Statement of Basis

Concrete Batch Operations General Permit

Mobile Concrete, Inc.
American Falls, Idaho
Facility ID No. 777-00502

EC

Permit to Construct P-2011.0065
Project No. 60791

March 30, 2011
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 **3**
FACILITY INFORMATION **5**
Description 5
Application Scope 5
Application Chronology 5
TECHNICAL ANALYSIS **6**
Emissions Units and Control Devices 6
Emissions Inventories 7
Ambient Air Quality Impact Analyses 11
REGULATORY ANALYSIS **13**
Attainment Designation (40 CFR 81.313) 13
Permit to Construct (IDAPA 58.01.01.201) 13
Tier II Operating Permit (IDAPA 58.01.01.401) 13
Registration Procedures & Requirements for Portable Equipment (IDAPA 58.01.01.500) 13
Visible Emissions (IDAPA 58.01.01.625) 13
Rules For Control of Fugitive Dust (IDAPA 650-651) 13
Rules For Control of Odors (IDAPA 58.01.01.775-776) 13
Title V Classification (IDAPA 58.01.01.300, 40 CFR Part 70) 13
PSD Classification (40 CFR 52.21 and IDAPA 205) 14
NSPS Applicability (40 CFR 60) 14
NESHAP Applicability (40 CFR 61) 18
MACT Applicability (40 CFR 63) 18
CAM Applicability (40 CFR 64) 18
Permit Conditions Review 19
PUBLIC REVIEW **25**
Public Comment Opportunity 25
APPENDIX A – EMISSIONS INVENTORIES
APPENDIX B – PERMIT FEES
APPENDIX C – AMBIENT AIR QUALITY ANALYSIS

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
NSCR	Non-Selective Reduction Catalyst
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
TCEQ	Texas Commission on Environmental Quality
UTM	Universal Transverse Mercator
VOC	volatile organic compounds
$\mu g/m^3$	micrograms per cubic meter

FACILITY INFORMATION

Description

Mobile Concrete, Inc. is a portable truck mix concrete batch plant that consists of the following: aggregate stockpiles, a cement storage silo, a cement supplement (flyash) storage silo, a weigh batcher, conveyors and an electric power supply. The facility combines aggregate, flyash and cement, and transfers the mixture into a truck along with a measured amount of water for in-transit mixing of the concrete. Electrical power will be supplied to the facility by via two electric generators powered by 90 and 180 bhp rated engines. A 2.0 MMBtu/hr heat input rating for the boiler is used to heat the water in cold weather prior to use for the mixing of concrete.

Application Scope

This permit is the initial PTC for a portable Concrete Batch Plant.

Application Chronology

January 31, 2011	A PTC application and combined application and processing fee ($1,500) were received.
February 23, 2011	P-2011.0065 project 60791 application was deemed complete.
March 30, 2011	Final permit and statement of basis were issued.

TECHNICAL ANALYSIS

Emissions Units and Control Devices

Table 1 CONCRETE BATCH PLANT AND CONTROL DEVICE INFORMATION[a]

Emissions Unit Description	Control Device Description	Emissions Discharge Point ID No. and/or Description
Concrete Batch Plant – Truck Mix Manufacturer: CEMCO Model: 220 Maximum capacity: 220 cy/hr Maximum production: 1,000 cy/day and 150,000 cy/year	Cement Storage Silo Baghouse No. 1[c]: Manufacturer: C&W Manufacturing Model: CP-305 8 bags 3' x 1.4' baghouse Cement Supplement Storage Silo Flyash Baghouse No. 2[a]: Manufacturer: C&W Manufacturing Model: CP-305 8 bags 3' x 1.4' baghouse Weigh Batcher Baghouse: Manufacturer: WAM Model: FCIJ03 3 bags 0.43' x 2.08' baghouse Load-out Boot Boot plus cement tube Material Transfer Point Water Sprays or Equivalent Best Management Practices Sprays and other suppressants	Baghouse No. 1 stack Stack height:≥16.4 feet Exit diameter:≥3.28 feet Exit air flow rate: ≥0.003 ft/sec Exit Temperature: Ambient Control efficiency: 99% Baghouse No. 2 stack Stack height:≥16.4 feet Exit diameter: ≥3.28 feet Exit air flow rate: ≥0.003 ft/sec Exit Temperature: Ambient Control efficiency: 99% Weigh Batcher Baghouse: Stack height: ≥9.84 feet Exit diameter:≥3.28 feet Exit air flow rate: ≥0.003 ft/sec Exit Temperature: Ambient Control efficiency: 99% Load-out Boot: Control efficiency: 95% Materials Transfer: Control Efficiency: 75%
Propane boiler (or equivalent[b]) Maximum Rating: 2.0 MMBtu/hr Maximum Fuel Usage: 8,588 gal/yr	None	Stack height: ≥16.4 feet Stack diameter 11.8 inches Exit Velocity: 34.4 ft/sec
Two Diesel Engines (or equivalent[b]) Maximum Rating : 90 bhp Construction Date: 9/27/2006 EPA Certification: 2 Maximum Rating : 180 bhp Construction Date: 10/22/2007 EPA Certification: 3	none	Stack height: ≥16.4 feet Stack diameter 12.2 inches Exit Velocity: 82.0 ft/sec

a. Note that this table is for informational purposes only and the actual operation at the facility may deviate slightly.
b. "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.
c. Both the storage silo baghouse and supplement storage silo flyash baghouse are considered process equipment and therefore there is no associated control efficiency. Controlled PM_{10} emission factors were used when determining PTE and for modeling purposes.

Emissions Inventories

The emissions inventory for this portable concrete batch plant was developed by DEQ and is based on AP-42 Section 11.12 emission factors for central-mix and truck-mix concrete batch plants and the following assumptions: 220 cy per hour concrete production capacity and concrete production limits of 1,000 cy per day and 150,000 cy per year. Baghouse/cartridge filter capture efficiencies were presumed to be 99.0% in DEQ's generic emissions estimation.

The emissions analysis developed by DEQ, at most, assumes one central-mix or truck-mix concrete batch plant, a 2.0 MMBtu/hr diesel-fired boiler and two diesel-fired internal combustion engines (90 and 180 bhp) are used. All possible equipment may not be included the facility specific emissions inventory. Only equipment identified within the application material will be included in the inventory. AP-42 Sections 3.3 and 3.4 (10/96) were used to determine both criteria and TAPs emissions from the diesel-fired engine. AP-42 Section 1.4 (9/98) was used to calculate emissions from the propane boiler.

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%. The assumed 75% control efficiency is based on the Western Regional Air Partnership Fugitive Dust Handbook. According to the Handbook, water suppressant of material handling can range from 50-90% control. Assuming the average of 70% and including another 5% due to Best Management Practices required by the permit allow for 75% control to be a conservative estimate.

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 truck mix load-out emissions are controlled by a boot. Capture efficiency of the truck mix load-out boot or equivalent was estimated at 95%.

Controlled emissions of particulate 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 95% control for truck 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. The hexavalent chromium percentages were taken from a University of North Dakota study, by the Energy and Environmental Research Center, Center for Air Toxic Metals. The two tables listed below compare uncontrolled and controlled emissions. Lead emissions are shown in Table 4. 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*	Hourly Throughput cy/hr	**220**	0.0031	0.682	0.233
Sand delivery to ground storage*	Annual Throughput cy/yr	**150,000**	0.0007	0.154	0.053
Aggregate transfer to conveyor*			0.0031	0.682	0.233
Sand transfer to conveyor*			0.0007	0.154	0.053
Aggregate transfer to elevated storage*			0.0031	0.682	0.233
Sand transfer to elevated storage*			0.0007	0.154	0.053
Cement delivery to Silo (controlled EF because baghouse is process equipment)			0.0001	0.022	0.008
Cement supplement delivery to Silo (controlled EF because baghouse is process equipment)			0.0002	0.044	0.015
Weigh hopper loading (sand & aggregate batcher loading)			0.0040	0.880	0.300
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)			0.0784	17.248	5.880
Total, Point Sources				**18.194**	**6.203**
Total, Process Fugitives				**2.508**	**0.858**

a. The EFs were calculated using EFs in lb/ton of material handled from Table 11.12-2 (6/06), typical composition per cubic yard of concrete (1,865 lb aggregate, 1428 lbs sand, 491 lbs cement, 73 lbs cement supplement, and 20 gallons of water = 4,024 lb/cy), and closely match Table 11.12-5 values (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	0.171	0.058
Sand delivery to ground storage*	75	0.039	0.013
Aggregate transfer to conveyor*	75	0.171	0.058
Sand transfer to conveyor*	75	0.039	0.013
Aggregate transfer to elevated storage*	75	0.171	0.058
Sand transfer to elevated storage*	75	0.039	0.013
Cement delivery to Silo (controlled EF because baghouse is process equipment)	0[a]	0.022	0.008
Cement supplement delivery to Silo (controlled EF because baghouse is process equipment)	0[a]	0.044	0.015
Weigh hopper loading (sand & aggregate batcher loading)	99	0.009	0.003
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)	95	0.862	0.294
Total, Point Sources		**0.937**	**0.32**
Total, Process Fugitives		**0.63**	**0.213**

* Considered fugitive for facility classification purposes.

a. Cement / Cement Supplement Baghouses are considered process equipment

Table 4 LEAD EMISSIONS ESTIMATES UNCONTROLLED/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	5.89E-07[a]	2.58E-06[d]
Cement supplement delivery to Silo (controlled EF because baghouse is process equipment)	5.20E-07	4.18E-06[b]	1.83E-05[d]
Truck load-out*	3.62E-06	1.12E-05[c]	4.92E-05[e]
Total, Point sources		1.60E-05	2.09E-05
Total, Process Fugitives		1.12E-05	4.92E-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 (6/06)

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 (6/06)

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 95% efficiency. The EF is assumed to be uncontrolled. (6/06)

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. (6/06)

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 95% efficiency. The EF is assumed to be uncontrolled. (6/06)

Emissions Inventory for 2.0 MMBtu/hr Boiler

Mobile Concrete, Inc. has a 2.0 MMBtu/hr propane boiler. The boiler will be used on a limited basis and requires an hours of operation limit. The usage is restricted to a maximum of 1,000 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 PROPANE BOILER

Pollutant	**Emissions Factor[a]**	**Emissions[b]**	
	lb/10^3 gal	lb/hr	T/yr
PM_{10}[c]	0.7	0.015	0.007
SO_x[d]	0.015	0.000	0.000
NO_x	13	0.284	0.131
CO	7.5	0.164	0.076
VOC[e]	0.00196	0.000	0.000
Lead[f]	0	0.0000000	0.0000000
Total		**0.463**	**0.214**

a. AP-42 Section 1.3 (9/98) is the source of all emission factors.

b. 91.5 MMBtu/10^3 gal which equated to 2.19E-02 10^3 gal/hr and 1,000 hr/yr was used in the emissions calculation.

c. PM_{10} emission factor assumes the summation of condensable and filterable. Also, it assumed that $PM_{2.5}$ and PM_{10} are equivalent

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 Certified Engines

Emissions are based on a worst-case scenario using diesel fuel in a Tier 2, 90 bhp engine and a Tier 3, 180 bhp engine. The maximum fuel use rate was calculated in gal/hr and was based on the total 270 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.

$$\max fuel = \frac{(rating * BSFC)}{(fuelheatingvalue)} = \frac{(270bhp * 7{,}000Btu/hp-hr)}{(137{,}030Btu/gal)} = 13.79gal/hr$$

Emission factors are derived from one of three sources: 1) If the engine is uncertified, AP-42 factors from Sections 3.3 and 3.4 (10/96) were applied; 2) If the engine is certified as Tier 1-3 or Blue Sky engine, 40 CFR 89 factors were applied; 3) For the more recent Tier 4 engines, 40 CFR 1039 factors were applied.

Table 6 UNCONTROLLED CRITERIA POLLUTANTS FROM 90 & 180 bhp DIESEL ENGINES

Pollutant	Emissions Factor[a]		Emissions	
	lb/MMBtu		lb/hr	T/yr
PM_{10}	0.094	0.047	0.118	0.06
SO_2	0.0015	0.0015	0.003	0.001
NO_x	1.761	1.550	3.063	1.53
CO	1.17	0.82	1.776	0.89
VOC	0.36	0.31	0.617	0.31
Total			**5.58**	**2.79**

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/hp-hr to lb/MMBtu using the following equation: g/hp-hr x (lb/453g) x (hp-hr/7000 Btu) 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 Truck-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(6/06). An average value of wind speed and moisture content are 7 mph and 6%, respectively[1]. The following equation of particulate emissions is specific to PM_{10}. The resulting emissions were used to determine a factor to help evaluate wind speed variations in AERMOD modeling.

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

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

The second transfer emissions calculations were used to determine conveyor emissions. For both coarse and fine aggregate to a conveyor. It was assumed that 82% or 164 cy/hr of the concrete produced was aggregate. This

[1] 7 mph was the average wind speed obtained from an average of 19 Idaho airports throughout the state from 1996-2006. This data is from the Western Regional Climate Center (http://www.wrcc.dri.edu/htmlfiles/westwind.final.html#IDAHO). 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. The percentages used in AP-42 are typical for most concrete batching operations.

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[2]. Employing emission factors from AP-42 Table 11.12-5 (6/06) 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 5 transfer points. Table 8 shows the transfer emissions estimates.

Table 7 TRANSFER POINT EMISSIONS FOR PM_{10}

Pollutant	Emission Factor lb/cy	# of Transfer Pts[a]	Emissions lb/hr	Emissions T/yr
Fine PM_{10}	0.0007	5	0.208	0.0709
Coarse PM_{10}	0.0031	5	1.176	0.4011
Total			**1.384**	**0.472**

a. Transfer points were identified in the application material submitted by the permittee.

Table 8 FACILITY WIDE CRITERIA POLLUTANT EMISSION ESTIMATES

Emissions Unit	PM_{10}	SO_2	NO_x	CO	VOC	Lead
	T/yr	**T/yr**	**T/yr**	**T/yr**	**T/yr**	**T/yr**
Concrete Batch Plant	0.32	--	--	--	--	0.0000
Propane Boiler	0.007	0.000	0.13	0.08	0.00	0.00000
Diesel Fired Engine	0.118	0.00	3.06	1.78	0.62	--
Transfer Points	0.47	--	--	--	--	--
Total	**0.92**	**0.00**	**3.19**	**1.86**	**0.62**	**0.00**

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

Ambient Air Quality Impact Analyses

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 (see Appendix C for details). 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:

Table 9 AMBIENT AIR IMPACT ANALYSIS TRIGGER VALUES

Pollutants	**Averaging Period**	**Trigger Value ($\mu g/m^3$)**
PM_{10}	24-hr	77
	Annual	24
SO_2	3-hr	1266
	24-hr	339
	Annual	72
CO	1-hr	36400
	8-hr	7700
NO_2	Annual	83

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.

[2] The percentages of coarse and fine aggregate are based on the AP-42 concrete composition. One cubic yard of concrete as defined by AP-42 is 4024 total pounds. Similarly, coarse aggregate is 1865 pounds or 46% of the total and sand (fine) aggregate is 1428 pounds or 36%.

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 then calculated. This was the furthest distance between an emissions point and the controlling receptor.

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 so long as the setback distance and other permit conditions are complied with. 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).

REGULATORY ANALYSIS

Attainment Designation (40 CFR 81.313)

Because a separate modeling analysis was not provided to demonstrate compliance with applicable standards in $PM_{2.5}$ and PM_{10} 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 are not applicable to this permitting action.

Registration Procedures & Requirements for Portable Equipment (IDAPA 58.01.01.500)

Portable equipment needs to be registered within 90 days after permit issuance and DEQ must be notified at least 10 days prior to relocation. This requirement is assured by Permit Condition 15.

Visible Emissions (IDAPA 58.01.01.625)

The sources of PM_{10} emissions at this facility are subject to the State of Idaho visible emissions standard of 20% opacity. This requirement is assured by Permit Conditions 7 and 10.

Rules For Control of Fugitive Dust (IDAPA 650-651)

All sources of fugitive dust emissions at the facility are subject to the State of Idaho rules for controlling fugitive dust. Reasonable precautions shall be taken to prevent particulate matter from becoming airborne. This requirement is assured by Permit Condition 6.

Rules For Control of Odors (IDAPA 58.01.01.775-776)

No person shall allow, suffer, cause, or permit the emission of odorous gases, liquids, or solids into the atmosphere in such quantities as to cause air pollution. This requirement is assured by Permit Conditions 11 and 12.

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 synthetic minor facility, because without limits on the potential to emit, the emissions of regulated air pollutants the facility would exceed 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 and IDAPA 205)

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.

(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.

(b) The provisions of this Subpart are not applicable to stationary CI ICE being tested at a stationary CI ICE test cell/stand.

(c) If you are an owner or operator of an area source subject to this Subpart, you are exempt from the obligation to obtain a permit under 40 CFR part 70 or 40 CFR part 71, provided you are not required to obtain a permit under 40 CFR 70.3(a) or 40 CFR 71.3(a) for a reason other than your status as an area source under this Subpart. Notwithstanding the previous sentence, you must continue to comply with the provisions of this Subpart applicable to area sources.

(d) Stationary CI ICE may be eligible for exemption from the requirements of this Subpart as described in 40 CFR part 1068, Subpart C (or the exemptions described in 40 CFR part 89, Subpart J and 40 CFR part 94, Subpart J, for engines that would need to be certified to standards in those parts), except that owners and operators, as well as manufacturers, may be eligible to request an exemption for national security.

The 90 bhp IC engine was constructed, modified or reconstructed on September 27, 2006, which is after July 11, 2005. The 180 bhp IC engine was constructed, modified or reconstructed on October 22, 2007, which also is after July 11, 2005. Therefore, both engines are subject to the Subpart.

As the general permit was being developed 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 to comply with 40 CFR 1068.30, it was concluded to require Subpart IIII for all engines regardless of time at a given location. To eliminate permitting complexity, all applicants that choose the general permit have been required to comply with Subpart IIII.

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

The Permittee 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?

The Permittee 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?

The Permittee 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.

The Subpart requires that the Permittee comply with Table 1 of IIII if the engine is pre-2007 and has a displacement of less than 10 liters/cylinder. However, this permit requires that the Permittee comply with 40 CFR 89.112 or 40 CFR 139 where applicable. All of those standards are equal to or more stringent than Table 1 of this Subpart. Also, if the engine or engines are non-certified, per the Subpart they have to demonstrate compliance with Table 1 and the hours of operations are reduced. If the engines have a model year of 2007 or greater they too must meet and certify that their 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.

§ 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?

The Permittee is not using the IC engine 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.

The Permittee must operate the IC engine 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 non-road diesel fuel.

The Permittee 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. All emissions calculations assume that percentage throughout the PTC.

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

(a) After December 31, 2008, owners and operators may not install stationary CI ICE (excluding fire pump engines) that do not meet the applicable requirements for 2007 model year engines.

(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.

(c) After December 31, 2014, owners and operators may not install non-emergency stationary CI ICE with a maximum engine power of greater than or equal to 19 KW (25 HP) and less than 56 KW (75 HP) that do not meet the applicable requirements for 2013 model year non-emergency engines.

(d) After December 31, 2013, owners and operators may not install non-emergency stationary CI ICE with a maximum engine power of greater than or equal to 56 KW (75 HP) and less than 130 KW (175 HP) that do not meet the applicable requirements for 2012 model year non-emergency engines.

(e) After December 31, 2012, owners and operators may not install non-emergency stationary CI ICE with a maximum engine power of greater than or equal to 130 KW (175 HP), including those above 560 KW (750 HP), that do not meet the applicable requirements for 2011 model year non-emergency engines.

(f) After December 31, 2016, owners and operators may not install non-emergency stationary CI ICE with a maximum engine power of greater than or equal to 560 KW (750 HP) that do not meet the applicable requirements for 2015 model year non-emergency engines.

(g) In addition to the requirements specified in §§60.4201, 60.4202, 60.4204, and 60.4205, it is prohibited to import stationary CI ICE with a displacement of less than 30 liters per cylinder that do not meet the applicable requirements specified in paragraphs (a) through (f) of this section after the dates specified in paragraphs (a) through (f) of this section.

The Permittee is installing a 2006 and 2007 model engine that meets the applicable requirements for that model year.

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

The Permittee 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?

The Permittee 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?

(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.

The Permittee is subject to both 60.4204(a) and 60.4204(b), therefore the engine must be installed and configured according to the manufacturer's specifications. 60.4204(a) requires that the engine meet emissions standards identified in Table 1 of the subpart. All emission calculations used for this general permit factor in all emission standards for the applicable engine and certification. Similarly, 60.4204(b) requires that engines manufactured in 2007 and beyond meet the standards identified in 40 CFR 89 and 1039. Again, all emission calculations used for the general permit incorporate these standards into the determination. 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?

A Performance test on the IC engines is not required and therefore this requirement is not applicable to the Permittee and the 90 and 180 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?

A Performance test on the IC engine is not required and the engine is less than 30 liters per cylinder. Therefore this requirement is not applicable to the Permittee and the 90 and 180 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?

(a) Owners and operators of non-emergency stationary CI ICE that are greater than 2,237 KW (3,000 HP), or have a displacement of greater than or equal to 10 liters per cylinder, or are pre-2007 model year engines that are greater than 130 KW (175 HP) and not certified, must meet the requirements of paragraphs (a)(1) and (2) of this section.

(c) If the stationary CI internal combustion engine is equipped with a diesel particulate filter, the owner or operator must keep records of any corrective action taken after the backpressure monitor has notified the owner or operator that the high backpressure limit of the engine is approached.

The applicable IC engine does not meet the criteria set forth in the Subpart requiring notification unless it is uncertified, greater than 175 bhp and was reconstructed or modified on or after July 11, 2005. All engines are less than 3,000 HP and have a displacement less than 10 liters per cylinder.

All engines that are uncertified and constructed reconstructed or modified prior to July 11, 2005 are subject to 40 CFR 63, Subpart ZZZZ. Therefore section (a) of the requirement is not applicable. However, section (c) does apply only if the engine is equipped with a diesel particulate filter.

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

The applicable IC engine is 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?

The applicable IC engine is 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?

The applicable IC engine is not using any special fuels. Therefore this requirement is not applicable.

NESHAP Applicability (40 CFR 61)

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

MACT Applicability (40 CFR 63)

This Concrete Batch plant does not emit or have the potential to emit more than 10 tons or more per year of any HAP, or 25 tons or more per year of any combination of HAPs. Major source Maximum Achievable Control Technology (MACT) requirements therefore do not apply to this facility.

Area source MACT requirements that would apply to the IC engines include Subpart ZZZZ:

40 CFR 63, Subpart ZZZZ.....National Emission Standards for Hazardous Air Pollutants for Reciprocating Internal Combustion Engines

§ 63.6585 Am I subject to this Subpart?

You are subject to this Subpart if you own or operate a stationary RICE at a major or area source of HAP emissions, except if the stationary RICE is being tested at a stationary RICE test cell/stand.

(a) A stationary RICE is any internal combustion engine which uses reciprocating motion to convert heat energy into mechanical work and which is not mobile. Stationary RICE differ from mobile RICE in that a stationary RICE is not a non-road engine as defined at 40 CFR 1068.30, and is not used to propel a motor vehicle or a vehicle used solely for competition.

(c) An area source of HAP emissions is a source that is not a major source.

All engines used with this general CBP plant are subject to 40 CFR 63, Subpart ZZZZ as they are all stationary engines operating at a HAP emissions area source. HAP emissions are defined under section 112(b) of the Clean Air Act. Diesel IC engines emit several of the pollutants listed in the section and are therefore consider HAP emissions sources.

However, a source may be exempt from Subpart ZZZZ if the engine(s) requires compliance with 40 CFR 60, Subpart IIII. Section 40 CFR 63.6590(c) states that an engine that is subject to Subpart IIII, is therefore in compliance with Subpart ZZZZ.

(c) Stationary RICE subject to Regulations under 40 CFR Part 60. An affected source that is a new or reconstructed stationary RICE located at an area source, or is a new or reconstructed stationary RICE located at a major source of HAP emissions and is a spark ignition 2 stroke lean burn (2SLB) stationary RICE with a site rating of less than 500 brake HP, a spark ignition 4 stroke lean burn (4SLB) stationary RICE with a site rating of less than 250 brake HP, or a 4 stroke rich burn (4SRB) stationary RICE with a site rating of less than or equal to 500 brake HP, a stationary RICE with a site rating of less than or equal to 500 brake HP which combusts landfill or digester gas equivalent to 10 percent or more of the gross heat input on an annual basis, an emergency or limited use stationary RICE with a site rating of less than or equal to 500 brake HP, or a compression ignition (CI) stationary RICE with a site rating of less than or equal to 500 brake HP, must meet the requirements of this part by meeting the requirements of 40 CFR part 60 Subpart IIII, for compression ignition engines or 40 CFR part 60 Subpart JJJJ, for spark ignition engines. No further requirements apply for such engines under this part.

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). To minimize setback distances the sulfur content may not exceed 15 ppm standard for use of this general CBP permit when using diesel fuel. However, the boiler used by Mobile Concrete only operates on propane gas.

Permit Condition 4.

This condition identifies the allowable fuels that may be combusted in the engine(s). 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). Also, the inclusion of the minimum cetane index and maximum aromatic content is in accordance with 40 CFR 80.510(b).

Fuel Monitoring and Recordkeeping

Permit Condition 5.

The permittee needs to maintain documentation each time fuel is received to demonstrate compliance with the sulfur content limitation.

Fugitive Dust Control

Permit Condition 6.

This condition requires that the permittee perform visible emissions checks on see/no see basis to verify that fugitive emissions are not extending beyond the property boundary. If visible emissions are seen, corrective action must be taken. Reasonable control requirements for fugitive dust are needed at any potential site. Permit conditions requires that the plant must take corrective action where practical to control fugitive dust when operating.

Permit Condition 7.

More fugitive dust control is required by implementing 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. The methods provided in this condition are options that the permittee may use to control any dust problems.

Fugitive Dust Control Monitoring & Recordkeeping

Permit Condition 8.
Requires the permittee to conduct inspections each day that the plant is operating to assess the control of fugitive emissions and specifies corrective actions to take if fugitive dust is not reasonably controlled.

Opacity

Permit Condition 9.

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

Visible Emissions Monitoring & Recordkeeping

Permit Condition 10.

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 must be performed in accordance to IDAPA 58.01.01.130-136. Records of all inspections need to be maintained as well.

Odors

Permit Condition 11.

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

Permit Condition 12.

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

Nonattainment Areas

Permit Condition 13.

The concrete batch plant cannot relocate and operate in any nonattainment area. Operations within a nonattainment area were not included in the modeling compliance analysis. Therefore, it is not permitted with this general CBP permit. See the associated modeling memo.

Co-location

Permit Condition 14.

The concrete batch plant may only co-locate with one (1) rock crushing facility. Co-location is defined as being within 1,000 ft of the nearest emission unit. This includes the concrete batch plant, silos and the center of any stockpile.

Reporting Requirements

Permit Condition 15.

When relocating to another site, the permittee must submit a Portable Equipment Relocation Form (PERF) within 10 days of desired moving date in accordance with IDAPA 58.01.01.500. A scaled plot must also be included with the PERF form.

Subpart A General Provisions

Permit Condition 16.

This set of general provisions applies because the engine(s) associated with the CBP is an affected source in accordance with 40 CFR 60, Subpart IIII Standards of Performance for Stationary Compression Ignition Internal Combustion Engines.

Incorporation by Reference

Permit Condition 17.

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 18.

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

Permit Condition 19.

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

Operating Requirements

Permit Condition 20.

Limits the finished concrete production and required setback for any future site. A setback distance from the property boundary was used in the ambient air quality impact analysis to demonstrate compliance with NAAQS and TAP increments. Because the equipment is portable and the location may be changed from its initial location, compliance with a minimum 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 an average of 12 hours per day is also included in the determination.

One of the biggest drivers when establishing the setback distances was truck loadout. It is accepted by the DEQ that a boot enclosure alone provides 95% control. This acceptance is based on several previously issued permits that demonstrated through manufacturer information. To increase the flexibility of the general permit and allow for small setback distances the permittee has the option to increase the loadout control to 99%. The permittee can increase the control efficiency to 99% in one of two ways; either 1) route all loadout emissions to a baghouse or 2) equip the boot enclosure with a water-fog-ring spray system. A BACT analysis done by the Texas Commission of Environmental Quality (TCEQ) in 2006 suggested that the appropriate control efficiency for the water ring was 85%. Multiply (1-95%) and (1-85%) returns a value of .0075. 1- .0075 = .9925 or 99.25%. Therefore adding the water fog ring to the boot enclosure obtains 99% control efficiency for truck loadout.

The fugitive dust control ranges from 75% to 95%. The additional 20% is obtained by mandating the enclosing of aggregate/sand piles with three-sided barriers and covering piles or adding additional suppressants.

Setback distances of both line power and engine use are included in the condition. This allows for the facility to move from one site that requires an engine for power to another site in which line power is available without requiring a permit revision.

To allow for even more flexibility, AERMOD modeling was conducted to establish a scenario in which no setback distance is required. This requires that all Idaho TAPs emissions levels in IDAPA 58.01.01.585 and 586 are never exceeded. Benzene and POM from the natural gas boiler are the drivers when both loadout and fugitive dust control is maximized at 99% and 95% respectively. Other requirements are that only line power and a natural gas boiler are allowed.

Permit Condition 21.

This condition requires that all operations may only occur during daylight hours and for a maximum of 12 hours each day. This was added to limit the setback distance in Permit Condition 20.

Permit Condition 22.

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 2 MMBtu/hr maximum boiler and running 4,380 hr/yr. AP-42 Section 1.3 (9/98) assumes 1,020 MMBtu/10^3 gal which equates to $1.96e^{-03}/10^3$ gal/hr for a 2 MMBtu/hr boiler. That hourly rate is multiplied by 4,380 hr/yr to 8,588 gal fuel per year.

Permit Condition 23.

A baghouse filter/cartridge system must be installed on any storage silo 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 24.

A water spray bar or equivalent 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 25.

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 review. This is to demonstrate that all required control equipment is being operated and maintained properly. Also any change whether it is done by the facility or requested by DEQ must be submitted to DEQ within 15 days of the change.

Permit Condition 26.

Truck loadout emissions must be controlled to a minimum of 95% efficiency. This is achieved by requiring a shroud or boot enclosure.

Monitoring & Recordkeeping Requirements

Permit Condition 27.

Concrete production monitoring is required daily, monthly and annually. This is necessary to demonstrate compliance with the production limits.

Permit Condition 28.

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. Also, atmospheric characteristics must be documented to verify that assumed emission factors during the analysis to accurate for the location of the plant.

Permit Condition 29.

Each month the boiler's fuel usage needs to be recorded and summed for the previous consecutive 12 months to demonstrate compliance with the annual fuel limit.

Compression Ignition Internal Combustion Engines

Process Description

Permit Condition 30.

This condition provides a brief synopsis of the engine(s) used by the facility.

Operating Requirements

Permit Condition 31.

This condition states that the facility must install and operate an IC engine that is tier certified and that documentation stating such is maintained onsite.

Permit Condition 32.

This condition states that the facility must install and operate an IC engine that is tier certified and that documentation stating such is maintained onsite.

Permit Condition 33.

This condition is included to limit the engine(s) to use that equates to the emissions produced by a 90 bhp, Tier 2 engine operating 1,000 hours/yr and a 180 bhp, Tier 3 also operating 1,000 hours/yr. All calculated hours assume that each engine is operating 24 hours/day.

Monitoring & Recordkeeping

Permit Condition 34.

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.

NSPS 40 CFR 60, Subpart IIII Requirements

Operating Requirements

Permit Condition 35.

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 sections 60.4206 and 60.4211(a).

Permit Condition 36.

If the engine is equipped with a particulate filter, it must be installed with a backpressure monitor in accordance with 40 CFR 60, Subpart IIII, specifically section 60.4209.

Monitoring & Recordkeeping

Permit Condition 37.

Records of any corrective action must be maintained when the backpressure monitor notifies the operator that a high backpressure limit has been approached. This condition is in accordance with 40 CFR 60.4214(c).

General Provisions

General Compliance

Permit Condition 38.

The duty to comply general compliance provision requires that the permittee comply with all of the permit terms and conditions pursuant to Idaho Code §39-101.

Permit Condition 39.

The maintenance and operation general compliance provision requires that the permittee maintain and operate all treatment and control facilities at the facility in accordance with IDAPA 58.01.01.211.

Permit Condition 40.

The obligation to comply general compliance provision specifies that no permit condition is intended to relieve or exempt the permittee from compliance with applicable state and federal requirements, in accordance with IDAPA 58.01.01.212.01.

Inspection & Entry

Permit Condition 41.

The inspection and entry provision requires that the permittee allow DEQ inspection and entry pursuant to Idaho Code §39-108.

Construction & Operation Notification

Permit Condition 42.

The construction and operation notification provision requires that the permittee notify DEQ of the dates of construction and operation, in accordance with IDAPA 58.01.01.211.

Performance Testing

Permit Condition 43.

The performance testing notification of intent provision requires that the permittee notify DEQ at least 15 days prior to any performance test to provide DEQ the option to have an observer present, in accordance with IDAPA 58.01.01.157.03.

Permit Condition 44.

The performance test protocol provision requires that any performance testing be conducted in accordance with the procedures of IDAPA 58.01.01.157, and encourages the permittee to submit a protocol to DEQ for approval prior to testing.

Permit Condition 45.

The performance test report provision requires that the permittee report any performance test results to DEQ within 30 days of completion, in accordance with IDAPA 58.01.01.157.04-05.

Monitoring & Recordkeeping

Permit Condition 46.

The monitoring and recordkeeping provision requires that the permittee maintain sufficient records to ensure compliance with permit conditions, in accordance with IDAPA 58.01.01.211.

Excess Emissions

Permit Condition 47.

The excess emissions provision requires that the permittee follow the procedures required for excess emissions events, in accordance with IDAPA 58.01.01.130.

Certification

Permit Condition 48.

The certification provision requires that a responsible official certify all documents submitted to DEQ, in accordance with IDAPA 58.01.01.123.

False Statements

Permit Condition 49.

The false statement provision requires that no person make false statements, representations, or certifications, in accordance with IDAPA 58.01.01.125.

Tampering

Permit Condition 50.

The tampering provision requires that no person render inaccurate any required monitoring device or method, in accordance with IDAPA 58.01.01.126.

Transferability

Permit Condition 51.

The transferability provision specifies that this permit to construct is transferable, in accordance with the procedures of IDAPA 58.01.01.209.06.

Severability

Permit Condition 52.

The severability provision specifies that permit conditions are severable, in accordance with IDAPA 58.01.01.211.

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

Final Concrete Batch Plant Emissions Inventory

Listed Below are the emissions estimates for the units selected.

Company:	Mobile Concrete
Facility ID:	777-00502
Permit No.:	P-2011.0065 Proj 60791
Source Type:	Portable Concrete Batch Plant
Manufacturer/Model:	Comeco 220

Production

Maximum Hourly Production Rate:	220	cy/hr
Proposed Daily Production Rate:	1000	cy/day
Proposed Maximum Annual Production Rate:	150000	cy/year

Tons/year

Emissions Units		$PM_{2.5}$	PM_{10}	SO_2	NO_x	CO	VOC	Lead	THAPs
CBP Type:	Truck Mix	0.113	0.32	NA	NA	NA	NA	2.09E-05	
Water Heater/Boiler:	2 MMBtu/hr Propane	0.008	0.008	0.000	0.142	0.082	0.011	0.00E+00	
Diesel Engine*:	90 bhp, Tier 2, 180 bhp, Tier 3 Engines	0.06	0.06	0.00	1.53	0.89	0.31	NA	
	Transfer/Drop Points	0.147	0.47	NA	NA	NA	NA	NA	
	Totals	0.33	0.85	0.00	1.67	0.97	0.32	2.09E-05	1.39E-03

Pounds/hour

		$PM_{2.5}$	PM_{10}	SO_2	NO_x	CO	VOC	Lead	THAPs
CBP Type:	Truck Mix	0.026	0.07	NA	NA	NA	NA	1.60E-05	
Water Heater/Boiler:	2 MMBtu/hr Propane	0.015	0.015	0.000	0.284	0.164	0.022	0.00E+00	
Diesel Engine*:	180 bhp, Tier 2, 0 bhp, uncertified engines	0.12	0.12	0.00	3.06	1.78	0.62	NA	
	Transfer/Drop Points	1.956	0.26	NA	NA	NA	NA	NA	
	Totals	2.12	0.47	0.00	3.35	1.94	0.64	1.60E-05	5.97E-04

* The Large engine may run : There is no large engine. hr/yr
* The Small engine(s) may run 1000 hr/yr

HAPS & TAPS Emissions Inventory

Metals	HAP	TAP	lb/hr	T/yr	Averaging Period	EL lb/hr	Exceeded?
Arsenic	X	X	1.38E-06	6.03E-06	Annual	1.50E-06	No
Barium		X	0.00E+00	0.00E+00	24-hour	3.30E-02	No
Beryllium	X	X	1.17E-07	5.14E-07	Annual	2.80E-05	No
Cadmium	X	X	2.27E-08	9.93E-08	Annual	3.70E-06	No
Cobalt	X	X	0.00E+00	0.00E+00	24-hour	3.30E-03	No
Copper		X	0.00E+00	0.00E+00	24-hour	1.30E-02	No
Chromium	X	X	1.95E-05	1.59E-05	24-hour	3.30E-02	No
Manganese	X	X	3.98E-05	6.76E-05	24-hour	3.33E-01	No
Mercury	X	X	0.00E+00	0.00E+00	24-hour	3.00E-03	No
Molybdenum		X	0.00E+00	0.00E+00	24-hour	2.70E-05	No
Nickel	X	X	4.47E-06	1.96E-05	Annual	2.70E-05	No
Phosphorus	X	X	5.88E-05	5.03E-05	24-hour	7.00E-03	No
Selenium	X	X	1.65E-06	2.97E-06	24-hour	1.30E-02	No
Vanadium		X	0.00E+00	0.00E+00	24-hour	3.00E-03	No
Zinc		X	0.00E+00	0.00E+00	24-hour	6.67E-01	No
Chromium VI	X	X	8.39E-07	3.68E-06	Annual	5.60E-07	Yes
Non PAH Organic Compunds							
Pentane		X	0.00E+00	0.00E+00	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	5.52E-05	2.42E-04	Annual	3.00E-03	No
Acrolein	X	X	2.91E-05	2.91E-05	24-hour	1.70E-02	No
Benzene	X	X	6.71E-05	2.94E-04	Annual	8.00E-04	No
1,3 - Butadiene	X	X	2.81E-06	1.23E-05	Annual	2.40E-05	No
Ethyl Benzene	X	X	0.00E+00	0.00E+00	24-hour	29	No
Formaldehyde	X	X	8.49E-05	3.72E-04	Annual	5.10E-04	No
Hexane	X	X	0.00E+00	0.00E+00	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	1.29E-04	1.29E-04	24-hour	25	No
o-Xylene	X	X	8.98E-05	8.98E-05	24-hour	7.00E-03	No
PAH HAPs							
2-Methylnaphthalene	X	X	0.00E+00	0.00E+00	Annual	9.10E-05	No
3-Methylchloranthrene	X	X	0.00E+00	0.00E+00	Annual	2.50E-06	No
7,12-Dimethylbenz(a)anthracene	X		0.00E+00	0.00E+00	NA	NA	NA
Acenaphthene	X	X	1.02E-07	4.47E-07	Annual	9.10E-05	No
Acenaphthylene	X	X	3.64E-07	1.59E-06	Annual	9.10E-05	No
Anthracene	X	X	1.34E-07	5.89E-07	Annual	9.10E-05	No
Benzo(a)anthracene	X	X	1.21E-07	5.29E-07	Annual	9.10E-05	No
Benzo(a)pyrene	X	X	1.35E-08	5.92E-08	Annual	2.00E-06	No
Benzo(b)fluoranthene	X	X	7.13E-09	3.12E-08	Annual	2.00E-06	No
Benzo(e)pyrene	X	X	0.00E+00	0.00E+00	Annual	2.00E-06	No
Benzo(g,h,i)perylene	X	X	3.52E-08	1.54E-07	Annual	9.10E-05	No
Benzo(k)fluoranthene	X	X	1.11E-08	4.88E-08	Annual	2.00E-06	No
Chrysene	X	X	2.54E-08	1.11E-07	Annual	2.00E-06	No
Dibenzo(a,h)anthracene	X	X	4.19E-08	1.84E-07	Annual	2.00E-06	No
Dichlorobenzene	X	X	0.00E+00	0.00E+00	Annual	9.10E-05	No
Fluoranthene	X	X	5.47E-07	2.40E-06	Annual	9.10E-05	No
Fluorene	X	X	2.10E-06	9.20E-06	Annual	9.10E-05	No
Indeno(1,2,3-cd)pyrene	X	X	2.70E-08	1.18E-07	Annual	2.00E-06	No
Naphthalene	X	X	6.10E-06	2.67E-05	24-hour	3.33	No
Naphthalene	X	X	0.00E+00	0.00E+00	24-hour	9.10E-05	No
Perylene	X		0.00E+00	0.00E+00	NA	NA	NA
Phenanathrene	X	X	2.11E-06	9.26E-06	Annual	9.10E-05	No
Pyrene	X	X	3.44E-07	1.51E-06	Annual	9.10E-05	No
Polycyclic Organic Matter (POM)	X	X	2.47E-07	1.08E-06	Annual	2.00E-06	No

Total HAPs Emissions:	5.97E-04	1.39E-03	3.72E-04

APPENDIX B – PERMIT FEES

All associated permitting fees were paid when the application was submitted. The total cost of the Concrete Batch General Permit is $1,500. That includes a $1,000 application fee and $500 processing fee.

Per Section 224 of the Rules, all PTC applications are subject to an application fee of $1000.
Per Section 225 of the Rules, General PTC permits are subject to a processing fee of $500. The definition of General permit per the Rules: "no facility-specific requirements (defined as a source category specific permit for which the Department has developed standard emission limitations, operating requirements, monitoring and recordkeeping requirements, and that require minimal engineering analysis. General permit facilities may include portable concrete batch plants, portable hot-mix asphalt plants and portable rock crushing plants.)"

APPENDIX C – AMBIENT AIR QUALITY ANALYSIS

MEMORANDUM

DATE: March 28, 2011

TO: Eric Clark, Air Program

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

PROJECT: P-2011.0065 PROJ 60791 PTC Application for the Mobile Concrete, Inc., portable concrete batch plant

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

1.0 Summary

Mobile Concrete, Inc. (Mobile Concrete) submitted a Permit to Construct (PTC) application for their portable concrete batch plant (CBP) proposed to be operated in Idaho. Non-site-specific air quality impact analyses involving atmospheric dispersion modeling of emissions associated with the CBP were performed by DEQ to demonstrate that the facility 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]). Mobile Concrete submitted applicable information and data enabling DEQ to perform non-site-specific ambient air impact analyses.

DEQ performed non-site-specific air quality impact analyses to assure compliance with air quality standards for the proposed Mobile Concrete CBP. Results from DEQ's atmospheric dispersion modeling were used to establish minimum setback distances between emissions points and the ambient air boundary of the site (typically 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 criteria pollutant concentrations from emissions associated with the facility, when appropriately combined with background concentrations, were below applicable National Ambient Air Quality Standards (NAAQS) at all locations outside of the required setback distance (closest distance from pollutant emissions points to the ambient air boundary); showed that impacts of Toxic Air Pollutants (TAPs) were below applicable increments at all locations outside of the required setback distances. 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 information, 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 key conditions in Table 1 are representative of facility design capacity or operations as limited by a federally enforceable permit condition.

Table 1. KEY CONDITIONS USED IN MODELING ANALYSES	
Criteria/Assumption/Result	**Explanation/Consideration**
Maximum concrete throughput does not exceed 1,000 yd^3/day and 150,000 yd^3/year.	Short-term and annual modeling was performed assuming these rates.
Maintain a 174 meter (571 foot) setback distance between emissions points and the nearest ambient air boundary. If generators are not operated the required setback is 59 meters (194 feet).	This setback distance is necessary to assure compliance with applicable air quality standards, primarily 1-hour NO_2.
The CBP will not locate to a site where there are co-contributing emissions sources such as other CBPs, hot mix asphalt plants, or rock crushing plants within 305 meters (1,000 feet) of emissions points, except as noted below for a rock crushing plant. However, NAAQS compliance is assured for the CBP with a co-contributing rock crushing plant, provided it is not operated during any day when the CBP is operated and the annual actual throughput of the rock crushing plant is less than 500,000 ton/year.	Emissions are considered co-contributing if they occur within 305 meters (1,000 feet) of each other. Once the CBP is established at a specific site, that facility is not responsible for controlling other facilities from moving in nearby, provided they are not on the same property. Neighboring facilities would be required to account for the CBP impacts for their permitting analyses.
DEQ Modeling staff determined that NAAQS compliance is assured for a CBP operating simultaneously (both within a given day) with a crushing plant, provided CBP daily throughput for that day is limited to half that normally allowed.	Decreased CBP throughput will offset potential impacts of a nearby crushing plant.
Diesel engine powering a generator: powered by engine rated at ≤180 bph; is EPA Tier 3 Certified or better; operates up to12 hours/day during daylight hours only.	Different combinations can be used if it is demonstrated that total emissions from generators are less than those modeled for this source.
Diesel engine powering a generator: powered by engine rated at ≤90 bph; is EPA Tier 2 Certified or better; operates up to12 hours/day during daylight hours only.	Different combinations can be used if it is demonstrated that total emissions from generators are less than those modeled for this source.
Fugitive emissions from aggregate/sand handling and vehicle traffic are controlled to a moderate degree.	Control of aggregate/sand transfers and handling are controlled by over 75% from base conditions of 1.77% moisture content for aggregate and 4.17% moisture content for sand.
The batch plant may not locate in any non-attainment areas.	All analyses performed assumed the facility will be located in areas attaining air quality standards.
Emissions rates for applicable averaging periods are not greater than those used in the modeling analyses, as listed in this memorandum.	Established setback distances may increase if emissions used in the impact analyses were increased.
Stack heights for the generators, boiler, and baghouses are as listed in this memorandum or higher.	NAAQS compliance is still assured if actual stack heights are greater than those listed in this memo.
NAAQS compliance is assured provided stack parameters of exhaust temperature and flow rate are not less than about 75 percent of values listed in this memorandum.	Higher temperatures and flow rates increase plume rise, allowing the plume to disperse to a larger degree before impacting ground level.

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 facility exceed the significant impact levels (SILs) of Idaho Air Rules Section 006 (referred to as a significant contribution in Idaho Air Rules), then a cumulative NAAQS impact analysis is necessary to demonstrate compliance with 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 SILs and specifies the modeled value that must be used for comparison to the NAAQS.

New NO_2 and SO_2 short-term standards have recently been promulgated by EPA. The standards will be applicable for permitting purposes in Idaho when they are incorporated by reference sine die into Idaho Air Rules (Spring 2011). The analyses performed accounted for the new standards.

DEQ used non-site-specific full impact analyses to demonstrate compliance with Idaho Air Rules Section 203.02. Established setback distances are minimal distances between any emissions points and the ambient air boundary (usually the property boundary) needed to assure compliance with standards, considering the impact of the CBP, any co-contributing sources, 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 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 total project-wide emissions increase of any TAP 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.

Table 2. APPLICABLE REGULATORY LIMITS				
Pollutant	**Averaging Period**	**Significant Impact Levels[a] ($\mu g/m^3$)[b]**	**Regulatory Limit[c] ($\mu g/m^3$)**	**Modeled Value Used[d]**
PM_{10}[e]	24-hour	5.0	150[f]	Maximum 6th highest[g]
$PM_{2.5}$[h]	Annual	0.3	15[i]	Mean of maximum 1st highest[j]
	24-hour	1.2	35[k]	Mean of maximum 1st highest[j]
Carbon monoxide (CO)	8-hour	500	10,000[l]	Maximum 2nd highest[m]
	1-hour	2,000	40,000[l]	Maximum 2nd highest[m]
Sulfur Dioxide (SO_2)	Annual	1.0	80[n]	Maximum 1st highest[m]
	24-hour	5	365[l]	Maximum 2nd highest[m]
	3-hour	25	1,300[l]	Maximum 2nd highest[m]
	1-hour	3 ppb[o] (7.8 $\mu g/m^3$)	75 ppb[p] (196 $\mu g/m^3$)	Mean of maximum 4th highest[q]
Nitrogen Dioxide (NO_2)	Annual	1.0	100[n]	Maximum 1st highest[m]
	1-hour	4 ppb[o] (7.5 $\mu g/m^3$)	100 ppb[r] (188 $\mu g/m^3$)	Mean of maximum 8th highest[s]
Lead (Pb)	Quarterly	NA	1.5[n]	Maximum 1st highest[m]
	3-month[t]	NA	0.15[n]	Maximum 1st highest[m]

a. Idaho Air Rules Section 006 (definition for significant contribution).
b. Micrograms per cubic meter.
c. Incorporated into Idaho Air Rules by reference, as per Idaho Air Rules Section 107.
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. Never expected to be exceeded more than once in any calendar year.
g. Concentration at any modeled receptor when using five years of meteorological data.
h. Particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers.
i. 3-year average of annual concentration.
j. Mean (of 5 years of data) of the maximum of 1st highest maximum modeled concentrations at any modeled receptor for each year of meteorological data modeled.
k. 3-year average of the upper 98th percentile of 24-hour concentrations.
l. Not to be exceeded more than once per year.
m. Concentration at any modeled receptor.
n. Not to be exceeded in any calendar year.
o. Interim SIL established by EPA policy memorandum.
p. 3-year average of the upper 99th percentile of the distribution of maximum daily 1-hour concentrations.
q. Mean (of 5 years of data) of the maximum of 4th highest daily 1-hour maximum modeled concentrations for each year of meteorological data modeled.
r. 3-year average of the upper 98th percentile of the distribution of maximum daily 1-hour concentrations.
s. 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.
t. 3-month rolling average.

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 for all pollutants except 1-hour NO_2.

Background concentrations, other than $PM_{2.5}$, 1-hour NO_2, and 1-hour SO_2, 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 for all pollutants except for $PM_{2.5}$ and 1-hour averaged NO_2.

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

Background $PM_{2.5}$ concentrations were based on monitoring performed in Idaho in small town or rural areas. Certain areas with elevated concentrations because of unique situations were excluded from this assessment. Unique situations include periodic impacts from forest fires and areas where the meteorology combines with the topography to frequently cause stagnant air conditions. The monitoring 24-hour design value was used for each location where monitoring data were considered. The design value is the 98th percentile of the 24-hour monitored values. Where more than one year of monitoring data were available, the average of the 98th percentile value was used for up to three of the most recent years.

The final 24-hour background value used was the mean value from all locations assessed. The same general method was used for the annual $PM_{2.5}$ background, except the design value is the maximum annual average monitored value and the background was taken as the mean of all locations plus two times the standard deviation. A value of two times the standard deviation was not added to the 24-hour mean value. DEQ determined use of the mean value was adequately conservative because: 1) the maximum modeled value at each receptor was used as the design value rather than the 5-year average of the 8th highest for each year; 2) the low probability that conditions causing the high background levels on a given day will coincide with days associated with the high modeled concentrations.

Background concentrations for 1-hour NO_2 were based on monitoring data collected between January 2009 and June 2010, in Meridian, Idaho. A separate background value was used for each hour of the day, based on the 2nd highest value monitored for that hour. Hourly 1-hour NO_2 background concentrations are given in Table 4.

Table 3. BACKGROUND CONCENTRATIONS

Pollutant	Averaging Period	Background Concentration ($\mu g/m^3$)[a]
PM_{10}[b]	24-hour	73
$PM_{2.5}$[c]	24-hour	21.3
	Annual	10.1
Carbon monoxide (CO)	1-hour	3,600
	8-hour	2,300
Sulfur dioxide (SO_2)	1-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.
c. Particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 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.

Table 4. BACKGROUND 1-HOUR NO_2 CONCENTRATIONS					
Hour	Concentration ($\mu g/m^3$)[a]	Hour	Concentration ($\mu g/m^3$)[a]	Hour	Concentration ($\mu g/m^3$)[a]
1	50.0	9	54.9	17	58.4
2	49.8	10	51.5	18	61.8
3	45.7	11	54.9	19	70.4
4	48.4	12	48.1	20	85.9
5	56.7	13	41.2	21	84.1
6	54.9	14	44.6	22	75.5
7	56.7	15	48.1	23	63.5
8	63.5	16	48.1	24	49.8

a. Micrograms per cubic meter.

3.1.1 Overview of Analyses

The proposed project is a portable CBP, including the use of portable diesel-fired generators.

DEQ performed non-site-specific analyses that were determined to be reasonably representative of the proposed CBP, and the results demonstrated compliance with applicable air quality standards to DEQ's satisfaction.

Because of the portable nature of the CBP, DEQ performed non-site-specific modeling to establish setback distances between locations of emissions points and the ambient air boundary of the CBP. Setback distances were established for two scenarios: 1) the CBP operating with diesel generators providing power; 2) the CBP operating without diesel generators.

Table 5 provides a brief description of parameters used in the DEQ modeling analyses.

Table 5. 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 09292.
Meteorological Data	Multiple Data Sets	See Section 3.1.4.
Terrain	Flat	The analyses assumed flat terrain for the immediate area.
Building Downwash	Considered	Downwash was accounted for the generator structures and a trailer mounted office.
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 rather than the applicant. 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 locations of emissions points and the ambient air boundary for the plant.

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. 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 to evaluate impacts of the CBP.

AERMOD did not have a post processor to calculate the 1-hour NO_2 design value at the time these analyses were performed. The modeling design value for each modeled receptor is the 5-year mean of the 98^{th} percentile of maximum daily 1-hour NO_2 concentrations. To enable the design value to be calculated, DEQ set AERMOD to write post files of 1-hour concentrations for each hour and each receptor. DEQ then ran the NO_2 post processor NO2Post, available from Oris BEE-Line software, to calculate design values for each receptor location.

DEQ also set AERMOD to use the Plume Volume Molar Ratio Method (PVMRM) program to better account for NO/NO_2/ozone chemistry. Section 3.1.4 provides a description of parameters and data used for PVMRM.

3.1.4 Data and Parameters used for Modeling 1-Hour NO_2 with PVMRM

PVMRM was used with AERMOD to provide a more refined estimate of 1-hour NO_2 concentrations at specific receptors. Table 6 lists the data and parameters used for PVMRM. Hourly ozone data was used in PVMRM to estimate the conversion of NO to NO_2. Ozone data from the 2007 study, *Ozone and its Precursors in the Treasure Valley, Idaho*, were used for modeling (Final Report, May 2008, Desert Research Institute). Hourly data from Parma, Idaho, were collected from June 27, 2007 through October 12, 2007. These data were sorted by hour and then the mean and standard deviation was calculated for each hour across all days. For each hour modeled, a background ozone value equal to the mean plus one standard deviation was used as input to PVMRM. This method is fairly conservative because it does not account for seasonal variation in ozone concentrations, and the Parma data were collected during the time of year when maximum ozone concentrations are expected.

An NO_2/NOx ratio for NOx emissions is also used in PVMRM. NO_2/NOx ratios for the generator engines were calculated using a method established in Texas Natural Resource Conservation Commission (TNRCC) rules for Permits by Rule for Turbines and Engines (Chapter 106, subchapter W, §106.511, §106.512).

Table 6. PARAMETERS AND DATA FOR PVMRM		
Parameter	**Value**	**Source/Comments**
NO_2/NOx ratio for Emissions	0.3176 for 180 bhp engine; 0.2394 for 90 bhp engine; 0.2 for boiler	based on guidance from Texas.
Ambient Equilibrium for NO_2/NOx	0.90	default value
Ozone Concentrations	Value specified for each hour modeled	based on values from Parma, Idaho, during a 2007 ozone study

3.1.5 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 7 lists the meteorological data sets used in the air impact analyses.

Table 7. METEOROLOGICAL DATA SETS USED IN MODELING ANALYSES		
Surface Data	**Upper Air Data**	**Years**
Boise	Boise	2001-2005
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 2nd high modeled concentration to evaluate compliance with the 24-hour PM_{10} standard, rather than the maximum of 6th 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 1st high modeled concentration to evaluate compliance with all pollutants and averaging times, except for 24-hour PM_{10} and 1-hour NO_2.

- The standard design value was used for 1-hour NO_2. The design value is the 5-year average of the 98th percentile of the annual distribution of maximum 1-hour modeled concentrations.

3.1.6 Terrain Effects

Terrain effects on dispersion were not considered in the non-site-specific analyses. Assuming flat terrain is not a critical limitation of the analyses because most emissions points 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.

3.1.7 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 and equipment. 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.

3.1.8 Building Downwash

Downwash effects caused by the trailer-mounted office were accounted for by using a 6 meter by 6 meter structure, 4.1 meters high, in the model. Downwash effects caused by the generator housing were accounted for by including the two generator structures as a building with dimensions of 3.0 meter by 2.0 meter by 2.0 meter high.

Downwash effects from other structures at the site were not accounted for because of the following:

- Determining a building configuration is extremely difficult given the portable nature of the facility.
- Much of the equipment is porous with regard to wind, thereby minimizing downwash effects.

3.1.9 Ambient Air Boundary

DEQ's non-site-specific analyses, using a generic facility layout, were used to generate minimum setback distances between emissions points and the property boundary or the established boundary to ambient air (if not the same as the property boundary). Ambient air is any area where the general public (anyone not under direct control of the plant) has access. The issued permit will specify throughput restrictions and an emissions point setback from ambient air.

3.1.10 Receptor Network and Generation of Setback Distances

Setback distances were determined by first modeling the plant using a dense receptor grid. Results were then reviewed to find the receptor furthest from any emissions source that shows an exceedance of the standard when combined with a background value. The setback distance was calculated as the maximum distance between the next furthest receptor and any emissions point.

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

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 $\mu g/m^3$
$PM_{2.5}$	24-hour	13.7 $\mu g/m^3$
	annual	4.9 $\mu g/m^3$
SO_2	1-hour	162 $\mu g/m^3$
	24-hour	339 $\mu g/m^3$
	annual	72 $\mu g/m^3$

CO	1-hour	36400 $\mu g/m^3$
	8-hour	7700 $\mu g/m^3$
NO_2	1-hour	variable background value
	annual	83 $\mu g/m^3$

Background values that vary by hour of day were used for 1-hour NO_2 modeling. Background was added to NO_2 modeling values within the NO2POST program, so final concentration values included background. Therefore, the trigger value used for 1-hour NO2 was the 188 $\mu g/m^3$ standard.

2) For the operational configuration, 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.

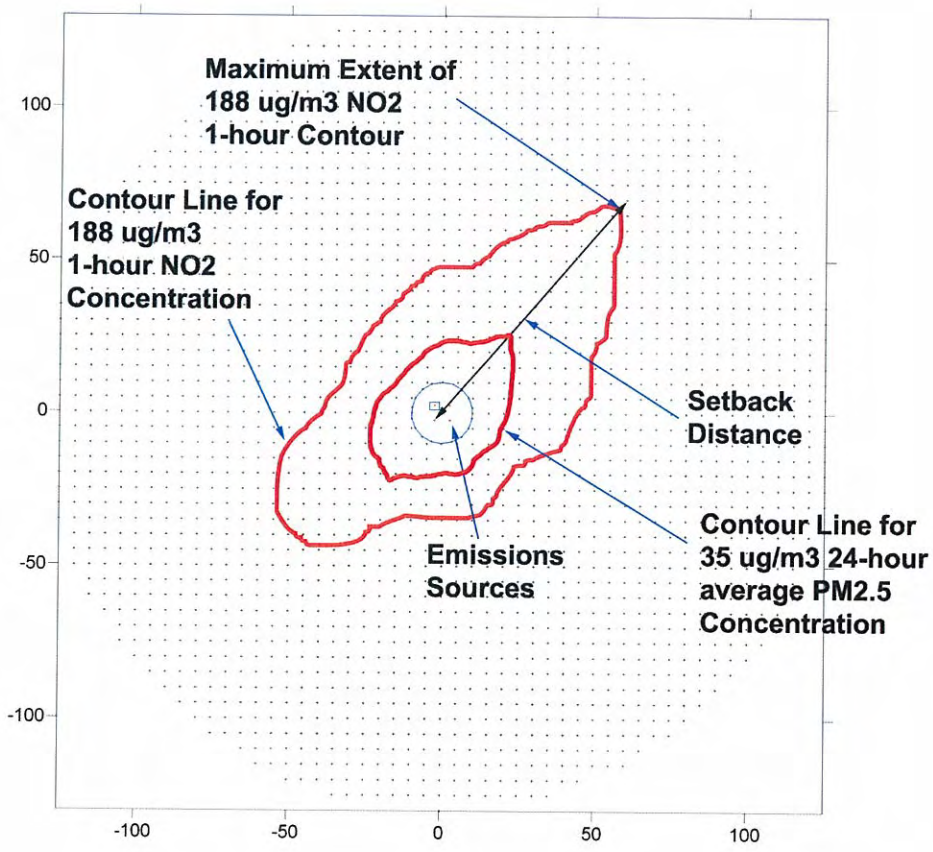
4) The minimum setback distance was calculated. This was the furthest distance between an emissions point and the controlling receptor.

Figure 1 shows an example of how setback distances are determined for a specific modeling run. Emissions points are grouped in a cluster at the center within a 5.0 meter square area. The inner contour line shows the extent of modeled concentrations exceeding the 24-hour $PM_{2.5}$ NAAQS. The outer-most contour line shows modeled 1-hour NO_2 design value concentrations that exceed the NAAQS. The point on the contour line that is the furthest from the emissions points is identified, and then the controlling receptor is identified as the next furthest receptor beyond that point. The setback distance is determined from the coordinates of the controlling receptor according to the following (with the center of the emissions sources group at 0.0 m Northing and 0.0 m Easting):

$$\text{Distance} = \sqrt{(|\text{Northing Coordinate}| + 3)^2 + (|\text{Easting Coordinate}| + 3)^2}$$

The factor of 3 in the equation accounts for an emissions point located on the opposite side of the facility center from where the maximum impact is (at -2.5 meters Easting, -2.5 meters Northing if the maximum setback distance is in the direction of positive easting and northing coordinates).

Figure 1 - Determination of Setback Distance for a Modeling Run



3.2 Emission Rates

Emissions rates of criteria pollutants and TAPs were calculated for the proposed CBP production rate and operational configuration for various applicable averaging periods.

3.2.1 Criteria Pollutant Emissions Rates

Table 8 lists criteria pollutant emissions rates used in the DEQ non-site-specific modeling analyses for the CBP production rate, operational configuration, and for all applicable averaging periods. Attachment 1 provides additional details of DEQ emissions calculations used in the modeling analyses.

Fugitive particulate emissions from handling of aggregate materials for the CBP plant were designated as emissions point AGG&SND and AGGTOSTO in the model to account for transfers at near ground-level and transfers to elevated storage, respectively. Two ground-level transfers were included for the source: 1) transfer of aggregate and sand from truck unloading to a storage pile; 2) transfer of aggregate and sand from the storage pile to a hopper. One transfer was included for aggregate and sand transfer to elevated

storage. Emissions rates are a function of wind speed and were varied in the model according to wind speed. Attachment 1 provides details on emissions calculations for wind speed categories.

Table 8. EMISSIONS USED IN DEQ ANALYSES

Emissions Point in Model	Pollutant	Averaging Period	Emissions Rate (lb/hr)
			220 cy/hr[a] 1,000 cy/day 150,000 cy/yr
NGBOILER – propane boiler ≤ 2 MMbtu/hr	PM_{10}/ $PM_{2.5}$	24-hour	0.02235
		Annual	0.02235
	CO	1-hour 8-hour	0.2471
	SO_2	1-hour	0.004412
		24-hour	0.004412
		Annual	0.004412
	NOx	1-hour	0.2941
		Annual	0.2941
SILO – cement storage silo	$PM_{2.5}$	24-hour	0.001519
		Annual	0.0006243
	PM_{10}	24-hour	0.003478
SUPSILO – cement supplement storage silo	$PM_{2.5}$	24-hour	0.002030
		Annual	0.0008344
	PM_{10}	24-hour	0.007454
WEIGHOP – aggregate weigh hopper loading. - controlled by baghouse	$PM_{2.5}$	24-hour	0.0002493
		annual	0.0001025
	PM_{10}	24-hour	0.001646
TRUCKLOD – truck loadout. - controlled by boot	$PM_{2.5}$	24-hour	0.02938
		Annual	0.01208
	PM_{10}	24-hour	0.1633
GEN1 – electrical generator - 180 hp diesel engine - 12 hr/day, 1,000 hr/yr - 0.0015% sulfur diesel - Tier 3 certified	$PM_{2.5}$	24-hour	0.05917
		Annual	0.01081
	PM_{10}	24-hour	0.05917
	CO	1-hour 8-hour	1.033
	SO_2	1-hour	0.002184
		24-hour	0.002184
		Annual	0.0003989
	NOx	1-hour	1.183
		Annual	0.2161
GEN2 – electrical generator - 90 hp diesel engine - 12 hr/day, 1,000 hr/yr - 0.0015% sulfur diesel - Tier 2 certified	$PM_{2.5}$	24-hour	0.05917
		Annual	0.01081
	PM_{10}	24-hour	0.05917
	CO	1-hour 8-hour	0.7398
	SO_2	1-hour	0.001092
		24-hour	0.001092
		Annual	0.0001995
	NOx	1-hour	1.109
		Annual	0.2026
AGG&SAND[b] – aggregate/sand handling at ground level	$PM_{2.5}$	24-hour	0.01185
		Annual	0.004869
	PM_{10}	24-hour	0.07824
AGGTOSTO[b] – aggregate/sand to elevated storage	$PM_{2.5}$	24-hour	0.005923
		Annual	0.002434
	PM_{10}	24-hour	0.03912

a. Cubic yards of concrete per hour, day, or year.

b. Emissions are varied in the model according to wind speed category. Emissions listed are based on a 10 mph wind speed.

3.2.2 TAP Emissions Rates

Operation of the proposed CBP will result in an increase in allowable emissions of TAPs. Table 9 lists the increase in TAPs for the proposed plant. Table 10 is a summary of TAP emissions and a comparison to the applicable ELs. Modeling was required for arsenic and chromium 6+ since emissions exceeded the ELs.

Table 9. TAP EMISSIONS USED IN DEQ ANALYSES

Emissions Point in Model	Pollutant	Averaging Period	Emissions for 150,000 ton HMA/yr (lb/hr)
NGBOILER – propane boiler < 3 MMbtu/hr	Arsenic	period	9.132E-7
	Cadmium	period	6.849E-7
	Chromium 6+	period	0.0
	Nickel	period	6.849E-7
	Benzene	period	4.790E-8
	Formaldehyde	period	7.387E-6
	POM	period	2.614E-9
	PAH (naphthalene)	period	2.529E-7
SILO – cement storage silo	Arsenic	period	1.782E-8
	Cadmium	period	2.043E-9
	Nickle	period	1.757E-7
	Chromium 6+	period	2.438E-8
SUPSILO – cement supplement storage silo	Arsenic	period	6.250E-7
	Cadmium	period	1.238E-8
	Nickle	period	1.425E-6
	Chromium 6+	period	2.288E-7
TRUCKLOD – truck loadout. - controlled by boot	Arsenic	period	7.342E-7
	Cadmium	period	8.257E-9
	Nickle	period	2.873E-6
	Chromium 6+	period	5.861E-7
GEN1[b] – electrical generator	Benzene	period	6.710E-5
	Formaldehyde	period	8.486E-5
	POM	period	3.234E-7
	PAH (naphthalene)	period	9.349E-6
GEN2[b] – electrical generator	Benzene	period	1.342E-4
	Formaldehyde	period	1.697E-4
	POM	period	6.468E-7
	PAH (naphthalene)	period	1.870E-5

a. Based on allowable throughput of 150,000 cy/year.

b. Assumes 800 hr/year of actual operation (daytime 12 hr/day operation only).

Table 10. SUMMARY OF FACILITY-WIDE TAP EMISSIONS USED FOR MODELING

TAP	Averaging Period	Emissions	EL	Modeling Required (> EL)
Arsenic	period	2.290E-6	1.5E-6	Yes
Benzene	period	2.013E-4	8.0E-4	No
Cadmium	period	7.076E-7	3.7E-6	No
Chromium 6+	period	8.393E-7	5.6E-7	Yes
Formaldehyde	period	2.619E-4	5.1E-4	No
Nickel	period	5.159E-6	2.7E-5	No
PAH(naphthalene)	period	2.830E-5	9.1E-5	No
POM	period	9.728E-7	2.0E-6	No

3.3 Emission Release Parameters and Plant Criteria

Table 11 lists the characteristics of the Mobile Concrete CBP used in DEQ's non-site-specific air impact analyses.

Table 12 provides emissions release parameters for the analyses including stack height, stack diameter, exhaust temperature, and exhaust velocity. Additional details are provided in Attachment 1.

Table 11. CHARACTERISTIC OF HMA PLANT USED IN DEQ ANALYSES

Parameter	Value or Description
Concrete Throughput Rates	220 cy/hr, 1,000 cy/day, 150,000 cy/yr
Co-Contributing Sources	The emissions points of the CBP are not located within 1,000 feet of other permittable emissions sources. A rock crushing plant could be operated at the site provided it is not operated during any day when the CBP is operated and annual throughput is less than 500,000 ton/yr. Alternatively, a rock crusher could be operated simultaneously (both operating in a given day) with the CBP provided the CBP throughput for that day does not exceed a value of half that otherwise allowed.
Cement and Supplement Storage Silo	Emissions captured and controlled by a baghouse
Silo Stack Parameters	Stack height ≥5.0 m, stack diameter ≈ 1 m.
Aggregate Weigh Hopper Loading Stack Parameters	Stack height ≥3.0 m, stack diameter ≈ 1 m.
Hot Water Boiler	Stack height ≥5.0 m, stack diameter ≈ 0.3 m, gas temp ≥450 K, flow velocity ≥10.5 m/sec.
Electrical Power	Line power or diesel-fired generators with the following characteristics: 1) a large generator powered by an engine less than 180 bhp, EPA Tier 3 Certified, burning 0.0015% sulfur fuel, operating less than 12 hr/day during daylight hours only; 2) a small generator powered by a engine of less than 90 bhp, EPA Tier 2 Certified, burning 0.0015% sulfur fuel, operating less than 12 hr/day during daylight only. Other generators or combination of generators can be used provided emissions are not greater than those modeled for these sources.
Large Generator Stack Parameters	Stack height ≥4.6 m, stack diameter ≈ 0.12 m, gas temp ≥700 K, flow velocity ≥45 m/sec.
Small Generator Stack Parameters	Stack height ≥4.6 m, stack diameter ≈ 0.09 m, gas temp ≥700 K, flow velocity ≥45 m/sec.
Frontend Loader Transfers at ground level	≤2 transfers for any given quantity of material processed. Typically involves: 1) aggregate and sand to storage pile; 2) aggregate and sand from pile to hopper. Assume a moderate level of emissions control.
Aggregate/Sand Transfers to Elevated Storage	≤1 transfers for any given quantity of material processed. Assume a moderate level of emissions control.

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 proposed operating scenario, criteria pollutant and TAP, and averaging period. Setback distances are the closest distance between the ambient air boundary and the emissions release point of any emissions source (silo baghouse vent, weigh hopper loading baghouse stack, boot controlled truck loadout, boiler stack, or aggregate bins). Setback distances to assure compliance with 1-hour NO_2 were by far the most controlling for the scenario of operating diesel generators, with a 174 meter setback needed. When diesel generators are not operated at the CBP site, a setback of only 59 meters is needed to assure compliance, with 24-hour $PM_{2.5}$ driving the result.

Table 12. EMISSIONS RELEASE PARAMETERS					
Release Point /Location	**Source Type**	**Stack Height (m)[a]**	**Modeled Diameter (m)**	**Stack Gas Temp. (K)[b]**	**Stack Gas Flow Velocity (m/sec)[c]**
NGBOILER	Point	5.0	0.3	450	10.5
SILO	Point	5.0	1.0	Ambient	0.001[d]
SUPSILO	Point	5.0	1.0	Ambient	0.001[d]
WEIGHOP	Point	3.0	1.0	Ambient	0.001[d]
GEN1	Point	4.57	0.12	700	44.6
GEN2	Point	4.57	0.085	700	44.6
Volume Sources					
Release Point /Location	**Source Type**	**Release Height (m)**	**Initial Horizontal Dispersion Coefficient σ_{y0} (m)**	**Initial Vertical Dispersion Coefficient σ_{z0} (m)**	
AGG&SAND	Volume	2.0	2.33	0.70	
AGGTOSTO	Volume	5.0	1.40	1.91	
TRUCKLOD	Volume	5.0	1.40	1.91	

a. Meters
b. Kelvin
c. Meters per second
d. Set at 0.001 to minimize plume vertical momentum because of a raincapped or horizontal release.

3.5 Locating with Other Facilities/Equipment

The air impact analyses performed by DEQ assume there are no other emissions sources in the immediate area that measurably contribute to pollutant concentrations in a way not adequately accounted for by the background concentrations used. Such emissions sources could include a rock crushing plant, a hot mix asphalt plant, another CBP, or other permitted facility. DEQ modeling staff established a rule-of-thumb distance of 1,000 feet from emissions sources at the CBP where emissions from a nearby facility would need to be considered in the air impact analyses for the CBP. Emissions sources located beyond 1,000 feet are considered to be too distant to have a measureable impact on receptors substantially impacted by the CBP.

CBPs commonly co-locate with rock crushing plants. Since the 1-hour NO_2, followed by 24-hour PM_{10} and $PM_{2.5}$ impacts, are the governing criteria for the Mobile Concrete CBP (governing for criteria pollutants – contributions of TAPs from other facilities are not considered in permitting analyses for the CBP), simultaneously operation on an annual basis is not a large concern. DEQ modeling staff determined NAAQS compliance is still assured when a rock crushing plant co-locates with the CBP, provided the CBP does not operate during any day when the rock crushing plant is operating and the annual actual throughput of the rock crushing plant is not greater than 500,000 tons. DEQ modeling staff also determined NAAQS compliance is assured when operating the CBP during the same day as the rock crushing plant, provided the throughput of the CBP is half that assumed for the modeling analyses used to generate setback distances for the scenario of no co-location.

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 ambient air quality standard.

ATTACHMENT 1

EMISSIONS CALCULATIONS AND MODELING PARAMETERS FOR

DEQ'S AIR IMPACT ANALYSES

CBP Modeled Emissions Rates

Setback requirements are linked to throughput levels and the equipment configuration.

Power Generator

The application indicated two diesel engines may be operated at the CBP to power electrical generators: 1) an EPA Tier 3 certified 180 bhp diesel engine operating up to 12 hr/day during daylight hours only; 2) an EPA Tier 2 certified 90 bhp diesel engine operating up to 12 hr/day during daylight hours only. Emissions estimates were calculated assuming the engines will combust diesel with a maximum 0.0015% sulfur content. Emissions were modeled as occurring only between 6 am and 6 pm; 0.0 lb/hr was modeled for other time periods.

Emissions for 180 bhp Tier 3 EPA Certified diesel engine: $PM_{2.5}$, PM_{10}, and NOx emissions based on emissions standards in 40 CFR 85:

PM assumed to be equal to $PM_{2.5}$ and PM_{10}, 130 ≤ kW ≤ 560, PM = 0.20 g/kW-hr

hourly

$$\frac{0.20\ g\ PM_{10},\ PM_{2.5}}{kW - hr} \left| \frac{kW}{1.341\ hp} \right| \frac{180\ hp}{} \left| \frac{lb}{453.59\ g} \right| = \frac{0.05917\ lb}{hr}$$

annual

$$\frac{0.05917\ lb\ PM_{10},\ PM_{2.5}}{hr} \left| \frac{800\ hr}{4380\ hr} \right| = \frac{0.01081\ lb}{hr}$$

NOx equal to, 130 ≤ kW ≤ 225, NOx = 4.0 g/kW-hr

hourly

$$\frac{4.0\ g\ NOx}{kW - hr} \left| \frac{kW}{1.341\ hp} \right| \frac{180\ hp}{} \left| \frac{lb}{453.59\ g} \right| = \frac{1.183\ lb}{hr}$$

annual

$$\frac{1.183\ lb\ NOx}{hr} \left| \frac{800\ hr}{4380\ hr} \right| = \frac{0.2161\ lb}{hr}$$

SO_2 emissions are based on the sulfur content of the fuel and were calculated according to the factor in Table 3.4-1 of AP-42: 8.09E-3S lb SO_2 / hp-hr, where S is the percent sulfur in the fuel

hourly

$$\frac{8.09E\text{-}3\ (0.0015)\ lb}{hp - hr} \left| \frac{180\ hp}{} \right| = \frac{0.002184\ lb}{hr}$$

annual

$$\frac{0.002184\ lb\ SO_2}{hr} \left| \frac{800\ hr}{4380\ hr} \right| = \frac{0.0003989\ lb}{hr}$$

Emissions for 90 bhp Tier II EPA Certified diesel engine. $PM_{2.5}$, PM_{10}, and NOx emissions based on emissions standards in 40 CFR 85:

PM assumed to be equal to PM_{10} and $PM_{2.5}$, 37 ≤ kW ≤ 75 , PM = 0.40 g/kW-hr

hourly

$$\frac{0.40\text{ g } PM_{10},\ PM_{2.5}}{\text{kW - hr}} \left| \frac{\text{kW}}{1.341\text{ hp}} \right| \frac{90\text{ hp}}{} \left| \frac{\text{lb}}{453.59\text{ g}} \right. = \frac{0.05917\text{ lb}}{\text{hr}}$$

annual

$$\frac{0.05917\text{ lb } PM_{10}}{\text{hr}} \left| \frac{800\text{ hr}}{4380\text{ hr}} \right. = \frac{0.01081\text{ lb}}{\text{hr}}$$

HMHC + NOx assumed to be equal to NOx, 37 ≤ kW ≤ 75, NOx = 7.5 g/kW-hr

hourly

$$\frac{7.5\text{ g NOx}}{\text{kW - hr}} \left| \frac{\text{kW}}{1.341\text{ hp}} \right| \frac{90\text{ hp}}{} \left| \frac{\text{lb}}{453.59\text{ g}} \right. = \frac{1.109\text{ lb}}{\text{hr}}$$

annual

$$\frac{1.109\text{ lb NOx}}{\text{hr}} \left| \frac{800\text{ hr}}{4380\text{ hr}} \right. = \frac{0.2026\text{ lb}}{\text{hr}}$$

SO_2 emissions are based on the sulfur content of the fuel and were calculated according to the factor in Table 3.4-1 of AP-42: 8.09E-3S lb SO_2 / hp-hr, where S is the percent sulfur in the fuel

hourly

$$\frac{8.09\text{E-3 (0.0015) lb}}{\text{hp - hr}} \left| \frac{90\text{ hp}}{} \right. = \frac{0.001092\text{ lb}}{\text{hr}}$$

annual

$$\frac{0.001092\text{ lb } SO_2}{\text{hr}} \left| \frac{800\text{ hr}}{4380\text{ hr}} \right. = \frac{0.0001995\text{ lb}}{\text{hr}}$$

Aggregate and Sand Handling Emissions

Emissions from aggregate and sand handling were calculated for the following transfers: 1) ground level transfers including transfers to a storage pile and transfers to the CBP hopper; 2) transfers to elevated storage.

PM_{10} and $PM_{2.5}$ 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} and 0.053 for $PM_{2.5}$
M	=	1.77% for aggregate and 4.17% for sand
U	=	wind speed (mph)

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

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

Median windspeed 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 $PM_{2.5}$ factor for aggregate – use 10 mph wind:

$$0.053\,(0.0032)\frac{(10/5)^{1.3}}{(1.77/2)^{1.4}} = 4.955\ E-3 \quad lb/ton$$

PM_{10} emissions were calculated in the same manner but are not presented here.

Adjustment factors to put in the model:

Cat 1: $(1.72/5)^{1.3}$ (2.012 E-4) = 5.026 E-5 lb/ton
Factor = 5.026 E-5 / 4.955 E-4 = 0.1014

Cat 2: $(5.18/5)^{1.3}$ (2.012 E-4) = 2.107 E-4 lb/ton
Factor = 2.107 E-4 / 4.955 E-4 = 0.4253

Cat 3: $(9.20/5)^{1.3}$ (2.012 E-4) = 4.446 E-4 lb/ton
Factor = 4.446 E-4 / 4.955 E-4 = 0.8974

Cat 4: $(14.95/5)^{1.3}$ (2.012 E-4) = 8.358 E-4 lb/ton
Factor = 8.358 E-4 / 4.955 E-4 = 1.687

Cat 5: $(21.28/5)^{1.3}$ (2.012 E-4) = 1.323 E-3 lb/ton
Factor = 1.323 E-3 / 4.955 E-4 = 2.669

Cat 6: $(27.74/5)^{1.3}$ (2.012 E-4) = 1.867 E-3 lb/ton
Factor = 1.867 E-3 / 4.955 E-4 = 3.768

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

Fraction of aggregate = 1865 lb / 4024 lb = 0.4635

Base $PM_{2.5}$ factor for aggregate in terms of lb/yd^3

$$\frac{4.955\ E-4\ lb\ PM_{2.5}}{ton} \left| \frac{0.4635\ ton\ agg}{ton\ concrete} \right| \frac{ton}{2000\ lb} \left| \frac{4024\ lb\ conc.}{yd^3} \right. = \frac{4.621\ E-4\ lb\ PM_{2.5}}{yd^3}$$

Assume moderate fugitive dust controls reduce emissions by an additional 75%.
Base controlled PM_{10} factor in terms of lb/yd^3

$$\frac{4.621\text{ E-4 lb } PM_{2.5}}{yd^3} \mid (1\text{-}0.75) = \frac{1.155\text{ E-4 lb } PM_{2.5}}{yd^3}$$

Using the same process for sand handling, the $PM_{2.5}$ controlled emissions factor is 2.665 E-5 lb $PM_{2.5}$/yd^3

There are two ground level transfers of aggregate and sand: 1) transfer to a storage pile; 2) transfer from a pile to the hopper.

For the operational scenario for 1,000 cy/day concrete and 150,000 cy/year concrete, $PM_{2.5}$ emissions from aggregate and sand transfers at ground level are as follows:

Daily $PM_{2.5}$:

$$\frac{1.155\text{ E-4 lb} + 2.665\text{ E-5 lb}}{yd^3\text{ - transfer}} \mid \frac{2\text{ transfers}}{} \mid \frac{1000\ yd^3}{day} \mid \frac{day}{24\text{ hour}} = \frac{0.01185\text{ lb } PM_{2.5}}{hr}$$

Annual $PM_{2.5}$:

$$\frac{1.155\text{ E-4 lb} + 2.665\text{ E-5 lb}}{yd^3\text{ - transfer}} \mid \frac{2\text{ transfers}}{} \mid \frac{150000\ yd^3}{year} \mid \frac{year}{8760\text{ hour}} = \frac{0.004869\text{ lb } PM_{2.5}}{hr}$$

These sources were modeled as a single volume source with a 10-meter square area, 3.0 meters thick, with a release height of 2.0 meters. The initial dispersion coefficients were calculated as follows:

σ_{yo} = 10 m / 4.3 = 2.33 m

σ_{zo} = 3 m / 4.3 = 0.7 m

There is one elevated transfer of aggregate and sand: 1) transfer to elevated storage bin.

For the operational scenario for 1,000 cy/day concrete and 150,000 cy/year concrete, emissions from aggregate and sand transfers to elevated storage are as follows:

Daily $PM_{2.5}$:

$$\frac{1.155\text{ E-4 lb} + 2.665\text{ E-3 lb}}{yd^3\text{ - transfer}} \mid \frac{1\text{ transfers}}{} \mid \frac{1000\ yd^3}{day} \mid \frac{day}{24\text{ hour}} = \frac{0.005923\text{ lb } PM_{2.5}}{hr}$$

Annual $PM_{2.5}$:

$$\frac{1.155\text{ E-4 lb} + 2.665\text{ E-5 lb}}{yd^3\text{ - transfer}} \mid \frac{1\text{ transfers}}{} \mid \frac{150000\ yd^3}{year} \mid \frac{year}{8760\text{ hour}} = \frac{0.002434\text{ lb } PM_{2.5}}{hr}$$

These sources were modeled as a single volume source on or adjacent to a 6-meter square building, 4.1 meters high (corresponding approximately to two trailer-mounted offices, with a release height of 5.0 meters. The initial dispersion coefficients were calculated as follows:

σ_{yo} = 6 m / 4.3 = 1.40 m

σ_{zo} = 4.1 m / 2.15 = 1.91 m

Truck Loading

Base PM_{10} factor: 0.278 lb PM_{10} / ton - uncontrolled
Base $PM_{2.5}$ factor: 0.050 lb $PM_{2.5}$ / ton - uncontrolled
DEQ permitting staff assume 95% control by a well designed boot
Fraction of cement and supplement = (491 lb + 73 lb) / 4024 lb = 0.1402

Base uncontrolled $PM_{2.5}$ factor in terms of lb/yd^3

$$\frac{0.050 \text{ lb } PM_{2.5}}{\text{ton}} \left| \frac{0.1402 \text{ ton cem/sup}}{\text{ton concrete}} \right| \frac{\text{ton}}{2000 \text{ lb}} \left| \frac{4024 \text{ lb conc.}}{\text{yd}^3} \right. = \frac{1.410 \text{ E-2 lb } PM_{2.5}}{\text{yd}^3}$$

Base controlled $PM_{2.5}$ factor in terms of lb/yd^3

$$\frac{1.410 \text{ E-2 lb } PM_{2.5}}{\text{yd}^3} \left| \frac{(1\text{-}0.95)}{} \right. = \frac{7.052 \text{ E-4 lb } PM_{2.5} \text{ for boot system}}{\text{yd}^3}$$

Daily $PM_{2.5}$ Emissions

$$\frac{7.052 \text{ E-4 lb } PM_{2.5}}{\text{yd}^3} \left| \frac{1000 \text{ yd}^3}{\text{day}} \right| \frac{\text{day}}{24 \text{ hour}} = \frac{0.02938 \text{ lb } PM_{2.5}}{\text{hr}}$$

Annual $PM_{2.5}$ Emissions

$$\frac{7.052 \text{ E-4 lb } PM_{2.5}}{\text{yd}^3} \left| \frac{150{,}000 \text{ yd}^3}{\text{yr}} \right| \frac{\text{yr}}{8760 \text{ hr}} = \frac{0.01208 \text{ lb } PM_{2.5}}{\text{hr}}$$

Weigh Hopper Loading

Base PM_{10} factor: 0.0024 lb PM_{10} / ton uncontrolled
$PM_{2.5}$ base factor of 3.634 E-4 lb/ton uncontrolled based on $PM_{2.5}/PM_{10}$ ratio of k factors in material handling equation.
Assume controls to reduce emissions by 99% and vent to atmosphere through stack

Fraction of aggregate and sand = (1865 lb + 1428 lb) / 4024 lb = 0.8183

Base uncontrolled $PM_{2.5}$ factor in terms of lb/yd^3

$$\frac{3.634 \text{ E-4 lb } PM_{2.5}}{\text{ton}} \left| \frac{0.8183 \text{ ton agg/sand}}{\text{ton concrete}} \right| \frac{\text{ton}}{2000 \text{ lb}} \left| \frac{4024 \text{ lb conc.}}{\text{yd}^3} \right. = \frac{5.984 \text{ E-4 lb } PM_{2.5}}{\text{yd}^3}$$

Base controlled $PM_{2.5}$ factor in terms of lb/yd^3

$$\frac{5.984 \text{ E-4 lb } PM_{2.5}}{\text{yd}^3} \left| \frac{(1\text{-}0.99)}{} \right. = \frac{5.984 \text{ E-6 lb } PM_{2.5}}{\text{yd}^3}$$

Daily $PM_{2.5}$ Emissions

$$\frac{5.984 \text{ E-6 lb } PM_{2.5}}{\text{yd}^3} \left| \frac{1000 \text{ yd}^3}{\text{day}} \right| \frac{\text{day}}{24\text{-hour}} = \frac{2.493 \text{ E-4 lb } PM_{2.5}}{\text{hr}}$$

Annual $PM_{2.5}$ Emissions

$$\frac{5.984 \text{ E-6 lb } PM_{2.5}}{\text{yd}^3} \left| \frac{150{,}000 \text{ yd}^3}{\text{yr}} \right| \frac{\text{yr}}{8760 \text{ hr}} = \frac{1.025 \text{ E-4 lb } PM_{2.5}}{\text{hr}}$$

Loading of Cement Silo

Base PM_{10} factor of 0.00034 lb/ton for operations controlled by a fabric filter.

A $PM_{2.5}$ factor of 1.485E-4 lb/ton was calculated based on the assumption that 15% of PM emissions are $PM_{2.5}$. (0.00099 lb/ton)(0.15) = 1.485E-4 lb/ton

Fraction of cement = 491 lb / 4024 lb = 0.1220

Base controlled $PM_{2.5}$ factor in terms of lb/yd^3

$$\frac{1.485E\text{-}4 \text{ lb } PM_{2.5}}{\text{ton}} \left| \frac{0.1220 \text{ ton cement}}{\text{ton concrete}} \right| \frac{\text{ton}}{2000 \text{ lb}} \left| \frac{4024 \text{ lb conc.}}{yd^3} \right. = \frac{3.646 \text{ E-5 lb } PM_{2.5}}{yd^3}$$

Daily $PM_{2.5}$ Emissions

$$\frac{3.646 \text{ E-5 lb } PM_{2.5}}{yd^3} \left| \frac{1000 \text{ } yd^3}{\text{day}} \right| \frac{\text{day}}{\text{24-hour}} = \frac{0.001519 \text{ lb } PM_{2.5}}{\text{hr}}$$

Annual $PM_{2.5}$ Emissions

$$\frac{3.646 \text{ E-5 lb } PM_{2.5}}{yd^3} \left| \frac{150{,}000 \text{ } yd^3}{\text{yr}} \right| \frac{\text{yr}}{\text{8760 hr}} = \frac{0.0006243 \text{ lb } PM_{2.5}}{\text{hr}}$$

Loading of Cement Supplement Silo

Base PM_{10} factor of 0.0049 lb/ton for operations controlled by a fabric filter.

A $PM_{2.5}$ factor of 0.001335 lb/ton was calculated based on the assumption that 15% of PM emissions are $PM_{2.5}$. (0.0089 lb/ton)(0.15) = 0.001335 lb/ton

Fraction of supplement = 73 lb / 4024 lb = 0.01814

Base controlled $PM_{2.5}$ factor in terms of lb/yd^3

$$\frac{0.001335 \text{ lb } PM_{2.5}}{\text{ton}} \left| \frac{0.01814 \text{ ton cement}}{\text{ton concrete}} \right| \frac{\text{ton}}{2000 \text{ lb}} \left| \frac{4024 \text{ lb conc.}}{yd^3} \right. = \frac{4.873 \text{ E-5 lb } PM_{2.5}}{yd^3}$$

Daily $PM_{2.5}$ Emissions

$$\frac{4.873 \text{ E-5 lb } PM_{2.5}}{yd^3} \left| \frac{1000 \text{ } yd^3}{\text{day}} \right| \frac{\text{day}}{\text{24-hour}} = \frac{0.002030 \text{ lb } PM_{2.5}}{\text{hr}}$$

Annual $PM_{2.5}$ Emissions

$$\frac{4.873 \text{ E-5 lb } PM_{2.5}}{yd^3} \left| \frac{150{,}000 \text{ } yd^3}{\text{yr}} \right| \frac{\text{yr}}{\text{8760 hr}} = \frac{0.0008344 \text{ lb } PM_{2.5}}{\text{hr}}$$

Propane Boiler

Hot water boiler fueled by propane: 2 MMbtu/hr. Emissions calculated from DEQ CBP spreadsheet.

CBP Modeling Parameters

Cement and Supplement Silo Filling Baghouse Stacks

Release height = 5.0 meters; effective diameter of release area = 1.0 meters;
typical stack gas temperature = ambient; typical flow velocity = 0.001 meters/second (set to minimize plume momentum for horizontal or capped release).

Weigh Hopper Baghouse Stack

Release height = 3.0 meters; effective diameter of release area = 1.0 meters;
typical stack gas temperature = ambient; typical flow velocity = 0.001 meters/second (set to minimize plume momentum for horizontal or capped release).

Truck Loadout

Modeled as a volume source released at 5.0 meters adjacent to a building 6 meters X 6 meters, 4.1 meters high representing a trailer-mounted office.

Initial dispersion coefficients:

σ_{y0} = 6 m / 4.3 = 1.40 m

σ_{z0} = 4.1 m / 2.15 = 1.91 m

Aggregate/Sand Transfers at Ground Level

Release emissions in model from a 10 m X 10 m area 3 m high, released at 2.0 m

Initial dispersion coefficients:

σ_{y0} = 10 m / 4.3 = 2.33 m

σ_{z0} = 3 m / 4.3 = 0.70 m

Aggregate/Sand Transfers to Elevated Storage

Modeled as a volume source released at 5.0 meters adjacent to a building 6 meters X 6 meters, 4.1 meters high representing a trailer-mounted office.

Initial dispersion coefficients:

σ_{y0} = 6 m / 4.3 = 1.40 m

σ_{z0} = 4.1 m / 2.15 = 1.91 m

Hot Water Boiler

Release height = 5.0 meters; effective diameter of release area = 0.3 meters;
typical stack gas temperature = 450; typical flow velocity = 10.5 meters/second.

Power Generator

Stack gas temperatures and flow rates are often overestimated by permit applicants, likely because values reported by manufacturers are often based on values measured at the exhaust manifold rather than at the point of release to the atmosphere.

DEQ modeled all generator emissions at an exit gas temperature of 700 K. Exhaust flows were calculated using the following formula from the State of Washington Department of Ecology (Washington State Department of Ecology. *Suitability of Diesel-Powered Emergency Generators for Air Quality General Order of Approval: Evaluation of Control Technology, Ambient Impacts, and Potential Approval Criteria*. June 23, 2006):

$$\text{Flow} = 0.284\ m^3/(\text{sec}\cdot 100\ \text{hp})$$

The stack diameter was set such that the flow velocity was 44.6 meters/second (as per WA guidance).

The final point source parameters for the 180 hp engine were as follows:

> Stack height = 4.57 m; stack diameter = 0.12 meters; stack gas temperature = 700 K; flow velocity = 44.6 meters/second.

The final point source parameters for the 90 hp engine were as follows:

> Stack height = 4.57 m; stack diameter = 0.085 meters; stack gas temperature = 700 K; flow velocity = 44.6 meters/second.