1.67**	**0.21**	**0.21**	**2.73**	**0.35**	

* DEQ Note: Controlled and uncontrolled emission factors are the same for these fugitive sources. DEQ requires permittees to reasonably control these emissions, so typically allows an additional 75% control based on permittees using best management practices to control fugitive dusts. Although controlled and uncontrolled EFs are also the same for emissions routed through a baghouse, DEQ presumed that these values are better quantified and reflect the use of a typical baghouse or cartridge filter (i.e., EFs already include control).

DEQ Check: Central mix loading Eqn 11.12-2: = 0.282 x 0.278 (Table 11.12-2 factor) = 0.0784 Flyash and cement silo filling emissions were combined in the JBR model

1 yd^3 of ready-mix = 4024 lbs
1 yd^3 of ready-mix has 1865 lbs of coarse aggregate
1 yd^3 of ready-mix has 1428 lbs of fine aggregate

Tons of Product per yr			
	Fines		Coarse
144,864	51408.00		67140.00

1 - This is the rated capacity of the equipment not the actual usage rate

METAL EMISSIONS

@72,000 cy/yr

Presumes 60 days at 12 hours per day

Material	Central Mix	Cement (T/yr)	Fly Ash (T/yr)	Hour/year
Throughput	144,864	17,676	2,628	720

Process	Emission Factors (lb/ton of material)			
	As	Be	Cd	Ch
Cement Silo Filling w/Fabirc Filter	4.24E-09	4.86E-10	4.86E-10	2.90E-08
Fly Ash Silo Filling w/Fabric Filter	1.00E-06	9.04E-08	1.98E-08	1.22E-06
Central Mix Batching w/Fabric Filter	1.87E-08	ND	7.10E-10	1.27E-07

Process	As		Be		Cd		Total CR		Non Hex CR		Hexavalent Cr	
	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY
Cement Silo Filling w/Fabirc Filter	1.04E-07	3.75E-08	1.19E-08	4.30E-09	1.19E-08	4.30E-09	7.12E-07	2.56E-07	5.70E-07	2.05E-07	1.42E-07	5.13E-08
Fly Ash Silo Filling w/Fabric Filter	3.65E-06	1.31E-06	7.23E-08	1.19E-07	4.86E-07	2.60E-08	4.45E-06	1.60E-06	3.12E-06	1.12E-06	1.34E-06	4.81E-07
Central Mix Batching w/Fabric Filter	3.76E-06	1.35E-06	ND	ND	1.43E-07	5.14E-08	2.56E-05	9.20E-06	1.92E-05	6.90E-06	6.39E-06	2.30E-06
Total Emissions	**7.52E-06**	**2.71E-06**	**8.42E-08**	**1.23E-07**	**6.41E-07**	**8.17E-08**	**3.07E-05**	**1.11E-05**	**2.29E-05**	**8.23E-06**	**7.87E-06**	**2.83E-06**

Emission Factors (lb/ton of material)				
Pb	Mn	Ni	P	Se
1.09E-08	1.17E-07	4.18E-08	ND	ND
5.20E-07	2.56E-07	2.28E-06	3.54E-06	7.24E-08
3.66E-08	3.78E-06	2.48E-07	1.20E-06	ND

Pb		Mn		Ni		P		Se	
lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY
2.68E-07	9.63E-08	2.87E-06	1.03E-06	1.03E-06	3.69E-07	ND	ND	ND	ND
1.90E-06	6.83E-07	9.34E-07	3.36E-07	8.32E-06	3.00E-06	1.29E-05	4.65E-06	2.64E-07	9.51E-08
7.36E-06	2.65E-06	7.61E-04	2.74E-04	4.99E-05	1.80E-05	2.41E-04	8.69E-05	ND	ND
9.53E-06	**3.43E-06**	**7.64E-04**	**2.75E-04**	**5.92E-05**	**2.13E-05**	**2.54E-04**	**9.16E-05**	**2.64E-07**	**9.51E-08**

Total HAP Metals	
lb/hr	TPY
5.01E-06	1.80E-06
3.30E-05	1.18E-05
1.09E-03	3.92E-04
1.13E-03	**4.06E-04**

ND = No Data

4024 lb Readymix = 1yd^3 of Readymix ; 73lbs of which is Fly Ash ; 491lbs of which is Cement

[2]AP-42, Fifth Edition, Table 11.12-6

DEQ VERIFICATION ANALYSES EMISSION ESTIMATES

Maximum **72,000 cy/yr** **491 lb cement/cy** **20%** of Total Chromium is in Hexavalent form

Worst case 24 hr= 280 cy/hr x 24 **6720 cy/day** **73 lb flyash/cy** **30%** of Total Chromium is in Hexavalent form

21.29% of Total Chromium in cement + flyash mix is Cr+6

	Annual	*Annual*	*Annual*			*24-hr*	*Annual*	*24-hr*	*Annual*	*24-hr*	*24-hr*
Process	**As**	**Be**	**Cd**	**Total CR**		**Non Hex CR**	**Hexavalent Cr**	**Mn**	**Ni**	**P**	**Se**
	lb/hr	lb/hr	lb/hr	lb/hr-24hr	lb/hr-Ann	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr
Cement Silo Filling w/Fabric Filter	8.56E-09	9.81E-10	9.81E-10	1.99E-06	5.85E-08	1.59E-06	1.17E-08	8.04E-06	8.43E-08	0.00E+00	0.00E+00
Fly Ash Silo Filling w/Fabric Filter	3.00E-07	4.05E-11	5.94E-09	8.39E-05	3.66E-07	6.71E-05	7.32E-08	1.76E-05	6.84E-07	2.43E-04	4.98E-06
Central Mix Batching w/Fabric Filter	8.72E-06	0.00E+00	1.65E-09	1.00E-05	2.94E-07	8.02E-06	5.89E-08	2.98E-04	5.75E-07	9.48E-05	0.00E+00
Total Emissions	**9.03E-06**	**1.02E-09**	**8.57E-09**			**7.67E-05**	**1.44E-07**	**3.24E-04**	**1.34E-06**	**3.38E-04**	**4.98E-06**
EL (585 or 586)	1.50E-06	2.80E-05	0.0000037			0.033	5.60E-07	0.333	2.70E-05	0.007	0.013
Exceeds EL?	**Yes**	**No**	**No**			**No**	**No**	**No**	**No**	**No**	**No**

Model Input	**As lb/hr, 1-hr avg.**	**x1E06**	**Modeled for 280 cy/hr, 24 hr/day, Mar - Oct**
Cement Silo Filling w/Fabric Filter	2.91E-07	**0.291**	**10.491**
Fly Ash Silo Filling w/Fabric Filter	1.02E-05	**10.2**	
Central Mix Batching w/Fabric Filter	1.48E-06	**1.48**	**1.48**

DIESEL GENERATOR EMISSIONS

DEQ Permitting Notes are in Blue
DEQ Modeling Notes are in Red

Generator Set	hp	Hours of Operation	Emission Factors (g/hp-hr)(lb/hr)					Emissions											
								PM_{10}		NO_x		SO_2 at 0.5%		CO		VOC		Total HAPs	
			PM_{10}[3]	NO_x[3]	SO_2[2]	CO[3]	VOC[2]	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY
Generator Set	1,004	800	1.400E-02	5.530E+00	4.000E-03	1.400E-01	1.000E-02	0.031	0.012	12.240	4.896	4.016	1.606	0.310	0.124	10.040	4.016	0.012	0.005
Generator Set	126	800	1.900E-01	2.540E+00	2.050E-03	1.190E+00	2.470E-03	0.053	0.021	0.706	0.282	0.258	0.103	0.331	0.132	0.311	0.124	0.003	0.001
TOTAL	1,130							0.084	0.034	12.946	5.178	4.274	1.710	0.640	0.256	10.351	4.140	0.015	0.006

Notes: DEQ Note: JBR Analyses assume 0.5%S fuel. Federal law prohibits using diesel with a sulfur content greater than 0.05% in non-road engines (40 CFR 89.110.5a and 40 CFR 60 Subpart IIII)

AP-42 Table 3.4-1 SO2 EF…8.09E-03*0.05*1004 = 4.06E-01 lb/hr SO2 =

AP-42 emission factors for SO2 in Table 3.3-1 are presumed to be based on using 0.5% sulfur diesel. 126 hp * 2.05E-03 lb/hp-hr * (0.05%/0.5%) = 0.025 lb/hr SO2

0.431 lb/hr SO2 > 0.2 lb/hr, Modeling required

2 EPA AP-42 Tables 3.3-1 3.4-1 diesel industrial engine emission factors for engines less than and greater than 600 hp
3 EPA Tier 3 and manufacturer's emission factors for nonroad diesel engines

Max HR/YR, SW Idaho: 5,880

1.27 T/yr SO2 > 1 T/yr, Modeling required

HAPS

Generator Set	hp	Hours of Operation	Emission Factors lb/MMBtu[1]										
			HCHO	Benzene	Toluene	Xylenes	Propylene	Acetald.	Acrolein	PAH	POM	1,3 Butadiene	Naphthalene
Generator Set	1,004	800	7.890E-05	7.760E-04	2.810E-04	1.930E-04	2.790E-04	2.520E-05	7.880E-06	3.430E-06	3.520E-06		8.480E-05
Generator Set	126	800	1.180E-03	9.330E-04	4.090E-04	2.850E-04	0.000E+00	7.670E-04	9.250E-05	4.500E-06	3.570E-06	3.910E-05	1.300E-04
TOTAL	1,130												

1 AP-42, 5th Edition, Tables 3.3-1,2

EMISSION FACTOR ERRORS NOTED BY:
DEQ: AP-42 Table 3.4-4 (10/96) PAH 2.12E-04 lb/MMBtu (fuel input)
DEQ: AP-42 Table 3.3-2 (10/96) PAH 1.68E-04 lb/MMBtu (fuel input)
DEQ: AP-42 Table 3.4-4 (10/96) Propylene 2.79E-03 lb/MMBtu (fuel input)

Generator Set	hp	Hours of Operation	Emissions									
			HCHO		Benzene		Toluene		Xylenes		Propylene	
			lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY
Generator Set	1,004	800	5.545E-04	2.218E-04	5.454E-03	2.181E-03	1.975E-03	7.899E-04	1.356E-03	5.426E-04	1.961E-03	7.843E-04
Generator Set	126	800	1.041E-03	4.163E-04	8.229E-04	3.292E-04	3.607E-04	1.443E-04	2.514E-04	1.005E-04	0.000E+00	0.000E+00
TOTAL	1,130		1.595E-03	6.381E-04	6.277E-03	2.511E-03	2.336E-03	9.342E-04	1.608E-03	6.431E-04	1.961E-03	7.843E-04

DEQ VERIFICATION CALCS - USING APPLICANT's EFs

					lb/hr Ann Avg.							
Generator Set	1,104	800			4.981E-04							
Generator Set	126	800			7.515E-05							
Total					5.73E-04							
(lb/hr, annual avg.)					8.00E-04							
Exceeds EL?					No							

Generator Set	hp	Hours of Operation	Acetald.		Acrolein		PAH		POM		Total	
			lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY
Generator Set	1,004	800	1.771E-04	7.084E-05	5.538E-05	2.215E-05	2.411E-05	9.642E-06	2.474E-05	9.895E-06	1.158E-02	4.633E-03
Generator Set	126	800	6.765E-04	2.706E-04	8.159E-05	3.263E-05	3.969E-06	1.588E-06	3.149E-06	1.259E-06	3.275E-03	1.310E-03
TOTAL	1,130		8.536E-04	3.414E-04	1.370E-04	5.479E-05	2.808E-05	1.123E-05	2.789E-05	1.115E-05	1.486E-02	5.943E-03

DEQ VERIFICATION - APPLICANT EFs

			lb/hr Ann Avg.				lb/hr Ann Avg.		lb/hr Ann Avg.	
Generator Set	1,104	800	1.62E-05				2.20E-06		2.26E-06	
Generator Set	126	800	6.18E-05				3.62E-07		2.88E-07	
Total			7.80E-05				2.56E-06		2.55E-06	
(lb/hr, annual avg.)			3.00E-03				9.50E-05		2.00E-06	
Exceeds EL?			No				No		Yes	

DEQ VERIFICATION CALCULATIONS

1,3 Butadiene		Naphthalene	
lb/hr	TPY	lb/hr	TPY
0.00E+00	0.00E+00	5.96E-04	2.38E-04
3.45E-05	1.38E-05	1.15E-04	4.59E-05
3.449E-05	1.379E-05	7.106E-04	2.843E-04

lb/hr Ann Avg.	lb/hr Ann Avg.
0.00E+00	5.44E-05
3.15E-06	1.05E-05
3.15E-06	6.49E-05
2.40E-05	9.10E-05
No	No

FOR VALUES USED IN DEQ VERIFICATION ANALYSES, SEE DEQ Generator Input, DEG Gen G1 < 600 hp TAPs, DEQ Gen G2> 600 hp TAPs, and DEQ GEN TAPs

Facility: **WADSWORTH CBP - DECLO EXIT**
Permit/Facility ID: P-2010.0024

DEQ VERIFICATION

EPA AP-42 Tables 3.3-1 3.4-1 diesel industrial engine emission factors for engines less than and grea
EPA Tier 3 and manufacturer's emission factorsfor nonroad diesel engines

G1 Electrical Generator < 600 hp (447 kW) AP-42 Section 3.3 (diesel fueled)

Fuel Type Toggle =	1	**93.96 kW**
Fuel Consumption Rate	gal/hr	**126 bhp**
Calculated MMBtu/hr	0.882 MMBtu/hr	453.6 g/lb
Max Daily Operation	24 hr/day	7000 Btu/hp-hr, Avg brake-specific fuel consumption (BSFC)
Max Annual Operation	800 hrs/yr	

User Input Weight % Sulfur = 0.0500%
AP-42 3.3 SO2 EF = 0.29 for #2 fuel oil, presumed max 0.5%
SO2 emissions are multiplied by a factor: User Input Value/0.5% = 0.1000

	Pollutant	Emission Factor[a] **(g/hp-hr)** or (lb/hp-hr)	Emissions (lb/hr)	Emissions (T/yr)	TAPs Emissions (lb/hr) **Annual** or 24-hr Average
g/hp-hr	PM (total) [b]				
0.998	PM-10 (total) [b] MFR Info	**0.190**	5.28E-02		
	P.M.-2.5				
3.03	CO [b] MFR Info	**1.19**	3.31E-01		
14.06	NOxb MFR Info	**2.54**	7.06E-01		
	SO_2 [b] (total SOx as SO2)	2.05E-04	2.58E-02		
1.14	VOC [b] (total TOC--> VOCs) MFR	**2.47E-03**	6.86E-04		
	Lead				
	HCl [e]				
	Dioxins[e]	(lb/MMBtu)			
	2,3,7,8-TCDD				
	Total TCDD				
	1,2,3,7,8-PeCDD				
	Total PeCDD				
	1,2,3,4,7,8-HxCDD[c]				
	1,2,3,6,7,8-HxCDD				
	1,2,3,7,8,9-HxCDD[c]				
	Total HxCDD				
	1,2,3,4,6,7,8-Hp-CDD[c]				
	Total HpCDD[c]				
	Octa CDD[c]				
	Total PCDD[c]				
	Furans[e]				
	2,3,7,8-TCDF				
	Total TCDF[c]				
	1,2,3,7,8-PeCDF				
	2,3,4,7,8-PeCDF				
	Total PeCDF[c]				
	1,2,3,4,7,8-HxCDF				
	1,2,3,6,7,8-HxCDF				
	2,3,4,6,7,8-HxCDF				
	1,2,3,7,8,9-HxCDF				
	Total HxCDF[c]				
	1,2,3,4,6,7,8-HpCDF				
	1,2,3,4,7,8,9-HpCDF				
	Total HpCDF[c]				
	Octa CDF[c]				
	Total PCDF[c]				
	Total PCDD/PCDF[c]				
	Non-PAH HAPs				
	Acetaldehyde[c]	7.67E-04	6.76E-04	2.71E-04	**6.18E-05**
	Acrolein[c]	9.25E-05	8.16E-05	3.26E-05	8.16E-05
	Benzene[c,e]	9.33E-04	8.23E-04	3.29E-04	**7.52E-05**
	1,3-Butadiene[c,e]	3.91E-05	3.45E-05	1.38E-05	**3.15E-06**
	Ethylbenzene[e]				
	Formaldehyde[c,e]	1.18E-03	1.04E-03	4.16E-04	**9.50E-05**
	Hexane[e]				
	Isooctane				
	Methyl Ethyl Ketone[e]				
	Pentane[e]				
	Propionaldehyde[e]				
	Quinone[e]				
	Methyl chloroform[e]				
	Toluene[c,e]	4.09E-04	3.61E-04	1.44E-04	3.61E-04
	Xylene[c,e]	2.85E-04	2.51E-04	1.01E-04	2.51E-04
	POM (7-PAH Group)		3.03E-06		**2.77E-07**

Pollutant	Emission Factor[a] (lb/MMBtu)	Emissions (lb/hr)	Emissions (T/yr)	TAPs Emissions (lb/hr) **Annual** or 24-hr Average
PAH HAPs				
2-Methylnaphthalene				
3-Methylchloranthrene[e]				
Acenaphthene[c]	1.42E-06	1.25E-06	5.01E-07	**1.14E-07**
Acenaphthylene[c]	5.06E-06	4.46E-06	1.79E-06	**4.08E-07**
Anthracene[c]	1.87E-06	1.65E-06	6.60E-07	**1.51E-07**
Benzo(a)anthracene[c]	1.68E-06	1.48E-06	5.93E-07	**1.35E-07**
Benzo(a)pyrene[c,e]	1.88E-07	1.66E-07	6.63E-08	**1.51E-08**
Benzo(b)fluoranthene[c]	9.91E-08	8.74E-08	3.50E-08	**7.98E-09**
Benzo(e)pyrene				
Benzo(g,h,l)perylene[c]	4.89E-07	4.31E-07	1.73E-07	**3.94E-08**
Benzo(k)fluoranthene[c]	1.55E-07	1.37E-07	5.47E-08	**1.25E-08**
Chrysene[c]	3.53E-07	3.11E-07	1.25E-07	**2.84E-08**
Dibenzo(a,h)anthracene[c]	5.83E-07	5.14E-07	2.06E-07	**4.70E-08**
Dichlorobenzene				
Fluoranthene[c]	7.61E-06	6.71E-06	2.68E-06	**6.13E-07**
Fluorene[c]	2.92E-05	2.58E-05	1.03E-05	**2.35E-06**
Indeno(1,2,3-cd)pyrene[c]	3.75E-07	3.31E-07	1.32E-07	**3.02E-08**
Naphthalene[c,e]	8.48E-05	7.48E-05	2.99E-05	**6.83E-06**
Perylene				
Phenanthrene[c]	2.94E-05	2.59E-05	1.04E-05	**2.37E-06**
Pyrene[c]	4.78E-06	4.22E-06	1.69E-06	**3.85E-07**
Non-HAP Organic Compounds				
Acetone[e]				
Benzaldehyde				
Butane				
Butyraldehyde				
Crotonaldehyde[e]				
Ethylene				
Heptane				
Hexanal				
Isovaleraldehyde				
2-Methyl-1-pentene				
2-Methyl-2-butene				
3-Methylpentane				
1-Pentene				
n-Pentane				
Valeraldehyde				
Metals				
Antimony[e]				
Arsenic[e]				
Barium[e]				
Beryllium[e]				
Cadmium[e]				
Chromium[e]				
Cobalt[e]				
Copper[e]				
Hexavalent Chromium[e]				
Manganese[e]				
Mercury[e]				
Molybdenum[e]				
Nickel[e]				
Phosphorus[e]				
Silver[e]				
Selenium[e]				
Thallium[e]				
Vanadium[e]				
Zinc[e]				

a) Emission factors are from AP-42
b) AP-42, Table 3.3-1, Emission Factors for Uncontrolled Gasoline and Diesel Industrial Engines, 10/96
c) AP-42, Table 3.3-2, Speciated Organic Compoun Emission Factors for Uncontrolled Diesel Engine,Emission Factor Rating E, 10/96
d) (reserved)
e) IDAPA Toxic Air Pollutant

TAPs lb/hr rates are 24-hr averages except for those in bold text. Lb/hr rates for bold TAPs (carcinogens) are annual averages.

Facility: WADSWORTH CBP - DECLO EXIT — DEQ VERIFICATION

Permit/Facility ID: P-2010.0024

G2 Electrical Generator ENGINE > 600 hp (447 kW) AP-42 Section 3.4 (diesel fueled, uncontrolled)

Fuel Type Toggle =	1	749 kw	User Input Weight % Sulfur = 0.0500%
Fuel Consumption Rate	gal/hr	1,004 bhp	AP-42 3.4-1 SO2 EF = 8.09E-03 lb/hp-hr x S
Calculated MMBtu/hr	7.03 MMBtu/hr	453.6 g/lb	
Max Daily Operation	24 hr/day	7000 Btu/hp-hr, Avg brake-specific fuel consumption (BSFC)	
Max Annual Operation	800 hrs/yr		EPA Certified Generator (Tier 1, 2, 3, or Blue Sky)

	Pollutant	Emission Factor[a] (g/hp-hr) or (lb/hp-hr)	Emissions (lb/hr)	Emissions (T/yr)	TAPs Emissions (lb/hr) Annual or 24-hr Average
g/hp-hr	PM[b]				
0.998	PM-10 (total)[d] MFR Info	0.014	0.031		
	P.M.-2.5				
2.495	CO[b] MFR I	0.14	0.310		
10.886	NOxb MFR I	5.53	12.24		
	SO_2[b] (total SOx presumed SO2)	4.05E-04	0.406		
0.320	VOC[b] (total TOC--> VOCs) MFR	0.01	0.022		
	Lead				
	HCl[e]				
	Dioxins[e]	(lb/MMBtu)			
	2,3,7,8-TCDD				
	Total TCDD				
	1,2,3,7,8-PeCDD				
	Total PeCDD				
	1,2,3,4,7,8-HxCDD[c]				
	1,2,3,6,7,8-HxCDD				
	1,2,3,7,8,9-HxCDD[c]				
	Total HxCDD				
	1,2,3,4,6,7,8-Hp-CDD[c]				
	Total HpCDD[c]				
	Octa CDD[c]				
	Total PCDD[c]				
	Furans[e]				
	2,3,7,8-TCDF				
	Total TCDF[c]				
	1,2,3,7,8-PeCDF				
	2,3,4,7,8-PeCDF				
	Total PeCDF[c]				
	1,2,3,4,7,8-HxCDF				
	1,2,3,6,7,8-HxCDF				
	2,3,4,6,7,8-HxCDF				
	1,2,3,7,8,9-HxCDF				
	Total HxCDF[c]				
	1,2,3,4,6,7,8-HpCDF				
	1,2,3,4,7,8,9-HpCDF				
	Total HpCDF[c]				
	Octa CDF[c]				
	Total PCDF[c]				
	Total PCDD/PCDF[c]				
	Non-PAH HAPs				
	Acetaldehyde[e]	2.52E-05	1.77E-04	7.08E-05	1.62E-05
	Acrolein[c]	7.88E-06	5.54E-05	2.22E-05	5.54E-05
	Benzene[c,e]	7.76E-04	5.45E-03	2.18E-03	4.98E-04
	1,3-Butadiene[c,e]				
	Ethylbenzene[e]				
	Formaldehyde[c,e]	7.89E-05	5.55E-04	2.22E-04	5.06E-05
	Hexane[e]				
	Isooctane				
	Methyl Ethyl Ketone[e]				
	Pentane[e]				
	Propionaldehyde[e]				
	Quinone[e]				
	Methyl chloroform[e]				
	Toluene[c,e]	2.81E-04	1.97E-03	7.90E-04	1.97E-03
	Xylene[c,e]	1.93E-04	1.36E-03	5.43E-04	1.36E-03
	POM (7-PAH Group)		3.16E-05		2.89E-06

Pollutant	Emission Factor[a] (lb/MMBtu)	Emissions (lb/hr)	Emissions (T/yr)	TAPs Emissions (lb/hr) Annual or 24-hr Average
PAH HAPs				
2-Methylnaphthalene				
3-Methylchloranthrene[e]				
Acenaphthene[c1]	4.68E-06	3.29E-05	1.32E-05	**3.00E-06**
Acenaphthylene[c1]	9.23E-06	6.49E-05	2.59E-05	**5.92E-06**
Anthracene[c1]	1.23E-06	8.64E-06	3.46E-06	**7.89E-07**
Benzo(a)anthracene[c1]	6.22E-07	4.37E-06	1.75E-06	**3.99E-07**
Benzo(a)pyrene[c1,e]	2.57E-07	1.81E-06	7.22E-07	**1.65E-07**
Benzo(b)fluoranthene[c1]	1.11E-06	7.80E-06	3.12E-06	**7.12E-07**
Benzo(e)pyrene				
Benzo(g,h,i)perylene[c1]	5.56E-07	3.91E-06	1.56E-06	**3.57E-07**
Benzo(k)fluoranthene[c1]	2.18E-07	1.53E-06	6.13E-07	**1.40E-07**
Chrysene[c1]	1.53E-06	1.08E-05	4.30E-06	**9.82E-07**
Dibenzo(a,h)anthracene[c1]	3.46E-07	2.43E-06	9.73E-07	**2.22E-07**
Dichlorobenzene				
Fluoranthene[c1]	4.03E-06	2.83E-05	1.13E-05	**2.59E-06**
Fluorene[c1]	1.28E-05	9.00E-05	3.60E-05	**8.22E-06**
Indeno(1,2,3-cd)pyrene[c1]	4.14E-07	2.91E-06	1.16E-06	**2.66E-07**
Naphthalene[c1,e]	1.30E-04	9.14E-04	3.65E-04	**8.34E-05**
Perylene				
Phenanthrene[c1]	4.08E-05	2.87E-04	1.15E-04	**2.62E-05**
Pyrene[c1]	3.71E-06	2.61E-05	1.04E-05	**2.38E-06**
Non-HAP Organic Compounds				
Acetone[e]				
Benzaldehyde				
Butane				
Butyraldehyde				
Crotonaldehyde[e]				
Ethylene				
Heptane				
Hexanal				
Isovaleraldehyde				
2-Methyl-1-pentene				
2-Methyl-2-butene				
3-Methylpentane				
1-Pentene				
n-Pentane				
Valeraldehyde				
Metals				
Antimony[e]				
Arsenic[e]				
Barium[e]				
Beryllium[e]				
Cadmium[e]				
Chromium[e]				
Cobalt[e]				
Copper[e]				
Hexavalent Chromium[e]				
Manganese[e]				
Mercury[e]				
Molybdenum[e]				
Nickel[e]				
Phosphorus[e]				
Silver[e]				
Selenium[e]				
Thallium[e]				
Vanadium[e]				
Zinc[e]				

a) Emission factors are from AP-42
b) AP-42, Table 3.4-1, Gaseous Emission Factors for Large Stationary Diesel and All Stationary Dual Fuel Engines, 10/96
c) AP-42, Table 3.4-3, Speciated Organic Compound Emission Factors for Large Uncontrolled Stationary Diesel Engines, Emission Factor Rating E, 10/96
c1) AP-42, Table 3.4-4, PAH Emission Factors for Large Uncontrolled Stationary Diesel Engines, Emission Factor Rating E, 10/96
d) AP-42, Table 3.4-2, Particulate and Particle-Sizing Emission Factors for Large Uncontrolled Stationary Diesel Engines, Emission Factor Rating E, 10/96
e) IDAPA Toxic Air Pollutant

TAPs lb/hr rates are 24-hr averages except for those in bold text. Lb/hr rates for bold TAPs (carcinogens) are annual averages

Facility: WADSWORTH CBP - DECLO EXIT

Permit/Facility ID: P-2010.0024

TAPs EL Screen - ALL SOURCES

586 pollutants are shown in bold

C1. Generator G1: 6.44 gal/hour 800 Hours/year — Generator <600hp — #2 Fuel Oil — 24 hrs/day

C2. Generator G2: 51.29 gal/hour 800 Hours/year — Generator > 600hp — #2 Fuel Oil — 24 hrs/day

Pollutant	TOTAL of Max Emission Rates from A, B, C & D (lb/hr)	TAPs Screening Emission Limit (EL) Increment[b] (lb/hr)	TAPs Emissions Exceed EL Increment?	Modeled? Meets AAC or AACC?
HCl[e]	0.000	0.05	No	
Dioxins		**Toxic Equivalency Factor[c]**	**Adjusted Emission Rate (lb/hr)**	
2,3,7,8-TCDD	0.000	1.0	0.00E+00	
Total TCDD	0.000	n/a		
1,2,3,7,8-PeCDD	0.000	1.0	0.00E+00	
Total PeCDD	0.000	n/a		
1,2,3,4,7,8-HxCDD	0.000	0.1	0.00E+00	
1,2,3,6,7,8-HxCDD	0.000	0.1	0.00E+00	
1,2,3,7,8,9-HxCDD	0.000	0.1	0.00E+00	
Total HxCDD	0.000	n/a		
1,2,3,4,6,7,8-Hp-CDD	0.000	0.01	0.00E+00	
Total HpCDD	0.000	n/a		
Octa CDD	0.000	0.0003	0.00E+00	
Total PCDD	0.000	n/a		
Furans				
2,3,7,8-TCDF	0.000	0.1	0.00E+00	
Total TCDF	0.000	n/a		
1,2,3,7,8-PeCDF	0.000	0.03	0.00E+00	
2,3,4,7,8-PeCDF	0.000	0.3	0.00E+00	
Total PeCDF	0.000	n/a		
1,2,3,4,7,8-HxCDF	0.000	0.1	0.00E+00	
1,2,3,6,7,8-HxCDF	0.000	0.1	0.00E+00	
2,3,4,6,7,8-HxCDF	0.000	0.1	0.00E+00	
1,2,3,7,8,9-HxCDF	0.000	0.1	0.00E+00	
Total HxCDF	0.000	n/a		
1,2,3,4,6,7,8-HpCDF	0.000	0.01	0.00E+00	
1,2,3,4,7,8,9-HpCDF	0.000	0.01	0.00E+00	
Total HpCDF	0.000	n/a		
Octa CDF	0.000	0.0003	0.00E+00	
Total PCDF	0.000	n/a		
Total PCDD/PCDF	0.000	n/a		
TOTAL	Adjusted lb/hr	TAPs EL for 2,3,7,8 TCDD	**Exceeds TAPs EL?**	**Modeled?**
Dioxin/Furans[c]	0.00E+00	0.00E+00	No	
Non-PAH HAPs				
Acetaldehyde	7.80E-05	3.00E-03	No	
Acrolein	1.37E-04	0.017	No	
Benzene	5.73E-04	8.00E-04	**No**	
1,3-Butadiene	3.15E-06			
Ethylbenzene	0.00E+00	29	No	
Formaldehyde	1.46E-04	5.10E-04	**No**	
Hexane	0.00E+00	12	No	
Isooctane	0.00E+00			
Methyl Ethyl Ketone	0.00E+00	39.3	No	
Pentane	0.00E+00	118	No	
Propionaldehyde	0.00E+00	0.0287	No	
Quinone	0.00E+00	0.027	No	
Methyl chloroform	0.00E+00	127	No	
Toluene	2.34E-03	25	No	
Xylene	1.61E-03	29	No	

Pollutant	TOTAL of Max Emission Rates from A, B, C & D (lb/hr)	TAPs Screening Emission Limit (EL) Increment[b] (lb/hr)	TAPs Emissions Exceed EL Increment?	Modeled? Meets AAC or AACC?
PAH HAPs				
2-Methylnaphthalene	0.00E+00	9.10E-05	No	
3-Methylchloranthrene	0.00E+00	2.50E-06	No	
Acenaphthene	3.12E-06	9.10E-05	No	
Acenaphthylene	6.33E-06	9.10E-05	No	
Anthracene	9.40E-07	9.10E-05	No	
Benzo(a)anthracene	5.35E-07			see POM
Benzo(a)pyrene	1.80E-07	2.00E-06	No	see POM
Benzo(b)fluoranthene	7.20E-07			see POM
Benzo(e)pyrene	0.00E+00	9.10E-05	No	
Benzo(g,h,I)perylene	3.96E-07	9.10E-05	No	
Benzo(k)fluoranthene	1.52E-07			see POM
Chrysene	1.01E-06			see POM
Dibenzo(a,h)anthracene	2.69E-07			see POM
Dichlorobenzene	0.00E+00	9.10E-05	No	
Fluoranthene	3.20E-06	9.10E-05	No	
Fluorene	1.06E-05	9.10E-05	No	
Indeno(1,2,3-cd)pyrene	2.96E-07			see POM
Naphthalene[e]	9.03E-05	9.10E-05	No	
Perylene	0.00E+00	9.10E-05	No	
Phenanthrene	2.86E-05	9.10E-05	No	
Pyrene	2.77E-06	9.10E-05	No	
PolycyclicOrganicMatter[d]	3.16E-06	2.00E-06	**Exceeds**	**Yes**
Non-HAP Organic Compounds				
Acetone	0.00E+00	119	No	
Benzaldehyde	0.00E+00			
Butane	0.00E+00			
Butyraldehyde	0.00E+00			
Crotonaldehyde	0.00E+00	0.38	No	
Ethylene	0.00E+00			
Heptane	0.00E+00	109	No	
Hexanal	0.00E+00			
Isovaleraldehyde	0.00E+00			
2-Methyl-1-pentene	0.00E+00			
2-Methyl-2-butene	0.00E+00			
3-Methylpentane	0.00E+00			
1-Pentene	0.00E+00			
n-Pentane[e]	0.00E+00	118	No	
Valeraldehyde (n-Valeraldehyde)	0.00E+00	11.7	No	
Metals				
Antimony[e]	0.00E+00	0.033	No	
Arsenic	0.00E+00	1.50E-06	No	
Barium	0.00E+00	0.033	No	
Beryllium	0.00E+00	2.80E-05	No	
Cadmium	0.00E+00	3.70E-06	No	
Chromium	0.00E+00	0.033	No	
Cobalt	0.00E+00	0.0033	No	
Copper	0.00E+00	0.013	No	
Hexavalent Chromium	0.00E+00	5.60E-07	No	
Manganese	0.00E+00	0.067	No	
Mercury	0.00E+00	0.003	No	
Molybdenum	0.00E+00	0.333	No	
Nickel	0.00E+00	2.70E-05	No	
Phosphorus	0.00E+00	0.007	No	
Silver	0.00E+00	0.007	No	
Selenium	0.00E+00	0.013	No	
Thallium	0.00E+00	0.007	No	
Vanadium	0.00E+00	0.003	No	
Zinc	0.00E+00	0.667	No	

a) Reserved.

b) Toxic Air Pollutants, IDAPA 58.01.01.585 and .586, levels in effect as of February 25, 2009

c) 2005, Van den Berg, et al, The 2005 World Health Organization Reevaluation of Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-Like Compounds, *Toxicological Sciences* 93(2), 223-241 (2006). Accessible at http://toxsci.oxfordjournals.org/cgi/reprint/93/2/223.
Use of the 2005 WHO toxic equivalency factors (TEFs) is consistent with current EPA recommendations for TRI reporting (72 FR 26544, May 10, 2007)
n/a = not available. IDAPA 58.01.01.586, TAPs Carcinogenic Increments: Total of adjusted emission rates are treated as a single TAP (2,3,7,8 TCDD)

d) IDAPA 58.01.01.586, Polycyclic Organic Matter: Emissions of highlighted PAHs h shall be considered together as one TAP equivalent in potency to benzo(a)pyrene.

e) Naphthalene is listed as a noncarcinogenic TAP in IDAPA 58.01.01.585 (EL = 3.33 lb/hr), but must also be considered as a carcinogenic PAH (EL = 9.10E-05 lb/hr)

TAPs lb/hr rates are 24-hr averages except for those in bold text. Lb/hr rates for bold TAPs (carcinogens) are annual averages.

APPENDIX B – PERMIT FEES

PTC Fee Calculation

Instructions:
Fill in the following information and answer the following questions with a Y or N. Enter the emissions increases and decreases for each pollutant in the table.

Company:	**Ralph L. Wadsworth Construction**
Address:	**166 E. 14000 S. Suite 200**
City:	**Draper**
State:	**Utah**
Zip Code:	**84020**
Facility Contact:	**Tim Parsons**
Title:	**Plant Operator**
AIRS No.:	**777-00482**

N	Does this facility qualify for a general permit (i.e. concrete batch plant, hot-mix asphalt plant)? Y/N
Y	Did this permit require engineering analysis? Y/N
N	Is this a PSD permit Y/N (IDAPA 58.01.01.205.04)

Emissions Inventory			
Pollutant	Annual Emissions Increase (T/yr)	Annual Emissions Reduction (T/yr)	Annual Emissions Change (T/yr)
NO_X	5.2	0	5.2
SO_2	1.7	0	1.7
CO	0.3	0	0.3
PM10	0.3	0	0.3
VOC	4.1	0	4.1
TAPS/HAPS	0.0	0	0.0
Total:	0.0	0	**11.5**
Fee Due	**$ 5,000.00**		

Comments: The processing fee of $5000 is in accordance to IDAPA 58.01.01.225 because the increase in total criteria pollutant emissions is between 10 and 100 T/yr.

APPENDIX C – AMBIENT AIR QUALITY ANALYSIS – DECLO

MEMORANDUM

DATE: March 16, 2010

TO: Eric Clark, EIT., Permit Engineer, Air Quality Division

FROM: Cheryl Robinson, P.E., Air Quality Engineer/Modeling Analyst, Air Quality Division

PROJECT NUMBER: P-2010.0024

SUBJECT: Facility ID No. 777-00482, Modeling Review for Ralph L. Wadsworth Construction Initial PTC for a Portable Concrete Batch Plant Located at the I-84 Declo Interchange

1.0 Summary

Ralph L. Wadsworth Construction (Wadsworth) submitted a Permit to Construct (PTC) application for an initial permit for a portable concrete batch plant (CBP). JBR Environmental, Inc., of Sandy, Utah, and Boise, Idaho, prepared the application on Wadsworth's behalf. The application requests approval to operate at an initial location at the Declo interchange on I-84 North (Exit 216, intersection with State Highway 25) northeast of Burley, Idaho, and to operate as a portable source at other unspecified locations within Idaho.

Air quality analyses involving atmospheric dispersion modeling of emissions associated with the facility were performed to demonstrate the facility would not cause or significantly contribute to a violation of any ambient air quality standard (IDAPA 58.01.01.203.02 [Idaho Air Rules Section 203.02]) or Toxic Air Pollutant (TAP) increment (Idaho Air Rules Section 203.03). JBR conducted site-specific modeling for the initial location. The parcel is owned by the Idaho Transportation Department (ITD), and the initial permit is needed to bring this CBP into Idaho to supply concrete for a specific ITD paving project.

A technical review of the submitted analyses was conducted by DEQ. The submitted analyses, combined with DEQ's verification analyses: 1) utilized appropriate methods and models; 2) were conducted using reasonably accurate or conservative model parameters and input data; 3) adhered to established DEQ guidelines for new source review dispersion modeling; 4) showed either a) that predicted pollutant concentrations from emissions associated with the facility were below significant contribution levels (SCLs) or other applicable regulatory thresholds; or b) that predicted pollutant concentrations from emissions associated with the facility, when appropriately combined with background concentrations, were below applicable air quality standards at all locations outside of the facility's property boundary. Key assumptions used in the modeling analyses and the impact of these assumptions on the compliance demonstration are shown in Table 1. Compliance has been demonstrated <u>only</u> if the facility is operated in accordance with these assumptions.

Table 1. KEY ASSUMPTIONS USED IN MODELING ANALYSES

Criteria/Assumption/Result	Explanation/Consideration
Crushing and concrete production do not occur at the I-84 Declo Exit from November through February.	A review of 10 years of climate data for Boise showed that temperatures were usually consistently below freezing from November through February (see last page of modeling memo).
Operations: Concrete Production is limited to maximum 3,360 cy/day	<u>Submitted analyses</u>: 24-hour PM_{10} compliance was demonstrated for: 220 x 12 = 2,640 cy/day, during the day, 6 a.m. – 6 p.m. <u>DEQ verification modeling</u>: "Nighttime Operations," 9 p.m. – 9 a.m. 280 cy/hr x 12 hr/day = 3,360 cy/day

Table 1. KEY ASSUMPTIONS USED IN MODELING ANALYSES	
Criteria/Assumption/Result	**Explanation/Consideration**
Operations: Concrete Production is limited to maximum 72,000 cy/yr.	Preconstruction compliance with state toxic air pollutant (TAP) rules was demonstrated using controlled emissions of carcinogenic TAP emissions) contained in cement and flyash, based on a maximum production of 72,000 cy/yr of concrete at the Declo Exit site.
Operations: Generator engines used at the Declo Exit site are limited to: - Total of 1,130 bhp for all engined, combined. - Burning ASTM #1 and/or #2 diesel fuel containing a maximum of 0.05% sulfur by weight.	DEQ's verification analyses presumed: - The two proposed generators operated 24 hr/day for every day from March 1 through October 31. - Exhaust temperatures no higher than 700 °F and exit velocities no greater than 25 m/sec. - Manufacturer's emission estimates in g/hp-hr of CO, PM_{10}, and NO_2 would continue to be met.

2.0 Background Information

2.1 Applicable Air Quality Impact Limits and Modeling Requirements

This section identifies applicable ambient air quality limits and analyses used to demonstrate compliance for this portable facility when located at the Declo Interchange on Interstate-84, northeast of Burley, Idaho. Approximate UTM coordinates for this facility location are 284.9 m Easting and 4,716.6 m Northing, in UTM Zone 12.

2.1.1 Area Classification

The initial facility location at the Declo Interchange is within Minidoka County which is designated as an attainment or unclassifiable area for carbon monoxide (CO), lead (Pb), nitrogen dioxide (NO_2), ozone, particulate matter with an aerodynamic diameter less than or equal to 10 micrometers (PM_{10}) and 2.5 micrometers ($PM_{2.5}$), and sulfur oxides (SO_x). There are no Class I areas within 10 kilometers of this location.

2.1.2 Significant and Cumulative NAAQS Impact Analyses

If estimated maximum pollutant impacts to ambient air from the emissions sources associated with the existing unpermitted facility exceed the significant contribution levels (SCLs) of Section 006.102 of IDAPA 58.01.01, Rules for the Control of Air Pollution in Idaho (Idaho Air Rules), then a cumulative impact analysis is necessary to demonstrate compliance with National Ambient Air Quality Standards (NAAQS) and Idaho Air Rules Section 203.02. A cumulative NAAQS impact analysis for attainment area pollutants involves adding ambient impacts from facility-wide emissions, and emissions from any nearby co-contributing sources, to DEQ-approved background concentration values that are appropriate for the criteria pollutant/averaging-time at the facility location and the area of significant impact. The resulting maximum pollutant concentrations in ambient air are then compared to the NAAQS listed in Table 2. The SCLs and the modeled value that must be used for comparison to the NAAQS are also listed in Table 2.

Table 2. APPLICABLE REGULATORY LIMITS				
Pollutant	**Averaging Period**	**Significant Contribution Levels[a] ($\mu g/m^3$)[b]**	**Regulatory Limit[c] ($\mu g/m^3$)**	**Modeled Value Used[d]**
PM_{10}[e]	Annual[f]	1.0	50[g]	Maximum 1[st] highest[h]
	24-hour	5.0	150[i]	Maximum 6[th] highest[j]
$PM_{2.5}$[k]	Annual	Not established	15	Use PM_{10} as surrogate
	24-hour	Not established	35	Use PM_{10} as surrogate

Table 2. APPLICABLE REGULATORY LIMITS

Pollutant	Averaging Period	Significant Contribution Levels[a] ($\mu g/m^3$)[b]	Regulatory Limit[c] ($\mu g/m^3$)	Modeled Value Used[d]
Carbon monoxide (CO)	8-hour	500	10,000[l]	Maximum 2nd highest[h]
	1-hour	2,000	40,000[l]	Maximum 2nd highest[h]
Sulfur Dioxides (SO_x)	Annual	1.0	80[g]	Maximum 1st highest[h]
	24-hour	5	365[l]	Maximum 2nd highest[h]
	3-hour	25	1,300[l]	Maximum 2nd highest[h]
Nitrogen Dioxide (NO_2)	Annual	1.0	100[g]	Maximum 1st highest[h]
Lead (Pb)	Quarterly	NA	0.15[i]	Maximum 1st highest[h]

[a] Idaho Air Rules Section 006.102
[b] Micrograms per cubic meter
[c] Idaho Air Rules Section 577 for criteria pollutants
[d] The maximum 1st highest modeled value is always used for significant impact analysis
[e] Particulate matter with an aerodynamic diameter less than or equal to a nominal ten micrometers
[f] The annual PM_{10} standard was revoked in 2006. The standard is still listed because compliance with the annual $PM_{2.5}$ standard is demonstrated by a PM_{10} analysis that demonstrates compliance with the revoked PM_{10} standard.
[g] Never expected to be exceeded in any calendar year
[h] Concentration at any modeled receptor
[i] Never expected to be exceeded more than once in any calendar year
[j] Concentration at any modeled receptor when using five years of meteorological data
[k] Particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers
[l] Not to be exceeded more than once per year

New source review requirements for assuring compliance with $PM_{2.5}$ standards have not yet been completed and promulgated into regulation. EPA has asserted through a policy memorandum that compliance with $PM_{2.5}$ standards will be assured through an air quality analysis for the corresponding PM_{10} standard. Although the PM_{10} annual standard was revoked in 2006, compliance with the revoked PM_{10} annual standard must be demonstrated as a surrogate to the annual $PM_{2.5}$ standard.

2.1.3 Toxic Air Pollutant Analyses

Emissions of toxic substances are generally addressed by Idaho Air Rules Section 161:

> *Any contaminant which is by its nature toxic to human or animal life or vegetation shall not be emitted in such quantities or concentrations as to alone, or in combination with other contaminants, injure or unreasonably affect human or animal life or vegetation.*

Permit requirements for toxic air pollutants (TAPs) from new or modified sources are specifically addressed by Idaho Air Rules Section 203.03 and require the applicant to demonstrate to the satisfaction of DEQ the following:

> *Using the methods provided in Section 210, the emissions of toxic air pollutants from the stationary source or modification would not injure or unreasonably affect human or animal life or vegetation as required by Section 161. Compliance with all applicable toxic air pollutant carcinogenic increments and toxic air pollutant non-carcinogenic increments will also demonstrate preconstruction compliance with Section 161 with regards to the pollutants listed in Sections 585 and 586.*

Per Section 210, if the emissions increase associated with a new source or modification exceeds screening emission levels (ELs) of Idaho Air Rules Section 585 or 586, then the ambient impact of the emissions increase must be estimated. If ambient impacts are less than applicable Acceptable Ambient Concentrations (AACs) for non-carcinogens of Idaho Air Rules Section 585 and Acceptable Ambient Concentrations for Carcinogens (AACCs) of Idaho Air Rules Section 586, then compliance with TAP requirements has been demonstrated.

2.2 Background Concentrations

Background concentrations must be added to modeling results if maximum modeled concentrations exceed significant contribution levels. Background concentrations are used in the cumulative NAAQS impact analyses to account for impacts from sources not explicitly modeled.

Background concentrations were revised for all areas of Idaho by DEQ in March 2003[1]. Background concentrations in areas where no monitoring data are available were based on monitoring data from areas with similar population density, meteorology, and emissions sources. For this facility's initial location in a construction area at the I-84 Declo Exit (the intersection with State Highway 25 near Burley), DEQ recommends using default rural/agricultural background concentrations for all criteria pollutants. Short-term PM_{10} data collected at the courthouse in nearby Rupert was not recommended based on the potential construction activity expected near the CBP location. The recommended values are shown in Table 3.

Table 3. BACKGROUND CONCENTRATIONS

Pollutant	Averaging Period	Background Concentration ($\mu g/m^3$)[a]
PM_{10}[b]	24-hour	73
	Annual	26
Carbon monoxide (CO)	1-hour	3,600
	8-hour	2,300
Sulfur dioxide (SO_2)	3-hour	34
	24-hour	26
	Annual	8
Nitrogen dioxide (NO_2)	Annual	17
Lead (Pb)	Quarterly	0.03

a. Micrograms per cubic meter.

b. Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers.

3.0 Modeling Impact Assessment

3.1 Modeling Methodology

This section describes the modeling methods used by the applicant to demonstrate compliance with applicable air quality standards.

3.1.1 Overview of Analyses

The modeling output files indicate that JBR used BEE-Line Software's BEEST for Windows, version 9.76, and that the license for this software is expired. It is the applicant's responsibility to comply with applicable software licensing requirements.

BEEST v. 9.76 was issued on December 6, 2008. BEEST v. 9.81e was issued November 17, 2009, so was readily available for these project analyses conducted in early February 2010. Modeling analyses conducted in support of air quality permits should use the latest versions of AERMOD and its associated preprocessing programs. DEQ's verification analyses used the current versions of the EPA-approved

[1] Hardy, Rick and Schilling, Kevin. *Background Concentrations for Use in New Source Review Dispersion Modeling*. Memorandum to Mary Anderson, March 14, 2003.

software. A comparison of the program versions used by JBR and those available at the time that JBR conducted this analysis is shown in Table 3.3a.

Table 3.3a VERSIONS OF EPA-APPROVED MODELING SOFTWARE IN BEEST		
Program	**BEEST 9.76**	**BEEST 9.81e**
AERMET	v. 06341	v. 06341
AERMAP	v. 06341	v. 09040
AERMOD	v. 07026	v. 09292
BPIP-PRIME	v. 04274	v.04274

A brief description of parameters used in the modeling analyses is provided in Table 4.

Table 4. MODELING PARAMETERS		
Parameter	**Description/Values**	**Documentation/Addition Description[a]**
Model	AERMOD	AERMOD with the PRIME downwash algorithm, version 07026. DEQ's verification analyses used the current version, AERMOD 09292, with the PRIME downwash algorithm.
Meteorological data	Years: 2000-2004 Surface: Minidoka/Paul Upper Air: Boise	Surface data were collected by the Department of Energy's Idaho National Laboratory from a monitor located near Minidoka, with National Weather Service upper air data from the Boise airport. The data were processed through AERMET (version 06341) by Geomatrix (now Environ) in May 2008. NWS surface data from the Burley Airport (Surface Station 25867) were used to fill data gaps. The processed met data set was provided to JBR by DEQ.
Terrain	Considered	JBR used AERMAP (version 06341) to extract building, emission source, and receptor elevations and determine the controlling hill height elevation from USGS 7.5' digital elevation model (DEM) (30-meter resolution) files. UTM coordinates were reported to be based on datum NAD27. DEQ's verification analyses used AERMAP version 09040 to extract data from a 1-arc second NED tiff file (~30 m resolution) for the same area in datum NAD83. Default rural dispersion was used in the submitted analyses and in DEQ's verification analyses.
Building downwash	Considered	Building downwash parameters were calculated using the BPIP PRIME algorithm (version 04274).
Receptor Grid	Receptors	Receptor locations were reported to be defined in UTM coordinates (NAD27).
	Fenceline Grid	25-meter spacing along the property boundary.
	Grid 1	50-meter spacing in a rectangular grid out to 100 meters.
	Grid 2	100-meter spacing in a rectangular grid between 100 meters and 500 meters.
	Grid 3	500-meter spacing in a rectangular grid between 500 meters and 1,000 meters (1 km).
	Grid 4	1000-meter spacing in a rectangular grid between 1 km and 5 km.

3.1.2 Modeling Protocol and Methodology

A modeling protocol submitted to DEQ by JBR on January 27, 2010 was approved with comment by DEQ on January 27, 2010. Modeling was generally conducted using data described in the protocol and methods described in the *State of Idaho Air Quality Modeling Guideline*. Modeling for criteria pollutants was required for PM_{10} (24-hour and annual), NO_2 (annual), and SO_2 (3-hr, 24-hr, and annual).

Modeling for CO impacts was not required. Emissions of CO were estimated to be 0.33 lb/hr from the small generator and 0.31 lb/hr from the large generator. Combined CO emissions of 0.64 lb/hr were significantly less than DEQ's modeling threshold of 14 lb/hr.

See DEQ's emission inventory in Appendix A of the statement of basis for a comparison of toxic air pollutant (TAP) emissions and the applicable screening emission level (EL). Modeling for TAPs impacts was limited to criteria pollutatnts was required arsenic (annual), and POM (7-PAH group, annual).

3.1.3 Model Selection

Idaho Air Rules Section 202.02 requires that estimates of ambient concentrations be based on air quality models specified in 40 CFR 51, Appendix W (Guideline on Air Quality Models). The refined, steady state, multiple source, Gaussian dispersion model AERMOD was promulgated as the replacement model for ISCST3 in December 2005. EPA provided a one-year transition period during which either ISCST3 or AERMOD could be used at the discretion of the permitting agency. AERMOD must be used for all air impact analyses, performed in support of air quality permitting, conducted after November 2006.

AERMOD retains the single straight line trajectory of ISCST3, but includes more advanced algorithms to assess turbulent mixing processes in the planetary boundary layer for both convective and stable stratified layers.

AERMOD offers the following improvements over ISCST3:

- Improved dispersion in the convective boundary layer and the stable boundary layer.
- Improved plume rise and buoyancy calculations.
- Improved treatment of terrain affects on dispersion.
- New vertical profiles of wind, turbulence, and temperature.

AERMOD was used for the submitted analyses for this project.

3.1.4 Meteorological Data

The Declo Interchange site is located about 15.4 miles south of the meteorological tower operated in Minidoka by the Idaho National Laboratory (INL), and about 8.3 miles east-northeast of the National Weather Service (NWS) station at the Burley airport. NWS data from Burley were used to fill missing hours of data from the Minidoka station. Surface characteristics within one kilometer surrounding the Declo Interchange are quite similar to the area surrounding the INL met tower and the Burley Airport, i.e., predominantly agricultural lands. DEQ determined that the Minidoka/Burley surface data and upper air meteorological data collected at the Boise airport from 2000 through 2004 were the best representative data available at this time. These meteorological data were previously processed through AERMET—the meteorological data preprocessor for AERMOD—by Geomatrix (now Environ) using AERMET version 06341. Surface characteristics were analyzed manually (AERSURFACE had not yet been issued).

3.1.5 Terrain Effects

Terrain effects on dispersion were considered in these site-specific analyses. JBR used AERMAP (version 06341) to extract building, emission source, and receptor elevations and determine the controlling hill height elevation from the following nine USGS 7.5-minute digital elevation model (DEM) files, which have a resolution of about 30-meters, with UTM coordinates based on the NAD 27 datum: ACEQUIA, ALBION, IDAHOME, VIEW, LAKE WALCOTT SW, LAKE WALCOTT WEST, RUPERT, RUPERT SE, and RUPERT NW.

The domain included the area between 42.375 and 42.75 degrees north latitude and -113.375 to -113.75 degrees longitude, expressed in UTM datum NAD83. Elevations used in DEQ's verification analyses were extracted from a National Elevation Database (NED) 1-arc-second tiff file for the same domain. The domain used for the modeling analyses is shown in Figure 3-1. The rural characteristics of the area near the facility are shown in Figure 3-2 (Figure 2 in the submitted application).

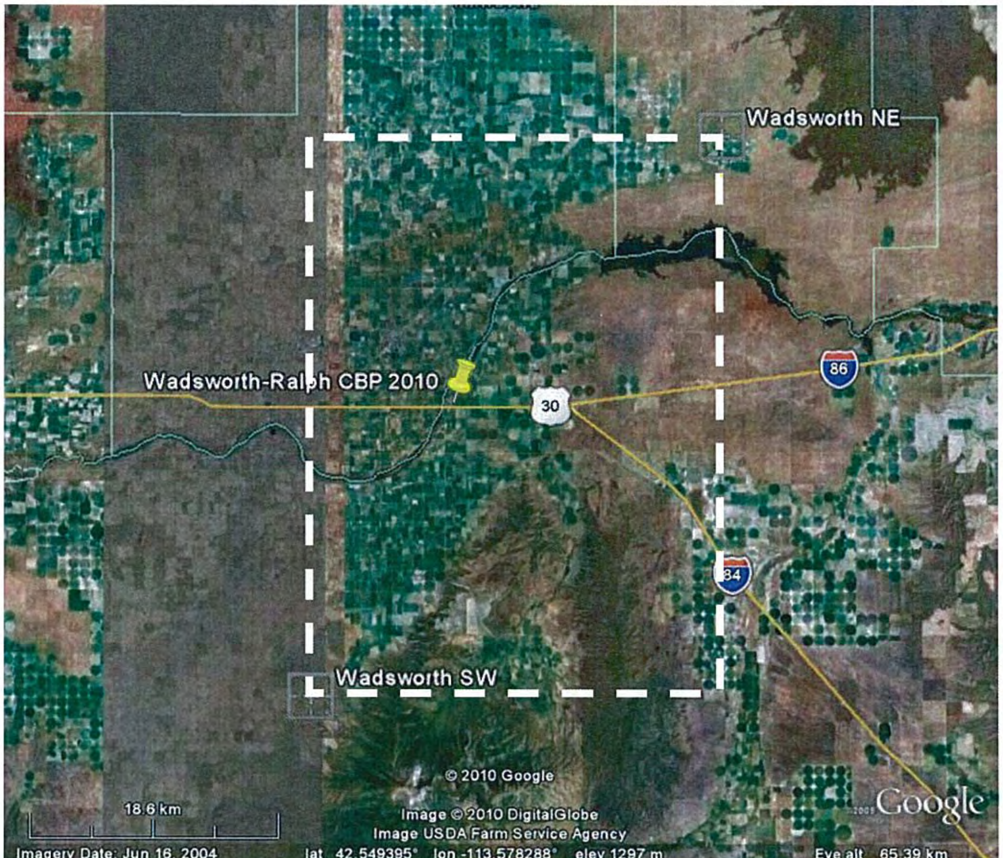

Figure 3-1. WADSWORTH I-84 DECLO EXIT SITE MODELING DOMAIN

Figure 3-2. WADSWORTH I-84 DECLO EXIT SITE AND SURROUNDING AREA

3.1.6 Facility Layout

The facility layout used in the submitted and verification modeling analyses is shown in Figure 3-3.

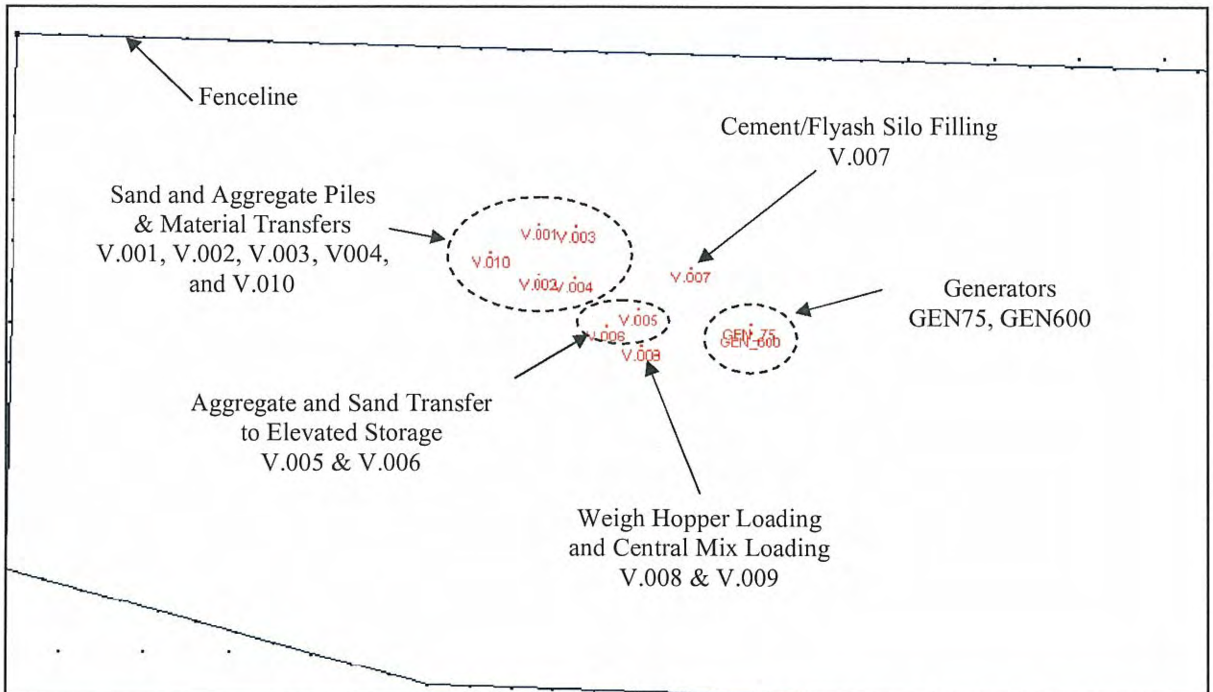

Figure 3-3. WADSWORTH I-84 DECLO EXIT SITE CBP FACILITY LAYOUT

3.1.7 Building Downwash

Plume downwash effects caused by existing or temporary structures present at the facility or the freeway overpass to the southeast were not accounted for in the submitted modeling analyses. The highest point of the overpass is located about 335 meters to the southwest of the estimated concrete batch plant location. Its "porous" design that allows air to pass easily under and over the structure would not be expected to produce downwash that would affect the batch plant emissions. A small building appears to be located near the western end of the project site, about 150 to 170 meters from the anticipated batch plant location. Downwash from this building or from temporary construction trailer(s) that might provide office space for Wadsworth staff during concrete batch plant operations would not be expected to produce downwash that would substantially affect dispersion of the plant's emissions.

3.1.8 Ambient Air Boundary

Ambient air is defined in Section 006 of the Idaho Air Rules as "that portion of the atmosphere, external to buildings, to which the general public has access." For area sources, the ambient air boundary is typically defined as the property boundary. The property boundary shown in Figure 3-2 was used as the ambient air boundary for the dispersion modeling. In the application, the property was described as being owned by the Idaho Transportation Department and currently in use as a maintenance yard. The property is described as fenced and posted. During the period when this concrete batch plant is operated, however, the property will be used solely by the Wadsworth plant and personnel. fenced on the west, north, and parts of the east and south boundary. In accordance with DEQ modeling guidelines, the fence described as surrounding this property should be sufficient to prevent unauthorized access by the general public. This fenceline defined the ambient air boundary for this project.

3.1.9 Receptor Network

The receptor grids used for the submitted modeling analyses are summarized in Table 4. The near-field receptor grid and source locations are illustrated in Figure 3-4, which was obtained from the electronic copies of the modeling files using Oris Solutions' BEEST program.

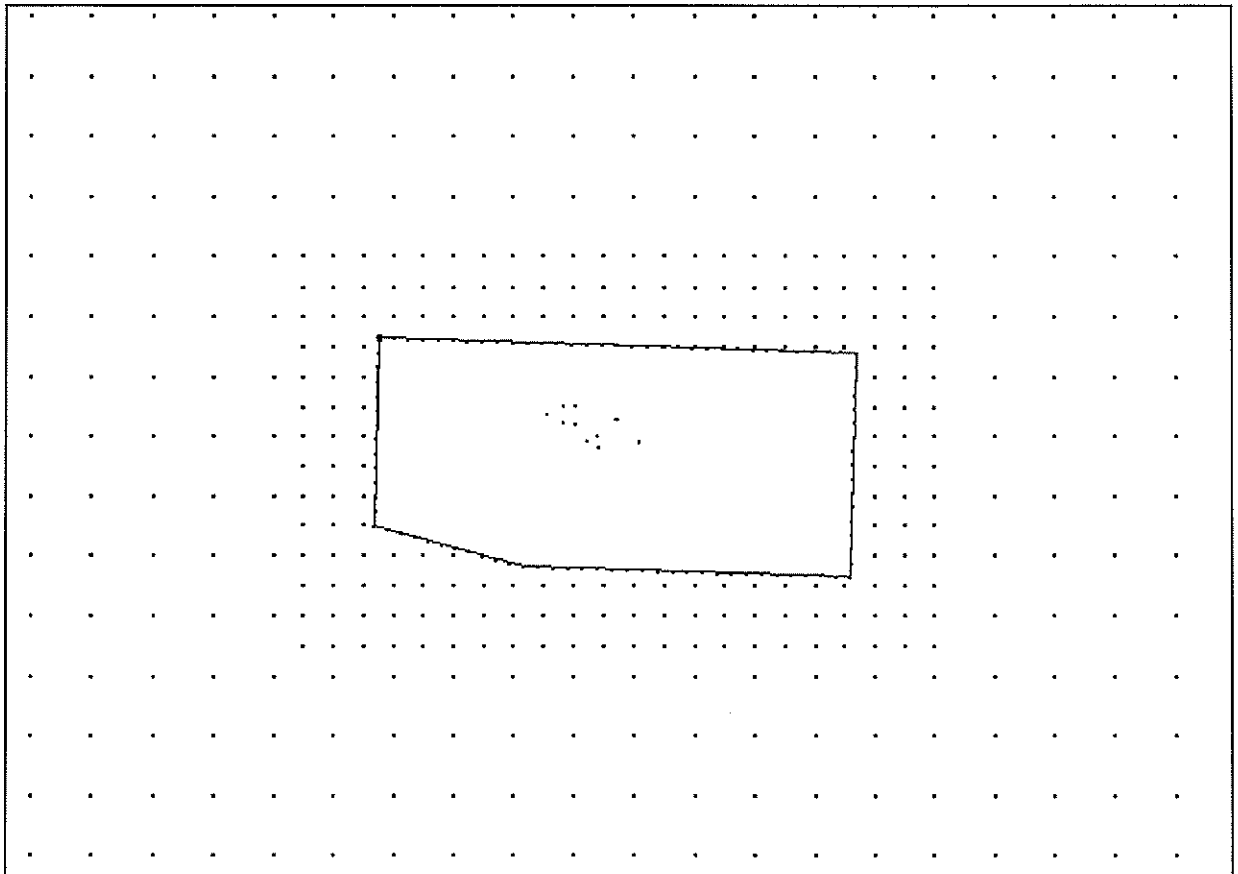

Figure 3-4. WADSWORTH I-84 DECLO EXIT SITE CBP NEAR-FIELD RECEPTOR GRID

3.2 Emission Release Parameters and Emission Rates

Emission release parameters used for this project analyses are shown in Table 5. For this project, JBR conservatively treated all sources associated with the batch plant operations as volume sources. Assumptions and calculations for release parameters for the sources were not provided. DEQ estimated the source dimensions based on the submitted values and modeling guidance for calculating volume source parameters (see Notes f, g beneath Table 5). Volume source parameters are within the expected range for these types of sources. Emissions from the generator sets were modeled as point source releases. The exhaust temperatures appear to be high, based on DEQ's experience with similar equipment. The release velocity for GEN_600 was modeled at 121.7 meters per second (272 miles per hour). Exit velocities above 50 m/sec are not typically seen for stack emissions. DEQ's verification analyses used a more reasonable, and conservative, value of 25 m/sec for GEN_600, and exhaust temperatures of 700°F (rather than ~1,000 °F) for each of the two generators. Values used in DEQ's verification analyses, where different from the submitted analyses, are shown in parentheses in the table.

Table 5. EMISSION RELEASE PARAMETERS									
Source ID	Description	UTM Zone 12 (NAD27)		Elevation (m) [a]	Stack Height (ft) [a1]	Stack Temp. (°F) [c]	Stack Velocity (m/sec) [d]	Stack Diameter (ft) [a1]	Stack Orientation [e]
		Easting (m)[a]	Northing (m) [a]						
Point Sources									
GEN_600	600kw Gen-set	285106.8	4716289	1265.02	12.5	956.1 (700)	121.7 (25)	0.83	Default
GEN_75	75kw Gen-set	285106.7	4716294	1264.96	6	1094 (700)	17.41	0.30	Default
Volume Sources									
Source ID	**Description**	**Easting (m)[a]**	**Northing (m) [a]**	**Elevation (m) [a]**	**Release Height (ft) [a1]**		**Initial Horiz. Dimension σ_Y (m) [f]**	**Initial Vertical Dimension σ_Z (m) [g]**	
V.001	Aggregate Delivery to Ground Storage	284982.6	4716352	1264.94	8.20 2.5 m		4.0	4.0	
V.002	Sand Delivery to Ground Storage	284982.2	4716323	1265.1	8.20 2.5 m		4.0	4.0	
V.003	Aggregate Transfer to Conveyor	285004.1	4716351	1264.92	11.48 3.5 m		2.0	2.0	
V.004	Sand Transfer to Conveyor	285002.8	4716321	1264.96	11.48 14 m		2.0	2.0	
V.005	Aggregate Transfer to Elevated Storage	285041.2	4716302	1264.89	45.93 14 m		2.0	2.0	
V.006	Sand Transfer to Elevated Storage	285022.4	4716293	1265.07	45.93 14 m		2.0	2.0	
V.007	Cement\Fly Ash Delivery to Silo	285071.7	4716328	1264.62	45.93 14 m		2.0	2.0	
V.008	Weigh hopper loading	285042.9	4716281	1265.31	32.81 10 m		2.0	2.0	
V.009	Central mix loading	285042.9	4716281	1265.31	22.97 7 m		2.0	2.0	
V.010	Stock Pile Loading/Unloading	284953.8	4716336	1265.04	11.48 3.5 m		10.0	5.0	

Table 5 Notes

[a] m = meters
[a1] ft = feet
[b] g/sec = grams per second.
[c] °F = degrees Fahrenheit
[d] m/sec = meters per second.
[e] Default stack orientation is vertical and uncapped.
[f] Initial horizontal dimension, Source length divided by 4.3 for single volume sources.
Initial source lengths: V.001-V.002 = 17.2 m, V.003-V.009 = 8.6 m, and V.010 = 43 m.
(DEQ estimations based on submitted values)
[g] Initial vertical dimension,
Surface-based source. Vertical dimension of source divided by 2.15.
Vertical Dimension: V.001-V.002 = 8.6 m V.010 = 10.75 m *(DEQ estimations based on submitted values)*
Elevated source not on or adjacent to a building. Vertical dimension of source divided by 4.3.
Vertical Dimension: V.003-V.009 = 8.6 m *(DEQ estimations based on submitted values)*

3.2.1 Criteria Pollutant Emissions Rates

Criteria pollutant emissions modeled for this project include PM_{10} from materials handling and diesel combustion, and NO_2/SO_2 from diesel combustion in the generator sets. Emissions used in the submitted modeling are shown in Table 6. The emissions were modeled in the submitted analyses using an hour-of-day file (6 a.m. to 6 p.m.) for 365 operating days per year. These emissions were reportedly calculated based on the following assumptions:

- Concrete batch plant production rate at the Declo Exit site equals 220 cy/hr and 72,000 cy/year. Emission rates input into the model were adjusted by JBR to reflect these production levels.
- Pound per hour emission rates used for annual period modeling appeared to be based on dividing the tons per year emissions from each pollutant by 8,760. The model, however, also used an hour-of-day file that presumed that pollutants were emitted only from 6 a.m. to 6 p.m. This approach meant that only half the emissions were incorporated in the resulting ambient impacts.

DEQ's verification modeling was based on the following assumptions:

- Maximum concrete batch plant production rate is equal to the plant rating of 280 cy/hr.
- Maximum concrete batch plant production at the Declo Exit site is 72,000 cy/year.
- Concrete production at the I-84 Declo Exit could occur at any time during the period from March 1 through October 31. DEQ's review of climate data for Boise showed that temperatures are consistently near or below freezing during November through February. Annectodotal evidence suggests that temperatures in the Burley area (near the Declo Exit) are typically colder than in Boise. DEQ's previous experience with Idaho Transportation Department (ITD) roadway projects indicates that the concrete cannot be placed unless ambient temperatures are well above freezing and the ground surface is not frozen.
- Concrete production occurs during the hours from 9 p.m. to 9 a.m. seven days per week. Operation during evening and early morning hours when temperatures are cooler and winds are calmer typically results in less dispersion, i.e., higher or more conservative estimates of the near-field maximum ambient impacts.
- Both generators operate at maximum capacity for 24 hours per day from March 1 through October 31.
- Emissions from the generator engines were based on engine ratings of 1,004 bhp (600kW$_e$) and 126 bhp (75 kW$_e$).
- Maximum diesel fuel sulfur content is 0.05%. JBR Analyses assumed 0.5% sulfur diesel fuel. Federal law currently prohibits using diesel with a sulfur content greater than 0.05% in non-road engines (40 CFR 89.110.5a and 40 CFR 60 Subpart IIII)
- Best management practices required in the permit result in 75% control of fugitive emissions from sand and aggregate handling, compared to uncontrolled emissions.
- Source V.010 was omitted from the verification modeling analyses. Fugitive emissions associated with filling a front loader bucket from the storage piles should be negligible if the operator is using BMPs as required.

Modeled criteria pollutant emission rates are shown in Table 6. Values used in DEQ's verification analyses, where different from the submitted analyses, are shown in parentheses.

Table 6. MODELED EMISSION RATES - CRITERIA POLLUTANTS							
Source ID	Description	PM_{10}	PM_{10} Annual	CO	NO_2	SO_2	SO_2 Annual
		(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)
GEN_600	1,004 bhp Engine	0.025 (0.031)	2.27E-03 (0.031)	0.310	0.896 (12.24)	3.218 (0.406)	0.294 (0.406)
GEN_75	126 bhp Engine	0.042 (0.0528)	3.85E-03 (0.0528)	0.331	0.0514 (0.706)	0.206 (0.0258)	0.019 (0.0258)
V.001	Aggregate Delivery to Ground Storage	0.68 (0.217)	2.51E-02 (0.217)				
V.002	Sand Delivery to Ground Storage	0.15 (0.049)	6.85E-03 (0.049)				
V.003	Aggregate Transfer to Conveyor	0.68 (0.217)	2.51E-02 (0.217)				
V.004	Sand Transfer to Conveyor	0.15 (0.049)	6.85E-03 (0.049)				
V.005	Aggregate Transfer to Elevated Storage	0.68 (0.217)	2.51E-02 (0.217)				
V.006	Sand Transfer to Elevated Storage	0.15 (0.049)	6.85E-03 (0.049)				
V.007	Cement\Fly Ash Delivery to Silo	0.07 (0.084)	2.28E-03 (0.084)				
V.008	Weigh hopper loading	0.84 (1.06)	3.20E-02 (1.06)				
V.009	Central mix loading	0.41 (0.524)	1.60E-02 (0.524)				
V.010	Stock Pile Loading/ Unloading	0.46 (- 0 -)	6.16E-02 (- 0 -)				

TAPs emissions required to be modeled for this project were limited to arsenic from cement and flyash handling, and the 7-PAH group subset of polycyclic organic matter (POM) from diesel combustion in the two generators. Each of these TAPs is a carcinogen subject to an annual state standard. Emissions used in the modeling are shown in Table 7. Values used in DEQ's verification analyses, where different from the submitted analyses, are shown in parentheses.

Table 7. MODELED EMISSION RATES - TOXIC AIR POLLUTANT EMISSIONS			
Source ID	Description	Arsenic (Annual)	POM (7-PAH Group) (Annual)
		(lb/hr)	(lb/hr)
GEN_600	1,004 bhp Engine	---	--- (3.16E-05) [a]
GEN_75	126 bhp Engine	---	--- (3.03E-06) [a]
V.007	Cement\Fly Ash Delivery to Silo	3.08E-07 (1.05E-05) [a]	---
V.009	Central mix loading	3.08E-07 (1.48E-06) [a]	---

[a] To avoid computations using very small numbers within AERMOD, emission rates were multiplied by 1.0E+06 prior to inputting the value in DEQ's TAPs verification analyses.

3.3 Results for Significant and Full NAAQS Impact Analyses

This is the initial Idaho permit for this concrete batch plant facility. A significance analysis was not required. JBR conducted full impact analyses for this project. Analyses for each pollutant were conducted for each of five years of meteorological data. DEQ's verification analyses were conducted for each of the five years of met data, except for 24-hr PM_{10}, which was conducted using a concatenated 5-year met file. The results of these analyses are shown in Table 8. Results from DEQ's verification analyses, where different from the submitted analyses, are shown in parentheses.

Table 8. RESULTS FOR FULL IMPACT ANALYSES

Pollutant	Averaging Period	Modeled Ambient Impact ($\mu g/m^3$)	Background Concentration ($\mu g/m^3$)	Total Ambient Impact ($\mu g/m^3$)	NAAQS[a] ($\mu g/m^3$)	Percent of NAAQS
PM_{10}	24-hour	69.71[b] 82.02[c] (41.31)[d]	73	142.7[b] 155[c] (114)[d]	150	95.1%[b] 103%[c] (76.2%)[d]
	Annual	0.35 (6.23)	26	26.35 (32.2)	50	52.7% (64.5%)
NO_2	Annual	0.17 (7.20)	17	17.2 (24.2)	100	17.2% (24.2%)
SO_2	3-hr	28.98[e] 31.20[f] (10.5)[g]	34	62.98[e] 65.20[f] (44.5)[g]	1300	4.8%[e] 5.0%[f] (3.4%)[g]
	24-hr	6.38[e] 7.01[f] (3.50)[g]	26	32.38[e] 33.01[f] (29.5)[g]	365	8.9%[e] 9.0%[f] (8.1%)[g]
	Annual	0.06 (0.25)	8	8.06 (8.25)	80	10.1% 10.3%

[a] Defined in Idaho Air Rules Section 577.
[b] JBR's submitted modeling analysis reported the lowest 1[st] high value.
[c] High 2[nd] high value from JBR's submitted modeling analyses.
[d] High 6[th] high value from DEQ's verification modeling analyses.
[e] Second-high 2[nd] high value from JBR's submitted modeling analyses.
[f] High 2[nd] high value from JBR's submitted modeling analyses.
[g] High 2[nd] high value from DEQ's verification modeling analyses.

3.4 Results for TAPs Analyses

Results are shown only for the TAPs that DEQ determined were required to be modeled to demonstrate compliance. Results from DEQ's verification analyses, where different from the submitted analyses, are shown in parentheses.

Table 9. RESULTS FOR TAP IMPACT ANALYSES

Pollutant	Averaging Period	Total Ambient Impact ($\mu g/m^3$)[b]	AACC[a] ($\mu g/m^3$)	Percent of AACC
Arsenic	Annual	0 (1.17E-05)	2.35E-04	0% (5.0%)
POM (7-PAH Group)	Annual	-not modeled- (2.11E-05)	3.0E-04	--- (7.0%)

[a] Acceptable ambient concentration for carcinogens (AACC).
[b] High first high reported for all five modeled years.

The results of DEQ's modeling analyses for 24-hour PM_{10} ambient impacts are shown in Figure 3-5. A background value of 73 $\mu g/m^3$ has been added to the concentration at each receptor. For comparison, the 24-hr PM_{10} NAAQS is 150 $\mu g/m^3$.

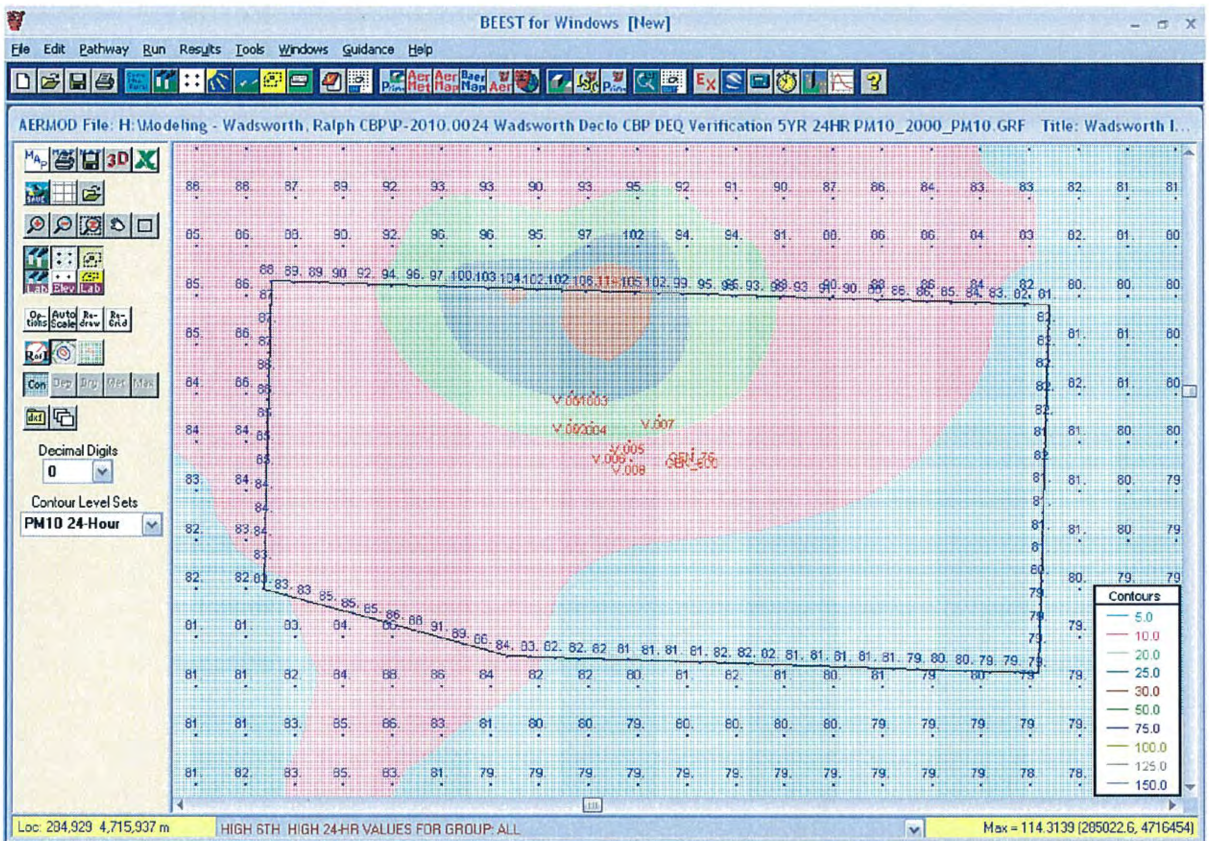

Figure 3-5 PM_{10} DESIGN CONCENTRATION IMPACTS – 24-HOUR AVERAGING PERIOD

4.0 Conclusions

The submitted ambient air impact analyses, combined with DEQ's verification analyses, demonstrated to DEQ's satisfaction that emissions from the facility will not cause or significantly contribute to a violation of any air quality standard.

BOISE

			Concrete & Asphalt Season – Boise - 1998-2008				
	Autumn End Date	**Day of Year**	**Spring Start Date**	**Day of Year**	**Number of Freezing Days**		
	11/20/1998	324	4/1/1999	91	132		
	11/21/1999	325	3/31/2000	91	131		
	10/31/2000	305	3/20/2001	79	140		
	11/20/2001	324	3/20/2002	79	120		
	11/10/2002	314	3/5/2003	64	115		
	10/21/2003	294	3/20/2004	80	151		
	11/15/2004	320	3/1/2005	60	106		
	11/5/2005	309	3/15/2006	74	130		
	11/5/2006	309	3/5/2007	64	120		
	11/15/2007	319	4/15/2008	75	152	**Average Season (Days)**	**Average Season (Hours)**
Average	**11/10**	314	**3/17**	76	130	**235**	**5,647**
Std Dev	**10**	10	**11**	11	15		
	Latest End		**Earliest Start**		**Shortest Freeze (Days)**	**Longest Season (Days)**	**Longest Season (Hrs)**
	11/20	324	3/6	65	106	**259**	**6,216**

Source: NOAA National Climate Data Center

Burley temperatures are typically colder than in Boise. Presume concrete batch plant season at I-84 Declo Exit runs from:

March 1st through October 31st

APPENDIX D – AMBIENT AIR QUALITY ANALYSIS – OTHER SITES

MEMORANDUM

DATE: March 24, 2010

TO: Eric Clark, Air Program

FROM: Kevin Schilling, Stationary Source Modeling Coordinator, Air Program

PROJECT: PTC Applications for a Concrete Batch Plant using DEQ's General Modeling Developed for such Plants – in support of project P-2010.0024

SUBJECT: Demonstration of Compliance with IDAPA 58.01.01.203.02 (NAAQS) and 203.03 (TAPs)

1.0 Summary

A Permit to Construct (PTC) application has been received for a portable concrete batch plant (CBP) to be operated in Idaho. Non-site-specific air quality impact analyses involving atmospheric dispersion modeling of emissions associated with CBPs meeting specific criteria were performed by DEQ to demonstrate that such facilities would not cause or significantly contribute to a violation of any ambient air quality standard (IDAPA 58.01.01.203.02 and 203.03 [Idaho Air Rules Section 203.02 and 203.03]). The permit applicant submitted applicable information and data for DEQ to evaluate whether the proposed facility met the criteria for using DEQ's non-site-specific HMA ambient impact analyses.

A technical review of the submitted information was conducted by DEQ. DEQ staff performed non-site-specific detailed air quality impact analyses to assure compliance with air quality standards for CBPs meeting specified criteria for various production levels and operational configurations. Results from DEQ's analyses were used to establish minimum setback distances between emissions points and the property boundary of the site. The submitted information, in combination with DEQ's air quality analyses: 1) utilized appropriate methods and models; 2) was conducted using reasonably accurate or conservative model parameters and input data; 3) adhered to established DEQ guidelines for new source review dispersion modeling; 4) showed that predicted pollutant concentrations from emissions associated with the facility, when appropriately combined with background concentrations, were below applicable air quality standards at all locations outside of the required setback distance (closest distance from pollutant emission points to the property boundary). Table 1 presents key assumptions and results to be considered in the development of the permit.

Air impact analyses are required by Idaho Air Rules to be conducted according to methods outlined in 40 CFR 51, Appendix W (Guideline on Air Quality Models). Appendix W requires that facilities be modeled using emissions and operations representative of design capacity or as limited by a federally enforceable permit condition. The submitted analyses, in combination with DEQ's analyses, demonstrated to the satisfaction of the Department that operation of the proposed facility or modification will not cause or significantly contribute to a violation of any ambient air quality standard, provided the following key conditions are representative of facility design capacity or operations as limited by a federally enforceable permit condition:

- Maximum throughput of 2,500 cubic yards per day and 150,000 cubic yards per year.
- Generators powered by diesel engines of less than a combined 1,340 hp operating at the site.
- A diesel-fired boiler of less than 5.0 MMBtu/hr heat input.
- Emissions points are no closer to the property boundary than 58 meters for < 1,000 cy/day, 73 meters for 1,000 – 1,500 cy/day, and 127 meters for 1,500 – 2,500 cy/day.
- Fugitive emissions from material handling and vehicle traffic are controlled to a moderate degree (75% control beyond base emissions levels).
- The CBP is not located where there are co-contributing air pollution point sources within 1,000 feet of emissions sources associated with the CBP.
- Emissions rates for applicable averaging periods are not greater than those used in the modeling analyses, as listed in this memorandum.
- Stack heights for the drum dryer, tank heater, and generator are as listed in this memorandum.
- Stack parameters of exhaust temperature and flow rate should not be less than about 75 percent of values listed in this memorandum.

Table 1 presents key assumptions and results that should be considered in the development of the permit.

Table 1. KEY DATA, ASSUMPTIONS, AND CONCLUSIONS OF THE MODELING ANALYSES

Criteria/Assumption/Result	Explanation/Consideration
Emissions units must maintain the following setback distances from the nearest property boundary, as a function of throughput: 58 meters for < 1,000 cy/day; 73 meters for 1,000 – 1,500 cy/day; 127 meters for 1,500 – 2,500 cy/day.	These setback distances are necessary to assure compliance with applicable air quality standards at all ambient air locations.
Co-contributing emissions sources such as other CBPs, HMAs, or rock crushing plants may not be operated at the site.	Emissions are considered co-contributing if they occur within 1,000 feet (305 meters) of each other.
The CBP may not locate in any non-attainment areas.	All analyses performed assumed the facility will be located in areas attaining air quality standards for those pollutants emitted from the CBP.
A compliance demonstration for the 1-hour NO2 standard, effective January 22, 2010, was not performed.	This standard will not be applicable for permitting purposes in Idaho until it is incorporated by reference into Idaho Air Rules (estimated to be spring 2011).

2.0 Background Information

2.1 Applicable Air Quality Impact Limits and Modeling Requirements

This section identifies applicable ambient air quality limits and analyses used to demonstrate compliance.

2.1.1 Area Classification

The CBP will be a portable facility. The CBP will only locate in areas designated as attainment or unclassifiable for all criteria pollutants.

2.1.2 Significant and Cumulative NAAQS Impact Analyses

If estimated maximum pollutant impacts to ambient air from the emissions sources associated with the proposed new facility exceed the significant contribution levels (SCLs) of Idaho Air Rules Section

006.102, then a cumulative NAAQS impact analysis is necessary to demonstrate compliance with National Ambient Air Quality Standards (NAAQS) and Idaho Air Rules Section 203.02. A cumulative NAAQS impact analysis for attainment area pollutants involves adding ambient impacts from facility-wide emissions, and emissions from any nearby co-contributing sources, to DEQ-approved background concentration values that are appropriate for the criteria pollutant/averaging-time at the facility location and the area of significant impact. The resulting maximum pollutant concentrations in ambient air are then compared to the NAAQS listed in Table 2. Table 2 also lists SCLs and specifies the modeled value that must be used for comparison to the NAAQS.

Table 2. APPLICABLE REGULATORY LIMITS

Pollutant	Averaging Period	Significant Contribution Levels[a] (μg/m³)[b]	Regulatory Limit[c] (μg/m³)	Modeled Value Used[d]
PM_{10}[e]	Annual[f]	1.0	50[g]	Maximum 1st highest[h]
	24-hour	5.0	150[i]	Maximum 6th highest[j]
$PM_{2.5}$[k]	Annual	Not established	15	Use PM_{10} as surrogate
	24-hour	Not established	35	Use PM_{10} as surrogate
Carbon monoxide (CO)	8-hour	500	10,000[l]	Maximum 2nd highest[h]
	1-hour	2,000	40,000[l]	Maximum 2nd highest[h]
Sulfur Dioxide (SO_2)	Annual	1.0	80[g]	Maximum 1st highest[h]
	24-hour	5	365[l]	Maximum 2nd highest[h]
	3-hour	25	1,300[l]	Maximum 2nd highest[h]
Nitrogen Dioxide (NO_2)	Annual	1.0	100[g]	Maximum 1st highest[h]
	1-hour	Not established	189	Mean of maximum 8th highest[h,m]
Lead (Pb)	Quarterly	NA	1.5[g]	Maximum 1st highest[h]
	3-month	NA	0.15[n]	Maximum 1st highest[h]

a. Idaho Air Rules Section 006.102
b. Micrograms per cubic meter
c. Idaho Air Rules Section 577 for criteria pollutants
d. The maximum 1st highest modeled value is always used for the significant impact analysis
e. Particulate matter with an aerodynamic diameter less than or equal to a nominal ten micrometers
f. The annual PM_{10} standard was revoked in 2006. The standard is still listed because compliance with the annual $PM_{2.5}$ standard is demonstrated by a PM_{10} analysis that demonstrates compliance with the revoked PM_{10} standard.
g. Never expected to be exceeded in any calendar year
h. Concentration at any modeled receptor
i. Never expected to be exceeded more than once in any calendar year
j. Concentration at any modeled receptor when using five years of meteorological data
k. Particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers
l. Not to be exceeded more than once per year
m. Mean (of 5 years of data) of the maximum of 8th highest daily 1-hour maximum modeled concentrations for each year of meteorological data modeled.
n. 3-month rolling average

New source review requirements for assuring compliance with $PM_{2.5}$ standards have not yet been completed and promulgated into regulation. EPA has asserted through a policy memorandum that compliance with $PM_{2.5}$ standards will be assured through an air quality analysis for the corresponding PM_{10} standard. Although the PM_{10} annual standard was revoked in 2006, compliance with the revoked PM_{10} annual standard must be demonstrated as a surrogate to the annual $PM_{2.5}$ standard.

New NO_2 and SO_2 short-term standards have recently been promulgated or are in development by EPA. The standards will not be applicable for permitting purposes in Idaho until they are incorporated by reference into Idaho Air Rules.

DEQ used non-site-specific full impact analyses to demonstrate compliance with Idaho Air Rules Section 203.02. Established setback distances are minimal distances needed to assure compliance with standards, considering the impact of the HMA plant and a conservative background value.

2.1.3 Toxic Air Pollutant Analyses

Emissions of toxic substances are generally addressed by Idaho Air Rules Section 161:

> *Any contaminant which is by its nature toxic to human or animal life or vegetation shall not be emitted in such quantities or concentrations as to alone, or in combination with other contaminants, injure or unreasonably affect human or animal life or vegetation.*

Permit requirements for toxic air pollutants from new or modified sources are specifically addressed by Idaho Air Rules Section 203.03 and require the applicant to demonstrate to the satisfaction of DEQ the following:

> *Using the methods provided in Section 210, the emissions of toxic air pollutants from the stationary source or modification would not injure or unreasonably affect human or animal life or vegetation as required by Section 161. Compliance with all applicable toxic air pollutant carcinogenic increments and toxic air pollutant non-carcinogenic increments will also demonstrate preconstruction compliance with Section 161 with regards to the pollutants listed in Sections 585 and 586.*

Per Section 210, if total project-wide emissions increases associated with a new source or modification exceeds screening emission levels (ELs) of Idaho Air Rules Section 585 or 586, then the ambient impact of the emissions increase must be estimated. If ambient impacts are less than applicable Acceptable Ambient Concentrations (AACs) for non-carcinogens of Idaho Air Rules Section 585 and Acceptable Ambient Concentrations for Carcinogens (AACCs) of Idaho Air Rules Section 586, then compliance with TAP requirements has been demonstrated. If DEQ determines T-RACT is used to control emissions of carcinogenic TAPs, then modeled concentrations of 10 times the AACC are considered acceptable, as per Idaho Air Rules Section 210.12.

2.2 Background Concentrations

Background concentrations are used in the cumulative NAAQS impact analyses to account for impacts from sources not explicitly modeled. Table 3 lists appropriate background concentrations for rural Idaho areas.

Background concentrations were revised for all areas of Idaho by DEQ in March 2003[1]. Background concentrations in areas where no monitoring data are available were based on monitoring data from areas with similar population density, meteorology, and emissions sources. Background concentrations in the DEQ non-site-specific analyses were based on DEQ default values for rural/agricultural areas.

Table 3. BACKGROUND CONCENTRATIONS

1 Hardy, Rick and Schilling, Kevin. *Background Concentrations for Use in New Source Review Dispersion Modeling*. Memorandum to Mary Anderson, March 14, 2003.

Pollutant	Averaging Period	Background Concentration ($\mu g/m^3$)[a]
PM_{10}[b]	24-hour	73
	Annual	26
Carbon monoxide (CO)	1-hour	3,600
	8-hour	2,300
Sulfur dioxide (SO_2)	3-hour	34
	24-hour	26
	Annual	8
Nitrogen dioxide (NO_2)	Annual	17
Lead (Pb)	Quarterly	0.03

a. Micrograms per cubic meter

b. Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers

3.0 Modeling Impact Assessment

3.1 Modeling Methodology

This section describes the modeling methods used by DEQ to demonstrate compliance with applicable air quality standards.

3.1.1 Overview of Analyses

DEQ performed general non-site-specific analyses that were determined to be reasonably representative of all CBPs meeting DEQ-specified criteria, and the results demonstrate compliance with applicable air quality standards to DEQ's satisfaction.

Table 4 provides a brief description of parameters used in the DEQ modeling analyses.

Table 4. MODELING PARAMETERS		
Parameter	**Description/Values**	**Documentation/Addition Description**[a]
General facility location	Portable	Can only locate in attainment or unclassifiable areas
Model	AERMOD	AERMOD with the PRIME downwash algorithm, version 07026
Meteorological data	Multiple Data Sets	See Section 3.1.4
Terrain	Flat	The analyses assumed flat terrain for the immediate area
Building downwash	Considered	A building of 10 m X 10 m X 10 m high was assumed for downwash consideration.
Receptor Grid	Grid 1	5-meter spacing along the property boundary out 100 meters
	Grid 2	10-meter spacing out to 200 meters

3.1.2 Modeling protocol and Methodology

A modeling protocol was not submitted to DEQ prior to the application because DEQ staff performed non-site-specific air quality impact analyses. Non-site-specific modeling was generally conducted using data and methods described in the *State of Idaho Air Quality Modeling Guideline.*

Because of the portable nature of the CBP, DEQ performed non-site-specific modeling to establish setback distances between emissions source locations and the property boundary for a series of CBP production rates.

3.1.3 Model Selection

Idaho Air Rules Section 202.02 require that estimates of ambient concentrations be based on air quality models specified in 40 CFR 51, Appendix W (Guideline on Air Quality Models). The refined, steady state, multiple source, Gaussian dispersion model AERMOD was promulgated as the replacement model for ISCST3 in December 2005. EPA provided a 1-year transition period during which either ISCST3 or AERMOD could be used at the discretion of the permitting agency. AERMOD must be used for all air impact analyses, performed in support of air quality permitting, conducted after November 2006.

AERMOD retains the single straight line trajectory of ISCST3, but includes more advanced algorithms to assess turbulent mixing processes in the planetary boundary layer for both convective and stable stratified layers.

AERMOD offers the following improvements over ISCST3:

- Improved dispersion in the convective boundary layer and the stable boundary layer
- Improved plume rise and buoyancy calculations
- Improved treatment of terrain affects on dispersion
- New vertical profiles of wind, turbulence, and temperature

AERMOD was used for the DEQ analyses.

3.1.4 Meteorological Data

Because of the portable nature of CBPs, DEQ used seven different meteorological data sets from various locations in Idaho to assure compliance with applicable standards for the non-site-specific analyses. Table 5 lists the meteorological data sets used in the air impact analyses.

Table 5. METEOROLOGICAL DATA SETS USED IN MODELING ANALYSES

Surface Data	Upper Air Data	Years
Boise	Boise	1988-1992
Aberdeen	Boise	2001-2005
Idaho Falls	Boise	2000-2004
Minidoka	Boise	2000-2004
Soda Springs	Boise	2004-2008
Lewiston	Spokane, Wa	1992-1995, 1997
Sandpoint	Spokane, Wa	2002-2006

Use of representative meteorological data is of greater concern when using AERMOD than when using ISCST3. This is because AERMOD uses site-specific surface characteristics to more accurately account for turbulence. To account for this uncertainty, the following measures were taken:

- Use the maximum of 2^{nd} high modeled concentration to evaluate compliance with the 24-hour PM_{10} standard, rather than the maximum of 6^{th} high modeled concentration typically used when modeling a five-year meteorological data set to demonstrate that the standard will not be exceeded more than once per year on average over a three year period.

- Use the maximum of 1^{st} high modeled concentration to evaluate compliance with all pollutants and averaging times, except for 24-hour PM_{10}.

3.1.5 Terrain Effects

Terrain effects on dispersion were not considered in the non-site-specific analyses. Flat terrain was an appropriate assumption because most emissions sources associated with CBPs are near ground-level and the immediate surrounding area is typically flat for dispersion modeling purposes. Emissions sources near ground-level typically have maximum pollutant impacts near the source, minimizing the potential affect of surrounding terrain to influence the magnitude of maximum modeled impacts.

3.1.6 Facility Layout

DEQ's analyses used a conservative generic facility layout. This was done because the specific layout will vary depending upon product needs and specific characteristics of the site. To provide conservative results, DEQ used a tight grouping of emissions sources. Sources were positioned within 2.5 meters of the center of the facility.

3.1.7 Building Downwash

DEQ's analyses accounted for building downwash in a fairly general manner because of the following:

- Determining a building configuration is extremely difficult given the portable nature of the facility.
- Many CBP have at least semi-permanent structures associated with them, even though the permit will be for portable source.
- Much of the equipment is porous with regard to wind, thereby minimizing downwash effects.

Downwash was accounted for by placing a 10 meter by 10 meter by 10 meter high building among the sources.

3.1.8 Ambient Air Boundary

DEQ's non-site-specific analyses, using a generic facility layout, were used to generate minimum setback distances between emissions units and the property boundary. The issued permit will require this distance be maintained at all locations.

3.1.9 Receptor Network and Generation of Setback Distances

A circular grid with 5.0 meter receptor spacing, extending out to 100 meters was used in the non-site-specific modeling performed by DEQ. To establish a setback distance, the following procedure was followed for various production levels and operational configurations:

1) Trigger values for the modeling analyses were determined. These are values, when combined with background concentrations, indicated an exceedance of a standard. They were calculated by subtracting the background value from the standard (because the model does not specifically include background in the results). The following are trigger values:

PM_{10}	24-hour	77 $\mu g/m^3$
	annual	24 $\mu g/m^3$
SO_2	3-hour	1266 $\mu g/m^3$
	24-hour	339 $\mu g/m^3$
	annual	72 $\mu g/m^3$

CO	1-hour	36400 μg/m^3
	8-hour	7700 μg/m^3
NO_2	annual	83 μg/m^3

2) For each operational configuration scenario, pollutant, averaging period, and meteorological data set, all receptors with concentrations equal or greater than the trigger value were plotted. This effectively gave a plot of receptors where the standard could be exceeded for that pollutant and averaging period.

3) The controlling receptor for each pollutant, averaging period, and meteorological data set was identified. First, the receptor having a concentration in excess of the trigger value that was the furthest from any emissions source was identified. The controlling receptor was the next furthest downwind receptor from that point.

4) The minimum setback distance was calculated. This was the furthest distance between an emissions point and the controlling receptor.

3.2 Emission Rates

Emissions rates of criteria pollutants and TAPs were calculated for several CBP production rates and operational configurations for various applicable averaging periods.

3.2.1 Criteria Pollutant Emissions Rates

Table 6 lists criteria pollutant emissions rates used in the DEQ non-site-specific modeling analyses for various CBP production rates, operational configurations, and for all averaging periods. Attachment 1 provides additional details of DEQ emissions calculations.

3.2.2 TAP Emissions Rates

Table 7 lists TAP emissions rates for setback-controlling TAPs.

3.3 Emission Release Parameters and Plant Criteria

Table 8 lists the characteristics of CBPs used in DEQ's non-site-specific CBP air impact analyses. Different scenarios were used to generate different setback distances depending upon throughput rates and operational configurations.

Table 9 provides emissions release parameters for the analyses including stack height, stack diameter, exhaust temperature, and exhaust velocity. Additional details are provided in Attachment 1.

DEQ modeling staff will make the determination of whether any release parameters slightly outside of those listed in Table 8 and 9 are still adequate for using DEQ's non-site-specific air impact analyses for the application in question.

3.4 Results for Cumulative NAAQS Impact Analyses and TAPs Analyses

DEQ determined required setback distances from the non-site-specific modeling results for each CBP production level scenario, criteria pollutant, and averaging period. Table 10 lists setback distances for each production level scenario and averaging period.

4.0 Conclusions

The ambient air impact analyses demonstrated to DEQ's satisfaction that emissions from the facility will not cause or significantly contribute to a violation of any air quality standard.

Table 6. EMISSIONS USED IN DEQ ANALYSES						
Emissions Point in Model	**Pollutant**	**Averaging Period**	**Emissions Rate (lb/hr)**			
			500 cy/day 150,000 cy/yr	**1,000 cy/day**	**1,500 cy/day**	**2,500 cy/day**
TRUCKLOD[a] – truck loadout - controlled by 95% by boot, etc.	PM_{10}	24-hour	0.08166	0.1633	0.2450	0.4083
		annual	0.06712			
TRKLDBAG[a] – truck loadout - controlled by 99% by baghouse	PM_{10}	24-hour	0.01633	0.03267	0.04900	0.08166
		annual	0.1342			
WEIGHOP – weigh hopper loading - controlled by baghouse	PM_{10}	24-hour	8.233E-4	1.647E-3	2.470E-3	4.117E-3
		annual	6.767E-4			
SILO – cement/ fly ash storage silo - controlled by fabric filter	PM_{10}	24-hour	5.464E-3	0.01093	0.01640	0.02732
		annual	4.491E-3			
BOILER[b] – 5 MMBtu/hr diesel boiler - 24 hr/day and 4380 hr/yr	PM_{10}	24-hour	0.1179	0.1179	0.1179	0.1179
		annual	0.05893	0.05893	0.05893	0.05893
	CO	1-hour 8-hour	0.1786	0.1786	0.1786	0.1786
	SO_2	3-hour	0.08518	0.08518	0.08518	0.08518
		24-hour	0.08518	0.08518	0.08518	0.08518
		Annual	0.04259	0.04259	0.04259	0.04259
	NOx	annual	0.4286	0.4286	0.4286	0.4286
NGBOILER[b] – 5 MMBtu/hr nat. gas boiler - 24 hr/day and 4380 hr/yr	PM_{10}	24-hour	0.03725	0.03725	0.03725	0.03725
		annual	0.01863	0.01863	0.01863	0.01863
	CO	1-hour 8-hour	0.4118	0.4118	0.4118	0.4118
	SO_2	3-hour	2.941E-3	2.941E-3	2.941E-3	2.941E-3
		24-hour	2.941E-3	2.941E-3	2.941E-3	2.941E-3
		Annual	1.471E-3	1.471E-3	1.471E-3	1.471E-3
	NOx	annual	0.2451	0.2451	0.2451	0.2451
GEN1 – electrical generator. - Emissions equal to a 1,000 kW powered engine (EPA Tier 2) burning diesel with a 0.0015 wt% sulfur content. - 24 hr/day and 4380 hr/yr	PM_{10}	24-hour	0.4409	0.4409	0.4409	0.4409
		annual	0.2205	0.2205	0.2205	0.2205
	CO	1-hour 8-hour	7.716	7.716	7.716	7.716
	SO_2	3-hour	0.01422	0.01422	0.01422	0.01422
		24-hour	0.01422	0.01422	0.01422	0.01422
		Annual	7.111E-3	7.111E-3	7.111E-3	7.111E-3
	NOx	annual	7.055	7.055	7.055	7.055
AGG&SND[c] – aggregate/sand transfers at ground level +75% control	PM_{10}	24-hour	0.03963	0.07924	0.1189	0.1981
		annual	0.03257			
AGGTOSTO[c] – agg./sand to elevated storage + 75% control	PM_{10}	24-hour	0.01982	0.03962	0.05944	0.09906
		annual	0.01628			
AGG&SND2[c] – aggregate/sand transfers at ground level +95% control	PM_{10}	24-hour	0.007924	0.01581	0.02378	0.03963
		annual	0.006513			
AGGTOST2[c] – agg./sand to elevated storage + 95% control	PM_{10}	24-hour	0.003962	0.007904	0.01189	0.01982
		annual	0.003257			

a. Impacts will be evaluated for multiple operational scenarios. Truck loadout emissions will either be modeled as controlled by a boot with 95% control efficiency (TRUCKLOD) or as captured and controlled by a baghouse with 99% control efficiency (TRKLDBAG).

b. Impacts will be evaluated for multiple operational scenarios. Boiler emissions will either be modeled as fueled by diesel (BOILER) or as fueled by natural gas (NGBOILER).

c. Impacts will be evaluated for multiple operational scenarios. Aggregate handling emissions will either be modeled as controlled by an additional 75% (AGG&SND and AGGTOSTO) or as controlled by an additional 95% (AGG&SND2 and AGGTOST2). Emissions calculated for a base 10 mph wind speed and a moisture content of 1.77% for aggregate and 4.17% for sand. Emissions in the model are varied with windspeed.

Table 7. TAP EMISSIONS USED IN DEQ ANALYSES			
Emissions Point in Model	**Pollutant**	**Averaging Period**	**Emissions Rate (lb/hr)**
			150,000 cy/yr
TRUCKLODa	Arsenic	period	7.340E-7
	Chromium 6+	period	5.861E-7
	Nickel	period	2.873E-6
TRKLDBAGa	Arsenic	.period	1.468E-7
	Chromium 6+	period	1.172E-7
	Nickel	period	5.746E-7
SILO	Arsenic	period	6.428E-7
	Chromium 6+	period	2.532E-7
	Nickel	period	1.601E-6
BOILERb	POM	period	2.086E-7
	Total PAH	period	2.018E-5
	Formaldehyde	period	5.893E-4
	Arsenic	period	1.000E-5
	Chromium 6+	period	0.0
	Nickel	period	7.500E-6
NGBOILERb	POM	period	2.794E-8
	Total PAH	period	1.495E-6
	Formaldehyde	period	1.838E-4
	Arsenic	period	4.902E-7
	Chromium 6+	period	0.0
	Nickel	period	5.147E-6
GEN1	POM	period	2.111E-5
	Total PAH	period	6.102E-4
	Formaldehyde	period	3.703E-4

a. Impacts will be evaluated for multiple operational scenarios. Truck loadout emissions will either be modeled as controlled by a boot with 95% control efficiency (TRUCKLOD) or as captured and controlled by a baghouse with 99% control efficiency (TRKLDBAG).

b. Impacts will be evaluated for multiple operational scenarios. Boiler emissions will either be modeled as fueled by diesel (BOILER) or as fueled by natural gas (NGBOILER).

Table 8. CHARACTERISTIC OF CBP USED IN DEQ GENERIC ANALYSES	
Parameter	**Value or Description**
Throughput Rates	Scenario 1: < 500 cy/day Scenario 1: < 1,000 cy/day Scenario 1: < 1,500 cy/day Scenario 1: < 2,500 cy/day Annual Scenario: 150,000 cy/yr
Co-Contributing Sources	The emissions points of the CBP may not be located within 1,000 feet of other permittable (has or would be required to have an air permit to operate) emissions sources.
Silo Filling (SILO) Stack Parameters	Point source controlled by fabric filter. Stack height ≥ 5 m
Weigh Hopper (WEIGHOP) Stack Parameters	Point source controlled by a baghouse. Stack height ≥ 3 m
Truck Loadout (TRUCKLOD) Stack Parameters (boot control)[a]	Fugitive source. Emissions controlled by 95% by a boot and/or water spray. Release height ≥ 5 m
Truck Loadout (TRKLDBAG) Stack Parameters (baghouse control)[a]	Point source controlled by a baghouse. Emissions 100% captured and controlled by baghouse at 99%. Stack height ≥ 5 m
Diesel Boiler (BOILER) Stack Parameters[b]	5 MMBtu/hr, diesel-fired. Operating < 4,380 hr/yr. Stack height ≥ 5 m
Natural Gas Boiler (NGBOILER) Stack Parameters[b]	5 MMBtu/hr, natural gas-fired. Operating < 4,380 hr/yr. Stack height ≥ 5
Electrical Power Generator (GEN1) Stack Parameters	Line power or generator with an engine of ≤ 1,000 kW fueled by low sulfur distillate (0.0015 wt% sulfur). ≤68.5 gal/hr, 24 hr/day, ≤4,380 hr/yr. Can use other generator type, provided operations are restricted such that emissions are equal to or less than a 1,000 kW engine at 24 hr/day, 4,380 hr/yr.
Frontend Loader Transfers at Ground Level (AGG&SND)	≤2 transfers each for any given quantity of aggregate and sand processed. Emissions are assumed controlled by an additional 75% beyond that associated with handling aggregate with a 1.77% moisture content and sand with a 4.17% moisture content.
Material Transfers to Elevated Storage (AGGTOSTO)	≤1 transfer each for any given quantity of aggregate and sand processed. Emissions are assumed controlled by an additional 75% beyond that associated with handling aggregate with a 1.77% moisture content and sand with a 4.17% moisture content.
Frontend Loader Transfers at Ground Level (AGG&SND2)	≤2 transfers each for any given quantity of aggregate and sand processed. Emissions are assumed controlled by an additional 95% beyond that associated with handling aggregate with a 1.77% moisture content and sand with a 4.17% moisture content.
Material Transfers to Elevated Storage (AGGTOST2)	≤1 transfer each for any given quantity of aggregate and sand processed. Emissions are assumed controlled by an additional 95% beyond that associated with handling aggregate with a 1.77% moisture content and sand with a 4.17% moisture content.

a. Impacts will be evaluated for multiple operational scenarios. Truck loadout emissions will either be modeled as controlled by a boot with 95% control efficiency (TRUCKLOD) or as captured and controlled by a baghouse with 99% control efficiency (TRKLDBAG).

b. Impacts will be evaluated for multiple operational scenarios. Boiler emissions will either be modeled as fueled by diesel (BOILER) or as fueled by natural gas (NGBOILER).

Table 9. EMISSIONS RELEASE PARAMETERS[a]					
Release Point /Location	**Source Type**	**Stack Height (m)[b]**	**Modeled Diameter (m)**	**Stack Gas Temp. (K)[c]**	**Stack Gas Flow Velocity (m/sec)[d]**
TRKLDBAG	Point	5.0	0.001[e]	0[f]	0.001[e]
SILO	Point	5.0	1.0[e]	0[f]	0.001[e]
BOILER	Point	5.0	0.2	450	12.1
NGBOILER	Point	5.0	0.3	450	10.48
Volume Sources					
Release Point /Location	**Source Type**	**Release Height (m)**	**Initial Horizontal Dispersion Coefficient σ_{y0} (m)**	**Initial Vertical Dispersion Coefficient σ_{z0} (m)**	
TRUCKLOD	Volume	5.0	4.65	4.65	
AGG&SND	Volume	2.0	2.33	0.7	
AGGTOSTO	Volume	5.0	2.33	4.65	
AGG&SND2	Volume	2.0	2.33	0.7	
AGGTOST2	Volume	5.0	2.33	4.65	

a. See Attachment 1 for additional details.
b. Meters
c. Kelvin
d. Meters per second
e. Set to limit momentum-induced plume rise since the stack may be capped or emissions may vent horizontally.
f. Using a temperature of 0 K directs the model to use a release temperature equal to ambient air.

Table 10. SETBACK DISTANCES AS A FUNCTION OF THROUGHPUT AND OPERATIONAL CONFIGURATION

CBP Configuration Scenario	Setback (m)	Controlling Pollutant	CBP Configuration Scenario	Setback (m)	Controlling Pollutant
Setbacks for 500 cubic yards per day and 150,000 cubic yards per year					
Scenario 1[a]: mod fugitive dust control, boot on loadout, diesel boiler, generator	58	TAPs	Scenario 9[i]: mod fugitive dust control, boot on loadout, nat. gas boiler, generator	58	TAPs
Scenario 2[b]: high fugitive dust control, boot on loadout, diesel boiler, generator	58	TAPs	Scenario 10[j]: high fugitive dust control, boot on loadout, nat. gas boiler, generator	58	TAPs
Scenario 3[c]: mod fugitive dust control, boot on loadout, diesel boiler, no generator	36	24hr PM_{10}	Scenario 11[k]: mod fugitive dust control, boot on loadout, nat. gas boiler, no generator	29	24hr PM_{10}
Scenario 4[d]: high fugitive dust control, boot on loadout, diesel boiler, no generator	34	24hr PM_{10}	Scenario 12[l]: high fugitive dust control, boot on loadout, nat. gas boiler, no generator	25	24hr PM_{10}
Scenario 5[e]: mod fugitive dust control, baghouse on loadout, diesel boiler, generator	58	TAPs	Scenario 13[m]: mod fugitive dust control, baghouse on loadout, nat. gas boiler, generator	58	TAPs
Scenario 6[f]: high fugitive dust control, baghouse on loadout, diesel boiler, generator	58	TAPs	Scenario 14[n]: high fugitive dust control, baghouse on loadout, nat. gas boiler, generator	58	TAPs
Scenario 7[g]: mod fugitive dust control, baghouse on loadout, diesel boiler, no generator	34	24hr PM_{10}	Scenario 15[o]: mod fugitive dust control, baghouse on loadout, nat. gas boiler, no generator	7	24hr PM_{10}
Scenario 8[h]: high fugitive dust control, boot on loadout, diesel boiler, no generator	29	24hr PM_{10}	Scenario 16[p]: high fugitive dust control, boot on loadout, nat. gas boiler, no generator	7	24hr PM_{10}
Setbacks for 1,000 cubic yards per day and 150,000 cubic yards per year					
Scenario 1[a]: mod fugitive dust control, boot on loadout, diesel boiler, generator	87	24hr PM_{10}	Scenario 9[i]: mod fugitive dust control, boot on loadout, nat. gas boiler, generator	72	24hr PM_{10}
Scenario 2[b]: high fugitive dust control, boot on loadout, diesel boiler, generator	67	24hr PM_{10}	Scenario 10[j]: high fugitive dust control, boot on loadout, nat. gas boiler, generator	58	TAPs
Scenario 3[c]: mod fugitive dust control, boot on loadout, diesel boiler, no generator	78	24hr PM_{10}	Scenario 11[k]: mod fugitive dust control, boot on loadout, nat. gas boiler, no generator	67	24hr PM_{10}
Scenario 4[d]: high fugitive dust control, boot on loadout, diesel boiler, no generator	57	24hr PM_{10}	Scenario 12[l]: high fugitive dust control, boot on loadout, nat. gas boiler, no generator	51	24hr PM_{10}
Scenario 5[e]: mod fugitive dust control, baghouse on loadout, diesel boiler, generator	58	TAPs	Scenario 13[m]: mod fugitive dust control, baghouse on loadout, nat. gas boiler, generator	58	TAPs
Scenario 6[f]: high fugitive dust control, baghouse on loadout, diesel boiler, generator	58	TAPs	Scenario 14[n]: high fugitive dust control, baghouse on loadout, nat. gas boiler, generator	58	TAPs
Scenario 7[g]: mod fugitive dust control, baghouse on loadout, diesel boiler, no generator	46	24hr PM_{10}	Scenario 15[o]: mod fugitive dust control, baghouse on loadout, nat. gas boiler, no generator	42	24hr PM_{10}
Scenario 8[h]: high fugitive dust control, boot on loadout, diesel boiler, no generator	34	24hr PM_{10}	Scenario 16[p]: high fugitive dust control, boot on loadout, nat. gas boiler, no generator	34	24hr PM_{10}
Setbacks for 1,500 cubic yards per day and 150,000 cubic yards per year					
Scenario 1[a]: mod fugitive dust control, boot on loadout, diesel boiler, generator	127	24hr PM_{10}	Scenario 9[i]: mod fugitive dust control, boot on loadout, nat. gas boiler, generator	107	24hr PM_{10}

Table 10. SETBACK DISTANCES AS A FUNCTION OF THROUGHPUT AND OPERATIONAL CONFIGURATION.

CBP Configuration Scenario	Setback (m)	Controlling Pollutant	CBP Configuration Scenario	Setback (m)	Controlling Pollutant
Scenario 2[b]: high fugitive dust control, boot on loadout, diesel boiler, generator	103	24hr PM_{10}	Scenario 10[j]: high fugitive dust control, boot on loadout, nat. gas boiler, generator	87	24hr PM_{10}
Scenario 3[c]: mod fugitive dust control, boot on loadout, diesel boiler, no generator	118	24hr PM_{10}	Scenario 11[k]: mod fugitive dust control, boot on loadout, nat. gas boiler, no generator	102	24hr PM_{10}
Scenario 4[d]: high fugitive dust control, boot on loadout, diesel boiler, no generator	92	24hr PM_{10}	Scenario 12[l]: high fugitive dust control, boot on loadout, nat. gas boiler, no generator	78	24hr PM_{10}
Scenario 5[e]: mod fugitive dust control, baghouse on loadout, diesel boiler, generator	73	24hr PM_{10}	Scenario 13[m]: mod fugitive dust control, baghouse on loadout, nat. gas boiler, generator	71	24hr PM_{10}
Scenario 6[f]: high fugitive dust control, baghouse on loadout, diesel boiler, generator	58	TAPs	Scenario 14[n]: high fugitive dust control, baghouse on loadout, nat. gas boiler, generator	58	TAPs
Scenario 7[g]: mod fugitive dust control, baghouse on loadout, diesel boiler, no generator	68	24hr PM_{10}	Scenario 15[o]: mod fugitive dust control, baghouse on loadout, nat. gas boiler, no generator	61	24hr PM_{10}
Scenario 8[h]: high fugitive dust control, boot on loadout, diesel boiler, no generator	52	24hr PM_{10}	Scenario 16[p]: high fugitive dust control, boot on loadout, nat. gas boiler, no generator	38	24hr PM_{10}
Setbacks for 2,500 cubic yards per day and 150,000 cubic yards per year					
Scenario 1[a]: mod fugitive dust control, boot on loadout, diesel boiler, generator	200	24hr PM_{10}	Scenario 9[i]: mod fugitive dust control, boot on loadout, nat. gas boiler, generator	181	24hr PM_{10}
Scenario 2[b]: high fugitive dust control, boot on loadout, diesel boiler, generator	169	24hr PM_{10}	Scenario 10[j]: high fugitive dust control, boot on loadout, nat. gas boiler, generator	159	24hr PM_{10}
Scenario 3[c]: mod fugitive dust control, boot on loadout, diesel boiler, no generator	190	24hr PM_{10}	Scenario 11[k]: mod fugitive dust control, boot on loadout, nat. gas boiler, no generator	169	24hr PM_{10}
Scenario 4[d]: high fugitive dust control, boot on loadout, diesel boiler, no generator	149	24hr PM_{10}	Scenario 12[l]: high fugitive dust control, boot on loadout, nat. gas boiler, no generator	133	24hr PM_{10}
Scenario 5[e]: mod fugitive dust control, baghouse on loadout, diesel boiler, generator	127	24hr PM_{10}	Scenario 13[m]: mod fugitive dust control, baghouse on loadout, nat. gas boiler, generator	102	24hr PM_{10}
Scenario 6[f]: high fugitive dust control, baghouse on loadout, diesel boiler, generator	97	24hr PM_{10}	Scenario 14[n]: high fugitive dust control, baghouse on loadout, nat. gas boiler, generator	81	24hr PM_{10}
Scenario 7[g]: mod fugitive dust control, baghouse on loadout, diesel boiler, no generator	117	24hr PM_{10}	Scenario 15[o]: mod fugitive dust control, baghouse on loadout, nat. gas boiler, no generator	97	24hr PM_{10}
Scenario 8[h]: high fugitive dust control, boot on loadout, diesel boiler, no generator	92	24hr PM_{10}	Scenario 16[p]: high fugitive dust control, boot on loadout, nat. gas boiler, no generator	81	24hr PM_{10}

a. Scenario 1: 95% control on loadout (boot, water, etc); moderate control of fugitives from material handling (+75%); 5 MMBtu/hr diesel boiler; 1,000 kW engine for generator.

b. Scenario 2: 95% control on loadout (boot, water, etc); high control of fugitives from material handling (+95%); 5 MMBtu/hr diesel boiler; 1,000 kW engine for generator.

c. Scenario 3: 95% control on loadout (boot, water, etc); moderate control of fugitives from material handling (+75%); 5 MMBtu/hr diesel boiler; no generator.

d. Scenario 4: 95% control on loadout (boot, water, etc); high control of fugitives from material handling (+95%); 5 MMBtu/hr diesel boiler; no generator.

e. Scenario 5: 99% control on loadout (baghouse); moderate control of fugitives from material handling (+75%); 5 MMBtu/hr diesel boiler; 1,000 kW engine for generator.

Table 10. SETBACK DISTANCES AS A FUNCTION OF THROUGHPUT AND OPERATIONAL CONFIGURATION

CBP Configuration Scenario	Setback (m)	Controlling Pollutant	CBP Configuration Scenario	Setback (m)	Controlling Pollutant

f. Scenario 6: 99% control on loadout (baghouse); high control of fugitives from material handling (+95%); 5 MMBtu/hr diesel boiler; 1,000 kW engine for generator.
g. Scenario 7: 99% control on loadout (baghouse); moderate control of fugitives from material handling (+75%); 5 MMBtu/hr diesel boiler; no generator.
h. Scenario 8: 99% control on loadout (baghouse); high control of fugitives from material handling (+95%); 5 MMBtu/hr diesel boiler; no generator.
i. Scenario 9: 95% control on loadout (boot, water, etc); moderate control of fugitives from material handling (+75%); 5 MMBtu/hr nat gas boiler; 1,000 kW engine for generator.
j. Scenario 10: 95% control on loadout (boot, water, etc); high control of fugitives from material handling (+95%); 5 MMBtu/hr nat gas boiler; 1,000 kW engine for generator.
k. Scenario 11: 95% control on loadout (boot, water, etc); moderate control of fugitives from material handling (+75%); 5 MMBtu/hr nat gas boiler; no generator.
l. Scenario 12: 95% control on loadout (boot, water, etc); high control of fugitives from material handling (+95%); 5 MMBtu/hr nat gas boiler; no generator.
m. Scenario 13: 99% control on loadout (baghouse); moderate control of fugitives from material handling (+75%); 5 MMBtu/hr nat gas boiler; 1,000 kW engine for generator.
n. Scenario 14: 99% control on loadout (baghouse); high control of fugitives from material handling (+95%); 5 MMBtu/hr nat gas boiler; 1,000 kW engine for generator.
o. Scenario 15: 99% control on loadout (baghouse); moderate control of fugitives from material handling (+75%); 5 MMBtu/hr nat gas boiler; no generator.
p. Scenario 16: 99% control on loadout (baghouse); high control of fugitives from material handling (+95%); 5 MMBtu/hr nat gas boiler; no generator.

ATTACHMENT 1

EMISSIONS CALCULATIONS AND MODELING PARAMETERS FOR

DEQ'S AIR IMPACT ANALYSES

CBP Plant Modeled Emissions Rates

Operations should be limited to daily and annual throughputs as selected

Daily production scenarios: < 500 cy/day; < 1,000 cy/day < 1,500 cy/day ; < 2,500 cy/day

Annual production: < 150,000 cy/year

Truck Loadout

Truck loadout emissions were modeled for two different operational scenarios. One scenario involves control of emissions by 95%. This typically involves using a boot loading devise and/or water spray rings. The other scenario involves 100% capture of emissions and control to 99% by a baghouse.

Weigh hopper

Emissions from the weigh hopper are assumed to be captured and controlled to 99% by a baghouse

Boiler

It was assumed a 5 MM Btu/hr boiler would be operated at CBPs. Emissions were modeled using two different operational scenarios. One scenario involves a diesel-fired boiler and the other involves a natural gas-fired boiler. Boiler operations of 24 hours per day and 4,380 hours per year were used to calculate emissions for respective averaging periods.

Cement and Supplement Silo Filling

It was assumed that emissions from silo filling are controlled by a fabric filter. Emissions factors for controlled emissions were used, and it was assumed that a mix of 35% supplement and 55% cement is used in the process.

Power Generator

Emissions were modeled using two different operational scenarios. One scenario involves operating a diesel-fired engine of 1,000 kW rating or less. The other operational scenario does not involve operation of a generator. Emissions estimates were calculated assuming EPA Tier II certification and combustion of 0.0015 wt% sulfur diesel. Generator operations of 24 hours per day and 4,380 hours per year were used to calculate emissions for respective averaging periods.

Aggregate Handling Emissions

Emissions from handling of aggregate and sand were calculated for the following transfers: 1) material to ground storage; 2) material from storage to a receiving hopper; 3) material handling to elevated storage bin.

PM_{10} emissions associated with the handling of aggregate materials were calculated using emissions factors from AP42 Section 13.2.4.

Emissions were calculated using the following emissions equation:

$$E = k(0.0032)\left[\frac{(U/5)^{1.3}}{(M/2)^{1.4}}\right] \quad \text{lb/ton}$$

Where:

k	=	0.35 for PM_{10}
M	=	1.77% for aggregate and 4.17% for sand
U	=	wind speed (mph)

A moisture content of 1.77% for aggregate and 4.17% for sand was used based on defaults suggested for CBPs in AP-42. Emissions were then modified according to supplementary control measures. Two operational scenarios were modeled: 1) assuming additional controls achieve a 75% control; 2) assuming additional controls achieve a 95% control.

In the model, emissions are varied as a function of wind speed, with the base emissions entered for a wind speed of 10 mph.

upper wind speeds for 6 categories: 1.54, 3.09, 5.14, 8.23, 10.8 m/sec

Median wind speed for each category (1 m/sec = 2.237 mph)

Cat 1: (0 + 1.54)/2 = 0.77 m/sec ➢ 1.72 mph
Cat 2: (1.54 + 3.09)/2 = 2.32 m/sec ➢ 5.18 mph
Cat 3: (3.09 + 5.14)/2 = 4.12 m/sec ➢ 9.20 mph
Cat 4: (5.14 + 8.23)/2 = 6.69 m/sec ➢ 14.95 mph
Cat 5: (8.23 + 10.8)/2 = 9.52 m/sec ➢ 21.28 mph
Cat 6: (10.8 + 14)/2 = 12.4 m/sec ➢ 27.74 mph

Base factor for aggregate – use 10 mph wind: $0.35\,(0.0032)\dfrac{(10/5)^{1.3}}{(1.77/2)^{1.4}} = 3.272\text{ E}-3$ lb/ton

Adjustment factors to put in the model:

Cat 1: $(1.72/5)^{1.3}$ (1.329 E-3) = 3.319 E-4 lb/ton
Factor = 3.319 E-4/3.272 E-3 = 0.1014

Cat 2: $(5.18/5)^{1.3}$ (1.329 E-3) = 1.392 E-3 lb/ton
Factor = 1.392 E-3/ 3.272 E-3 = 0.4253

Cat 3: $(9.20/5)^{1.3}$ (1.329 E-3) = 2.936 E-3 lb/ton
Factor = 2.936 E-3/3.272 E-3 = 0.8974

Cat 4: $(14.95/5)^{1.3}$ (1.329 E-3) = 5.519 E-3 lb/ton
Factor = 5.519 E-3/3.272 E-3 = 1.687

Cat 5: $(21.28/5)^{1.3}$ (1.329 E-3) = 8.734 E-3 lb/ton
Factor = 8.734 E-3/3.272 E-3 = 2.669

Cat 6: $(27.74/5)^{1.3}$ (1.329 E-3) = 1.233 E-2 lb/ton
Factor = 1.233 E-2/3.272 E-3 = 3.768

These adjustment factors are the same for emissions from handling sand.

1 yd^3 of concrete ≈ 4024 lbs, consisting of:
1865 lbs aggregate
1428 lbs sand
491 lbs cement
73 lbs supplement
20 gal water

Fraction of aggregate = 1865 lb / 4024 lb = 0.463

Base PM_{10} factor for aggregate handling emissions in terms of lb/yd^3:

$$\frac{3.272\text{ E-3 lb } PM_{10}}{\text{ton agg}} \cdot \frac{0.463\text{ ton agg}}{\text{ton concrete}} \cdot \frac{\text{ton}}{2000\text{ lb}} \cdot \frac{4024\text{ lb conc}}{yd^3} = \frac{3.048\text{ E-3 lb}}{yd^3}$$

Base daily PM_{10} for 1,000 cy/day and 75% supplementary control:

$$\frac{3.048\text{ E-3 lb } PM_{10}}{yd^3} \cdot (1-0.75) \cdot \frac{1000\ yd^3}{\text{day}} \cdot \frac{\text{day}}{24\text{ hour}} = \frac{3.175\text{ E-2 lb}}{\text{hr}}$$

These sources were modeled as two volume sources: 1) material transfers at ground level (2 each of aggregate and sand); 2) material transfers to elevated storage (1 each of aggregate and sand).

CBP Modeling Parameters

Truck Loadout

Scenario 1-4, 9-12 (as indicated in Table 10): fugitive emissions from loading with boot. model as volume source on a 20 m x 20 m x 10 m high building

Release height = 5 meters
Initial dispersion coefficients: σ_{y0} = 20 m / 4.3 = 4.65 m
σ_{z0} = 10 m / 2.15 = 4.65 m

Scenario 5-8, 13-16 (as indicated in Table 10): 100% capture of emissions and release from baghouse stack. Model as point source with the following parameters:

Stack height = 5.0 m; stack diameter = 0.001 meters (to limit momentum plume rise for potential vertical release or capped release); stack gas temperature = 0 K (model will use ambient air temperature for release); flow velocity = 0.001 meters/second (to limit momentum plume rise for potential vertical release or capped release)

Weigh Hopper

Emissions were modeled as a point source with the following parameters:

Stack height = 3.0 m; stack diameter = 1.0 meters (to limit momentum plume rise for potential vertical release or capped release); stack gas temperature = 0 K (model will use ambient air temperature for release); flow velocity = 0.001 meters/second (to limit momentum plume rise for potential vertical release or capped release)

Boiler

Stack parameters are dependent upon the fuel combusted. A combustion evaluation was used to estimate actual stack flow, assuming respective fuel requirements for a 5 MMBtu/hr boiler and a stack gas release temperature of 450 K.

Parameters for the diesel-fired boiler are as follows:

Stack height = 5.0 m; stack diameter = 0.2 meters; stack gas temperature = 450 K; flow velocity = 12.1 meters/second (value needed to achieve a 806 acfm flow rate as indicated by a combustion evaluation)

Parameters for the natural gas-fired boiler are as follows:

Stack height = 5.0 m; stack diameter = 0.3 meters; stack gas temperature = 450 K; flow velocity = 10.48 meters/second (value needed to achieve a 1570 acfm flow rate as indicated by a combustion evaluation)

Cement and Supplement Silo Filling

Emissions were modeled as a point source with the following parameters:

Stack height = 5.0 m; stack diameter = 1.0 meters (to limit momentum plume rise for potential vertical release or capped release); stack gas temperature = 0 K (model will use ambient air temperature for release); flow velocity = 0.001 meters/second (to limit momentum plume rise for potential vertical release or capped release)

Power Generator

Stack gas temperatures and flow rates are often overestimated by permit applicants, likely because values reported by manufacturers are based on values measured at the exhaust manifold rather than at the point of release to the atmosphere. The parameters used in modeling were derived by the following process:

1. The flow for a 1000 kW generator found online was 6907 cfm at 959° F (515° C)(788 K)
2. A reasonably conservative (on the low side) release temperature of 500 K was selected and the acfm flow of 4383 was calculated for the new temperature.
3. A reasonably conservative flow velocity of 25 m/sec was selected, and then a stack diameter of 0.3101 m was calculated (the diameter needed to generate 4000 acfm with a 25 m/sec velocity).

The final point source parameters were as follows:

Stack height = 5.0 m; stack diameter = 0.3101 meters; stack gas temperature = 500 K; flow velocity = 25 meters/second.

Aggregate and Sand to and from Storage

Model as a volume source, released from a 10 m X 10 m area, 3 m high, released at 2 m

Initial dispersion coefficients: σ_{y0} = 10 m / 4.3 = 2.33 m
σ_{z0} = 3 m / 4.3 = 0.7 m

Sources include: two transfers, equivalent in emissions to that of a frontend loader, from the point of aggregate and sand delivery to transfer to the CBP receiving hopper.

Aggregate and Sand to Elevated Storage

Model as a volume source on a building that is 10 m X 10 m X 10 m high. Release height = 5 m

Initial dispersion coefficients: σ_{y0} = 10 m / 4.3 = 2.33 m
σ_{z0} = 10 m / 2.15 = 4.65 m

Sources include: one transfer, equivalent in emissions to that of a frontend loader, to the point of aggregate and sand delivery to elevated storage.

APPENDIX E – FACILITY DRAFT COMMENTS

According to Denise Kohtala of JBR, the permittee's consultant, their were comments from either Wadsworth or JBR regarding the permit and Statement of Basis draft sent March 22, 2010.

APPENDIX F – WADSWORTH APPROVAL OF GENERAL PERMIT CRITERIA

From: Denise Kohtala
To: Eric E. Clark;
Subject: RE: Wadsworh Portable Options
Date: Wednesday, March 10, 2010 9:51:39 AM

Yes that will be fine!

--
Denise Kohtala
JBR Environmental Consultants, Inc.
Office: 801-943-4144 x111
Cell: 801-450-2908
Fax: 801-942-1852
dkohtala@jbrenv.com

From: Eric.Clark@deq.idaho.gov [mailto:Eric.Clark@deq.idaho.gov]
Sent: Wednesday, March 10, 2010 9:51 AM
To: Denise Kohtala
Subject: RE: Wadsworh Portable Options

Denise –

That is great. However, I forgot to add the generators and boiler would be limited to 4380 hr/yr of operation (but you can operate for 24 hrs in a day). Will that still work?

From: Denise Kohtala [mailto:DKohtala@jbrenv.com]
Sent: Wednesday, March 10, 2010 9:46 AM
To: Eric E. Clark
Subject: RE: Wadsworh Portable Options

Eric,

Just spoke with the client and the constraints below will work!

-- Thanks!
Denise Kohtala
JBR Environmental Consultants, Inc.
Office: 801-943-4144 x111
Cell: 801-450-2908
Fax: 801-942-1852
dkohtala@jbrenv.com

From: Eric.Clark@deq.idaho.gov [mailto:Eric.Clark@deq.idaho.gov]
Sent: Wednesday, March 10, 2010 9:32 AM
To: Denise Kohtala

Subject: Wadsworh Portable Options

Denise –

If we assume the following:

75% control of fugitives (standard requirements)
99% Central mix
Use of the generators (can't have a total engine bhp of greater than 1,340)
Use of diesel boiler (max of 5 MMBtu/hr)
Throughput range from 500 to 2500 cy/day and 150,000 cy/yr
Setback range from 192 feet to 419 feet

Please let me know if that will work for them. Thanks

Eric Clark *EIT*
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