Statement of Basis

Concrete Batch Operations General Permit

EC

W.I. Construction, Inc.
Arlington, Oregon
Facility ID No. 777-00516

Permit to Construct P-2011.0125
Project No. 60933

October 27, 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

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	cubic yards
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
LPG	liquefied petroleum gas
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

W.I. Construction, Inc. is a portable truck mix concrete batch plant that may consist of the following: aggregate stockpiles, a cement storage silo, 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 either by the local power grid or via an electric generator powered by a Caterpillar 374 bhp rated engine. Also, a propane water heater(s) may be used to heat the water in cold weather prior to use for the mixing of concrete.

Permitting History

The following information was derived from a review of the information supplied by the permittee and from permit files available to DEQ. All previous Permits to Construct (PTC) listed below are superseded (S) upon issuance of this general permit.

October 27, 2011	P-2011.0125, Project 60933, Initial General Permit (A)

Application Scope

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

Application Chronology

September 30, 2011	A combined PTC application and processing fee ($1,500) was received.
Oct 12 to Oct 27, 2011	A 15-day opportunity for a public comment period was held. No request for a public comment period was received.
October 13, 2011	P-2011.0125 project 60933 application was deemed complete.
October 27, 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: Erie Strayer Model: MCG-11T Maximum capacity: 160 cy/hr Maximum production: 500 cy/day and 150,000 cy/year	Cement Storage Silo Baghouse No. 1[c]: Manufacturer: C&W Model: CP-LPR8 8 Cartridges 8'' x 39'' Cement Supplement Storage Silo Flyash Baghouse No. 2[a]: Manufacturer: C&W Model: CP-LPR8 8 Cartridges 8'' x 39'' Weigh Batcher Baghouse: Manufacturer: C&W Model: CP-35 2 Cartridges 8'' x 19'' Load-out Shroud: Boot or shroud Material Transfer Point Water Sprays or Equivalent Best Management Practices Sprays and other suppressants	Baghouse No. 1 Stack: Stack height: 56 feet Exit air flow rate: 450 acfm Exit Temperature: Ambient Control efficiency: 99% Baghouse No. 2 Stack: Stack height: 56 feet Exit air flow rate:450 acfm Exit Temperature: Ambient Control efficiency: 99% Weigh Batcher Stack: Stack height: 25 feet Exit air flow rate: 216 acfm Exit Temperature: Ambient Control efficiency: 99% Load-out Boot: Control efficiency: 95% Materials Transfer: Control Efficiency: 75%
1.0 MMBtu/hr LPG water heater (or equivalent[b]) Maximum Rating: 1.0 MMBtu/hr Maximum Fuel Usage: MMscf/yr {or} gal/yr	None	Stack height: 15 feet Exit Velocity: 200 acfm
374 bhp rated engine (or equivalent[b]) Maximum Rating: 374 bhp Construction Date: May 26, 2009 EPA Certification: 3	none	Stack height: 12 feet Stack diameter 6.7 inches Exit Velocity: 2.4 acfm

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: 160 cy per hour concrete production capacity and concrete production limits of 500 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 5.0 MMBtu/hr diesel-fired water heater and a 1,340 bhp diesel-fired internal combustion engine are used. The total emissions associated with the facility are equal to or less than the equipment mentioned above. All possible equipment may not be included in 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(s). AP-42 Sections 1.3, 1.4 and 1.5 (9/98) were used to calculate emissions from the water heaters.

Fugitive emissions of particulate matter (PM), $PM_{2.5}$ 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. Detailed emissions calculations can be found in Appendix A of this document.

Emissions Inventory for 1.0 MMBtu/hr Water Heater(s)

W.I. Construction, Inc. has a 1.0 MMBtu/hr LPG water heater(s). The water heater(s) will be used on a limited basis and thus have a fuel usage limit. The usage is based on calculations associated with the rated capacity of the unit, the heating value and the annual hours of operation. Natural Gas emissions are derived from AP-42, Section 1.4 (07/98) where the heating value was assumed to be 1,020 MMBtu/MMscf. Similarly, LPG and diesel heating values were obtained from AP-42 Section 1.5 (10/96) and Section 1.3 (09/98), respectively. Heating values were assumed to be 91.5 MMBtu/10^3 gal and 140 MMBtu/10^3 gal. Note that the water heater does not have any control devices associated with it. Detailed emissions calculations can be found in Appendix A of this document.

Emissions Inventory for 374 bhp, Tier 3 Certified Engine(s)

Emissions are based on using diesel fuel in a Tier 3, 374 bhp. The maximum fuel use rate was calculated in gal/hr and was based on the total 374 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.

$$\max fuel = \frac{(rating * BSFC)}{(fuelheatingvalue)} = \frac{(374bhp * 7{,}000Btu/hp-hr)}{(137{,}030Btu/gal)} = 19.11gal/hr$$

The facility may use any engine of choice, but if the corresponding emissions exceed those of a Tier II, 1,340 bhp the operating hours are reduced. Emission factors are derived from one of three sources: 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.

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 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 2 transfer points.

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[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.

[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%.

Table 2 FACILITY WIDE CRITERIA POLLUTANT EMISSION ESTIMATES

Emissions Unit	$PM_{2.5}$	PM_{10}	SO_2	NO_x	CO	VOC	Lead	CO2e
	T/yr	T/yr	T/yr	T/yr	T/yr	T/yr	T/yr	T/yr
Concrete Batch Plant	0.017	0.08	--	--	--	--	1.52E-05	--
LPG Water Heater	0.038	0.038	7.08E-02	0.718	0.402	0.053	--	17
Small Diesel Fired Engine(s)	0.02	0.02	6.35E-04	0.34	0.34	0.13	--	69
Transfer Points	0.059	0.19	--	--	--	--	--	--
Total	**0.13**	**0.33**	**0.07**	**1.06**	**0.74**	**0.18**	**1.52E-05**	**86.00**

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 3 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.
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 water heater 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 emissions at this facility are subject to the State of Idaho visible emissions standard of 20% opacity. This requirement is assured by Permit Conditions 9 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.

Standards for New Sources (IDAPA 58.01.01.677)

The fuel burning equipment located at this facility, with a maximum rated input of ten (10) million BTU per hour or less, are subject to a particulate matter limitation of 0.015 gr/dscf of effluent gas corrected to 3% oxygen by volume when combusting gaseous fuels. Fuel-Burning Equipment is defined as any furnace, boiler, apparatus, stack and all appurtenances thereto, used in the process of burning fuel for the primary purpose of producing heat or power by indirect heat transfer. This requirement is assured by Permit Condition 20.

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 374 bhp IC engine was constructed, modified or reconstructed on February 10, 2006, which is after July 11, 2005. Therefore the engine is 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 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?

(b) If you are an owner or operator of a pre-2007 model year stationary CI internal combustion engine and must comply with the emission standards specified in Sec. Sec. 60.4204(a), you must demonstrate compliance according to one of the methods specified in paragraphs (b)(1) through (5) of this section.

(1) Purchasing an engine certified according to 40 CFR part 89 or 40 CFR part 94, as applicable, for the same model year and maximum engine power. The engine must be installed and configured according to the manufacturer's specifications.

(2) Keeping records of performance test results for each pollutant for a test conducted on a similar engine. The test must have been conducted using the same methods specified in this subpart and these methods must have been followed correctly.

(3) Keeping records of engine manufacturer data indicating compliance with the standards.

(4) Keeping records of control device vendor data indicating compliance with the standards.

(5) Conducting an initial performance test to demonstrate compliance with the emission standards according to the requirements specified in Sec. 60.4212, as applicable.

The Permittee is subject to 60.4204(a), therefore the engine must be installed and configured according to the manufacturer's specifications. Recordkeeping is necessary to demonstrate that the engine(s) are being installed, operated and maintained according to manufacturer's specifications. This requirement is included in the PTC.

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

A Performance test on the IC engine is not required because maintaining the engine in accordance with manufacturer specifications is required for the General Permit. Therefore testing is not an option to the Permittee and the 374 bhp IC engine.

§ 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 374 bhp IC engine.

§ 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 water heater(s). Fuels that are allowed include: natural gas, diesel or LPG.

Permit Condition 4.

The restriction of sulfur content is to maintain consistency between the water heater(s) 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. This requires compliance with IDAPA 58.01.01.650-651.

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 9 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.

Visible Emissions

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.

Emissions Limits

Permit Condition 20.

The emissions limits for a LPG water heater are listed in IDAPA 58.01.01.677. Specifically, the permittee shall not discharge PM to the atmosphere from any fuel-burning equipment source in excess of 0.050 gr/dscf of effluent gas corrected to 3% oxygen by volume for liquid or 0.015 gr/dscf of effluent gas corrected to 3% oxygen by volume for gaseous fuels.

Operating Requirements

Permit Condition 21.

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.

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.

Permit Condition 22.

This condition limits the total amount of hours the facility may operate in any given day. There also may be restrictions to daylight hours. This restriction may be included to help limit the setback distance related to 1-hr NO_2 NAAQS. During daylight hours dispersion may be better and fewer emissions may remain in close proximity to the facility.

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.

Permit Condition 29.

Daily records of the hours of operation of the facility must be kept to demonstrate compliance with the hours of operation permit condition.

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 3 certified and that documentation stating such is maintained onsite.

Permit Condition 32.

This condition is included to limit the engine(s) use to those hours requested by the permittee. The engine limitation was added to help reduce the setback distance. Note that the modeling associated with this condition assumes that if there are multiple engines onsite that they are operating simultaneously. But this is a permittee-defined condition so the stringency associated with the condition is dependent on what operating requirements are needed by the facility.

Monitoring & Recordkeeping

Permit Condition 33.

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 34.

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 35.

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 36.

40 CFR 60, Subpart IIII has a number of recordkeeping requirements for older engines that are subject to 40 CFR 60, Subpart IIII due to a modification or reconstruction. These include notifications, maintenance of engines and documentation demonstrating compliance with the emission standards of the Subpart.

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).

Notification & Reporting

Permit Condition 37.

All reports and notifications need to be sent to the appropriate DEQ Regional Office. This condition provides the mailing address.

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 assess 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

PROPANE/BUTANE COMBUSTION, AP-42 SECTION 1.5 (9/98)

Operating Assumptions: 1 MMBtu/hr / 91.5 MMBtu/10^3 gal = 1.09E-02 10^3 gal/hr

24 hr/day

8,760 hr/yr

Fuel Use:

262.30 gal/day

95,738 gal/year

Criteria Air Pollutants	Emission Factor	Emissions		CBP + Boiler Emissions	Modeling Threshold		Modeling Required?	Modeling Threshold		Modeling Required?
	lb/10^3 gal	lb/hr	T/yr	T/yr	2002 Guidance			Case-by-Case		
NO2	15	1.64E-01	7.18E-01	7.18E-01	1	T/yr	No	7	T/yr	No
CO	8.4	9.18E-02	4.02E-01	4.02E-01	14	lb/hr	No	70	lb/hr	No
PM10 (filterable + condensable)	0.8	8.74E-03	3.83E-02	1.20E-01	0.2	lb/hr	No	0.9	lb/hr	No
		8.74E-03	3.83E-02		1	T/yr	No	7	T/yr	No
PM2.5 (filterable + condensable)	0.8	8.74E-03	3.83E-02	5.54E-02						
		8.74E-03	3.83E-02							
SOx (SO2 + SO3)	1.479	1.62E-02	7.08E-02	7.08E-02	0.2	lb/hr	No	0.9	lb/hr	No
		1.62E-02	7.08E-02		1	T/yr	No	7	T/yr	No
VOC (TOC)	1.1	1.20E-02	5.27E-02	5.27E-02	40	T/yr	No			
Lead EF = 9 lb/10^{12} Btu	0	0.00E+00	0.00E+00	4.78E-03	0.6	T/yr	No			
Lead, continued			0.00E+00	lb/quarter	10	lb/mo	No			
		TOTAL	1.28E+00	T/yr	Note: 100 lb/mo Pb in guidance reduced by factor of 10 based on latest Pb NAAQS (reduced in 2008 from 1.5 ug/m3 to 0.15 ug/m3)					

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

TOTAL CBP + WATER HEATER EMISSIONS (POINT SOURCES, T/YR)	1.42

CURRENT PTC APPLICATION ESTIMATES

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

Internal Combustion Engine(s) AP-42 Section 3.3 or 3.4 (diesel fueled)			
		Fuel Type(s)	**Generator Toggle**
Generator Make/Model	**Enter Info**	#2 Fuel Oil (Diesel)	**1**
Rating of Large Engine (hp)	**0.0**	Max Sulfur weight percent (w/o)	**0.0015%**
Rating of Small Engine #1 (hp)	**374.0**		
Rating of Small Engine #2 (hp)	**0.0**		
EF OPTIONS:		**Use EFs in lb/MMBtu fuel input**	
1 hp = 0.7456999 kW	0.7457	Calculated Max Fuel Use Rate, gal/hr (Large)	0.00
Avg brake-specific fuel consumption (BSFC) = 7000 Btu/hp-hr	7000	Calculated Max Fuel Use Rate, gal/hr (small #1)	19.11
Fuel Heating Value, Btu/gal	137,030	Calculated Max Fuel Use Rate, gal/hr (small #2)	0.00
		Calculated MMBtu/hr (Large)	0.00
		Calculated MMBtu/hr (Small #1)	2.62
		Calculated MMBtu/hr (Small #2)	0.00
Note: AP-42 Tables 3.3-x,3.4-x: avg diesel heating value is based on 19,300 Btu/lb with density equal 7.1 lb/gal=> Btu/gal =			137,030

EPA Certification for Large Engine:	**-1**
Not EPA-certified: Enter "0" (zero)	
Certified Tier I, Tier 2, Tier 3, or Tier 4: Enter 1, 2, 3, or 4	
Certified "BLUE SKY" engine: Enter 5	

EPA Certification for Small Engine #1:	**3**	**EPA Certification for Small Engine #2:**	**-1**
Not EPA-certified: Enter "0" (zero)		Not EPA-certified: Enter "0" (zero)	
Certified Tier I, Tier 2, Tier 3, or Tier 4: Enter 1, 2, 3, or 4		Certified Tier I, Tier 2, Tier 3, or Tier 4: Enter 1, 2, 3, or 4	
Certified "BLUE SKY" engine: Enter 5		Certified "BLUE SKY" engine: Enter 5	

Facility: WI Construction, Inc.

10/17/2011 10:12 **Permit/Facility ID:** P-2011.0125 Proj 60933 777-00516 User Input Weight % Sulfur = 0.0015% SO2 EF = 1.01 x S

Large Engine

Fuel Type Toggle = 1 0 hp Engine
Fuel Consumption Rate 0.00 gal/hr
Calculated MMBtu/hr 0.0000 MMBtu/hr
Max Daily Operation 0 hr/day
Max Annual Operation 0 hrs/yr

Pollutant	Emission Factor[a] (lb/MMBtu)	Emissions (lb/hr)	Emissions (T/yr)	TAPs Emissions (lb/hr) Annual or 24-hr Average
PM[b]	0.1	0.000	0.00	
PM-10 (total)[c]	0.000	0.000	0.000	
P.M.-2.5	0.000	0.000	0.000	
CO[b]	0.00	0.000	0.00	
NOx[b]	0.000	0.000	0.00	
SO_2[b] (total SOx presum	0.001515	0.000	0.000	
VOC[b] (total TOC--> VOC	0.000	0.000	0.000	
Lead				
HCl[e]				
Dioxins[e]				
2,3,7,8-TCDD				
Total TCDD				
1,2,3,7,8-PeCDD				
Total PeCDD				
1,2,3,4,7,8-HxCDD[c]				
1,2,3,6,7,8-HxCDD				
1,2,3,7,8,9-HxCDD[c]				
Total HxCDD				
1,2,3,4,6,7,8-Hp-CDD[c]				
Total $HpCDD_c$				
Octa CDD[c]				
Total PCDD[c]				
Furans[e]				
2,3,7,8-TCDF				
Total TCDF[c]				
1,2,3,7,8-PeCDF				
2,3,4,7,8-PeCDF				
Total PeCDF[c]				
1,2,3,4,7,8-HxCDF				
1,2,3,6,7,8-HxCDF				
2,3,4,6,7,8-HxCDF				
1,2,3,7,8,9-HxCDF				
Total HxCDF[c]				
1,2,3,4,6,7,8-HpCDF				
1,2,3,4,7,8,9-HpCDF				
Total HpCDF[c]				
Octa CDF[c]				
Total PCDF[c]				
Total PCDD/PCDF[c]				
Non-PAH HAPs				
Acetaldehyde[c]	7.67E-04	0.00E+00	0.00E+00	0.00E+00
Acrolein[c]	9.25E-05	0.00E+00	0.00E+00	0.00E+00
Benzene[c,e]	9.33E-04	0.00E+00	0.00E+00	0.00E+00
1,3-Butadiene[c,e]	3.91E-05	0.00E+00	0.00E+00	0.00E+00
Ethylbenzene[e]				
Formaldehyde[c,e]	1.18E-03	0.00E+00	0.00E+00	0.00E+00
Hexane[e]				
Isooctane				
Methyl Ethyl Ketone[e]				
Pentane[e]				
Propionaldehyde[e]				
Quinone[e]				
Methyl chloroform[e]				
Toluene[c,e]	4.09E-04	0.00E+00	0.00E+00	0.00E+00
Xylene[c,e]	2.85E-04	0.00E+00	0.00E+00	0.00E+00
PAH, Total		0.00E+00		0.00E+00
POM (7-PAH Group)		0.00E+00	0.00E+00	0.00E+00

Pollutant	Emission Factor[a] (lb/MMBtu)	Emissions (lb/hr)	Emissions (T/yr)	TAPs Emissions (lb/hr) Annual or 24-hr Average
PAH HAPs				
2-Methylnaphthalene				
3-Methylchloranthrene[e]				
Acenaphthene[c1]	1.42E-06	0.00E+00	0.00E+00	0.00E+00
Acenaphthylene[c1]	5.06E-06	0.00E+00	0.00E+00	0.00E+00
Anthracene[c1]	1.87E-06	0.00E+00	0.00E+00	0.00E+00
Benzo(a)anthracene[c1]	1.68E-06	0.00E+00	0.00E+00	0.00E+00
Benzo(a)pyrene[c1,e]	1.88E-07	0.00E+00	0.00E+00	0.00E+00
Benzo(b)fluoranthene[c1]	9.91E-08	0.00E+00	0.00E+00	0.00E+00
Benzo(e)pyrene				
Benzo(g,h,i)perylene[c1]	4.89E-07	0.00E+00	0.00E+00	0.00E+00
Benzo(k)fluoranthene[c1]	1.55E-07	0.00E+00	0.00E+00	0.00E+00
Chrysene[c1]	3.53E-07	0.00E+00	0.00E+00	0.00E+00
Dibenzo(a,h)anthracene[c1]	5.83E-07	0.00E+00	0.00E+00	0.00E+00
Dichlorobenzene				
Fluoranthene[c1]	7.61E-06	0.00E+00	0.00E+00	0.00E+00
Fluorene[c1]	2.92E-05	0.00E+00	0.00E+00	0.00E+00
Indeno(1,2,3-cd)pyrene[c1]	3.75E-07	0.00E+00	0.00E+00	0.00E+00
Naphthalene[c1,e]	8.48E-05	0.00E+00	0.00E+00	0.00E+00
Perylene				
Phenanthrene[c1]	2.94E-05	0.00E+00	0.00E+00	0.00E+00
Pyrene[c1]	4.78E-06	0.00E+00	0.00E+00	0.00E+00
Non-HAP Organic Compounds				
Acetone[e]				
Benzaldehyde				
Butane				
Butyraldehyde				
Crotonaldehyde[e]				
Ethylene				
Heptane				
Hexanal				
Isovaleraldehyde				
2-Methyl-1-pentene				
2-Methyl-2-butene				
3-Methylpentane				
1-Pentene				
n-Pentane				
Valeraldehyde				
Metals				
Antimony[e]				
Arsenic[e]				
Barium[e]				
Beryllium[e]				
Cadmium[e]				
Chromium[e]				
Cobalt[e]				
Copper[e]				
Hexavalent Chromium[e]				
Manganese[e]				
Mercury[e]				
Molybdenum[e]				
Nickel[e]				
Phosphorus[e]				
Silver[e]				
Selenium[e]				
Thallium[e]				
Vanadium[e]				
Zinc[e]				

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

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

Facility:	**WI Construction, Inc.**						
		P-2011.0125					
10/26/2011 15:33	**Permit/Facility ID:**	Proj 60933	777-00516	User Input Weight % Sulfur =	0.0015%	SO2 EF = 1.01 x S	

Small Engine #1

Fuel Type Toggle =	1	374 hp Engine
Fuel Consumption Rate	19.11 gal/hr	
Calculated MMBtu/hr	2.6180 MMBtu/hr	
Max Daily Operation	12 hr/day	
Max Annual Operation	320 hrs/yr	

Pollutant	Emission Factor[a] (lb/MMBtu)	Emissions (lb/hr)	Emissions (T/yr)	TAPs Emissions (lb/hr) Annual or 24-hr Average
PM[b]	0.1	0.262	0.04	
PM-10 (total)[b]	0.047	0.123	0.020	
P.M.-2.5	0.047	0.123	0.02	
CO[b]	0.82	2.152	0.34	
NOx[b]	0.939	2.459	0.39	
SO_2[b] (total SOx presumed SO2)	0.001515	0.004	0.001	
VOC[b] (total TOC--> VOCs)	0.310	0.812	0.130	
Lead				
HCl[e]				
Dioxins[e]				
2,3,7,8-TCDD				
Total TCDD				
1,2,3,7,8-PeCDD				
Total PeCDD				
1,2,3,4,7,8-HxCDD[e]				
1,2,3,6,7,8-HxCDD				
1,2,3,7,8,9-HxCDD[e]				
Total HxCDD				
1,2,3,4,6,7,8-Hp-CDD[e]				
Total HpCDD,				
Octa CDD[e]				
Total PCDD[e]				
Furans[e]				
2,3,7,8-TCDF				
Total TCDF[e]				
1,2,3,7,8-PeCDF				
2,3,4,7,8-PeCDF				
Total PeCDF[e]				
1,2,3,4,7,8-HxCDF				
1,2,3,6,7,8-HxCDF				
2,3,4,6,7,8-HxCDF				
1,2,3,7,8,9-HxCDF				
Total HxCDF[e]				
1,2,3,4,6,7,8-HpCDF				
1,2,3,4,7,8,9-HpCDF				
Total HpCDF[e]				
Octa CDF[e]				
Total PCDF[e]				
Total PCDD/PCDF[e]				
Non-PAH HAPs				
Acetaldehyde[e]	7.67E-04	2.01E-03	3.21E-04	7.34E-05
Acrolein[e]	9.25E-05	2.42E-04	3.87E-05	1.21E-04
Benzene[c,e]	9.33E-04	2.44E-03	3.91E-04	8.92E-05
1,3-Butadiene[c,e]	3.91E-05	1.02E-04	1.64E-05	3.74E-06
Ethylbenzene[e]				
Formaldehyde[c,e]	1.18E-03	3.09E-03	4.94E-04	1.13E-04
Hexane[e]				
Isooctane				
Methyl Ethyl Ketone[e]				
Pentane[e]				
Propionaldehyde[e]				
Quinone[e]				
Methyl chloroform[e]				
Toluene[c,e]	4.09E-04	1.07E-03	1.71E-04	5.35E-04
Xylene[c,e]	2.85E-04	7.46E-04	1.19E-04	3.73E-04
PAH, Total		4.40E-04		1.81E-05
POM (7-PAH Group)		8.99E-06	1.44E-06	3.28E-07

Pollutant	Emission Factor[a] (lb/MMBtu)	Emissions (lb/hr)	Emissions (T/yr)	TAPs Emissions (lb/hr) Annual or 24-hr Average
PAH HAPs				
2-Methylnaphthalene				
3-Methylchloranthrene[e]				
Acenaphthene[c,f]	1.42E-06	3.72E-06	5.95E-07	1.36E-07
Acenaphthylene[c,f]	5.06E-06	1.32E-05	2.12E-06	4.84E-07
Anthracene[c,f]	1.87E-06	4.90E-06	7.83E-07	1.79E-07
Benzo(a)anthracene[c,f]	1.68E-06	4.40E-06	7.04E-07	1.61E-07
Benzo(a)pyrene[c,f,g]	1.88E-07	4.92E-07	7.87E-08	1.80E-08
Benzo(b)fluoranthene[c,f]	9.91E-08	2.59E-07	4.15E-08	9.48E-09
Benzo(e)pyrene				
Benzo(g,h,i)perylene[c,f]	4.89E-07	1.28E-06	2.05E-07	4.68E-08
Benzo(k)fluoranthene[c,f]	1.55E-07	4.06E-07	6.49E-08	1.48E-08
Chrysene[c,f]	3.53E-07	9.24E-07	1.48E-07	3.38E-08
Dibenzo(a,h)anthracene[c,f]	5.83E-07	1.53E-06	2.44E-07	5.58E-08
Dichlorobenzene				
Fluoranthene[c,f]	7.61E-06	1.99E-05	3.19E-06	7.28E-07
Fluorene[c,f]	2.92E-05	7.64E-05	1.22E-05	2.79E-06
Indeno(1,2,3-cd)pyrene[c,f]	3.75E-07	9.82E-07	1.57E-07	3.59E-08
Naphthalene[c,f,g]	8.48E-05	2.22E-04	3.55E-05	8.11E-06
Perylene	2.94E-05	7.70E-05	1.23E-05	2.81E-06
Phenanthrene[c,f]	4.78E-06	1.25E-05	2.00E-06	4.57E-07
Pyrene[c,f]				
Non-HAP Organic Compounds				
Acetone[e]				
Benzaldehyde				
Butane				
Butyraldehyde				
Crotonaldehyde[e]				
Ethylene				
Heptane				
Hexanal				
Isovaleraldehyde				
2-Methyl-1-pentene				
2-Methyl-2-butene				
3-Methylpentane				
1-Pentene				
n-Pentane				
Valeraldehyde				
Metals				
Antimony[e]				
Arsenic[e]				
Barium[e]				
Beryllium[e]				
Cadmium[e]				
Chromium[e]				
Cobalt[e]				
Copper[e]				
Hexavalent Chromium[e]				
Manganese[e]				
Mercury[e]				
Molybdenum[e]				
Nickel[e]				
Phosphorus[e]				
Silver[e]				
Selenium[e]				
Thallium[e]				
Vanadium[e]				
Zinc[e]				

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

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

Combined Emissions of Small Engines

Pollutant	Total Emissions (lb/hr)	Total Emissions (T/yr)	Pollutant	Total Emissions (lb/hr)	Total Emissions (T/yr)
PM [b]	0.262	0.04	PAH HAPs		
PM-10 (total) [a]	0.123	0.02	2-Methylnaphthalene		
P.M.-2.5	0.123	0.02	3-Methylchloranthrene [e]		
CO [b]	2.152	0.34	Acenaphthene [c]	1.38E-07	5.95E-07
NOx [b]	2.459	0.39	Acenaphthylene [c]	4.64E-07	2.12E-06
SO_2 [b] (total SOx presumed SO2)	0.004	0.00	Anthracene [c]	1.79E-07	7.83E-07
VOC [b] (total TOC--> VOCs)	0.812	0.13	Benzo(a)anthracene [c]	1.61E-07	7.04E-07
Lead			Benzo(a)pyrene [c,e]	1.80E-08	7.87E-08
HCl [a]			Benzo(b)fluoranthene [c]	9.48E-09	4.15E-08
Dioxins [c]			Benzo(e)pyrene		
2,3,7,8-TCDD			Benzo(g,h,i)perylene [c]	4.68E-08	2.05E-07
Total TCDD			Benzo(k)fluoranthene [c]	1.48E-08	6.49E-08
1,2,3,7,8-PeCDD			Chrysene [c]	3.38E-08	1.48E-07
Total PeCDD			Dibenzo(a,h)anthracene [c]	5.58E-08	2.44E-07
1,2,3,4,7,8-HxCDD [e]			Dichlorobenzene		
1,2,3,6,7,8-HxCDD			Fluoranthene [c]	7.28E-07	3.19E-06
1,2,3,7,8,9-HxCDD [e]			Fluorene [c]	2.79E-06	1.22E-05
Total HxCDD			Indeno(1,2,3-cd)pyrene [c]	3.59E-08	1.57E-07
1,2,3,4,6,7,8-Hp-CDD [e]			Naphthalene [c,e]	8.11E-06	3.55E-05
Total $HpCDD_s$			Perylene	2.81E-06	1.23E-05
Octa CDD [e]			Phenanthrene [c]	4.57E-07	2.00E-06
Total PCDD [e]			Pyrene [c]	0.00E+00	0.00E+00
Furans [c]			Non-HAP Organic Compounds		
2,3,7,8-TCDF			Acetone [e]		
Total TCDF [e]			Benzaldehyde		
1,2,3,7,8-PeCDF			Butane		
2,3,4,7,8-PeCDF			Butyraldehyde		
Total PeCDF [e]			Crotonaldehyde [e]		
1,2,3,4,7,8-HxCDF			Ethylene		
1,2,3,6,7,8-HxCDF			Heptane		
2,3,4,6,7,8-HxCDF			Hexanal		
1,2,3,7,8,9-HxCDF			Isovaleraldehyde		
Total HxCDF [e]			2-Methyl-1-pentene		
1,2,3,4,6,7,8-HpCDF			2-Methyl-2-butene		
1,2,3,4,7,8,9-HpCDF			3-Methylpentane		
Total HpCDF [e]			1-Pentene		
Octa CDF [e]			n-Pentane		
Total PCDF [e]			Valeraldehyde		
Total PCDD/PCDF [e]			Metals		
Non-PAH HAPs			Antimony [e]		
Acetaldehyde [c]	7.34E-05	3.21E-04	Arsenic [e]		
Acrolein [c]	1.21E-04	3.87E-05	Barium [e]		
Benzene [c,e]	8.92E-05	3.91E-04	Beryllium [e]		
1,3-Butadiene [c,e]	3.74E-06	1.64E-05	Cadmium [e]		
Ethylbenzene [e]			Chromium [e]		
Formaldehyde [c,e]	1.13E-04	4.94E-04	Cobalt [e]		
Hexane [e]			Copper [e]		
Isooctane			Hexavalent Chromium [e]		
Methyl Ethyl Ketone [e]			Manganese [e]		
Pentane [e]			Mercury [e]		
Propionaldehyde [e]			Molybdenum [e]		
Quinone [e]			Nickel [e]		
Methyl chloroform [e]			Phosphorus [e]		
Toluene [c,e]	5.35E-04	1.71E-04	Silver [e]		
Xylene [c,e]	3.73E-04	1.19E-04	Selenium [e]		
			Thallium [e]		
PAH, Total	1.61E-05	1.61E-05	Vanadium [e]		
POM (7-PAH Group)	3.28E-07	1.44E-06	Zinc [e]		

Facility: WI Construction, Inc.

10/17/2011 10:12 Permit/Facility ID: P-2011.0125 Proj 60933 777-00516

Greenhouse Gas Emissions when Combusting Natural Gas

Water Heater #1 Emissions	Emission Factor (EF)	EF Units	EF Source	T/yr	Global Warming Potential	CO_2e (T/yr)
CO_2	0	lb/MMscf	AP-42 Table 1.4-2	0.00	1	0.00
Methane	0	lb/MMscf	AP-42 Table 1.4-2	0.00E+00	21	0.00E+00
N_2O	0	lb/MMscf	AP-42 Table 1.4-2	0.00E+00	310	0.00E+00

* Water Heater #1 does not burn Natural Gas.

Water Heater #2 Emissions	Emission Factor (EF)	EF Units	EF Source	T/yr	Global Warming Potential	CO_2e (T/yr)
CO_2	0	lb/MMscf	AP-42 Table 1.4-2	0.00	1	0.00
Methane	0	lb/MMscf	AP-42 Table 1.4-2	0.00E+00	21	0.00E+00
N_2O	0	lb/MMscf	AP-42 Table 1.4-2	0.00E+00	310	0.00E+00

* Water Heater #2 does not burn Natural Gas.

Greenhouse Gas Emissions when Combusting #2 Diesel

Water Heater #1 Emissions	Emission Factor (EF)	EF Units	EF Source	T/yr	Global Warming Potential	CO_2e (T/yr)
CO_2	Molecular conversion from C to CO_2			0.00	1	0.00
Methane	0	lb/10^3 gal	AP-42 Table 1.3-3	0.00E+00	21	0.00E+00
N_2O	0	lb/10^3 gal	AP-42 Table 1.3-8	0.00E+00	310	0.00E+00

* Water Heater #1 does not burn Diesel.

Water Heater #2 Emissions	Emission Factor (EF)	EF Units	EF Source	T/yr	Global Warming Potential	CO_2e (T/yr)
CO_2	Mocular conversion from C to CO_2			0.00	1	0.00
Methane	0	lb/10^3 gal	AP-42 Table 1.3-3	0.00E+00	21	0.00E+00
N_2O	0	lb/10^3 gal	AP-42 Table 1.3-8	0.00E+00	310	0.00E+00

* Water Heater #2 does not burn Diesel.

Greenhouse Gas Emissions when Combusting LPG

Water Heater #1 Emissions	Emission Factor (EF)	EF Units	EF Source	T/yr	Global Warming Potential	CO_2e (T/yr)
CO_2	14300	lb/10^3 gal	AP-42 Table 1.5-1	16.70	1	16.70
Methane	0.9	lb/10^3 gal	AP-42 Table 1.5-1	1.05E-03	21	2.21E-02
N_2O	0.2	lb/10^3 gal	AP-42 Table 1.5-1	2.34E-04	310	7.24E-02

* Assumes a fuel heating value of 137,030 gal/Btu and a heaterwith a rating of 1 MMBtu/hr.

Water Heater #2 Emissions	Emission Factor (EF)	EF Units	EF Source	T/yr	Global Warming Potential	CO_2e (T/yr)
CO_2	0	lb/10^3 gal	AP-42 Table 1.5-1	0.00	1	0.00
Methane	0	lb/10^3 gal	AP-42 Table 1.5-1	0.00E+00	21	0.00E+00
N_2O	0	lb/10^3 gal	AP-42 Table 1.5-1	0.00E+00	310	0.00E+00

* Water Heater #2 does not burn Propane.

Greenhouse Gas Emissions when Combusting Diesel Fuel

Small Engine #1 Emissions ≤ 600 bhp	Emission Factor (EF)	EF Units	EF Source	T/yr	Global Warming Potential	CO_2e (T/yr)
CO_2	1.15	lb/bhp-hr	AP-42 Table 3.3-1	68.82	1	68.82

* Assumes an engine with a rating of 374 bhp.

Small Engine #2 Emissions ≤ 600 bhp	Emission Factor (EF)	EF Units	EF Source	T/yr	Global Warming Potential	CO_2e (T/yr)
CO_2	1.15	lb/bhp-hr	AP-42 Table 3.3-1	0.00	1	0.00

* There is no second small engine at this facility.

Large Engine #1 Emissions > 600 bhp	Emission Factor (EF)	EF Units	EF Source	T/yr	Global Warming Potential	CO_2e (T/yr)
CO_2	1.16	lb/bhp-hr	AP-42 Table 3.4-1	0.00	1	0.00

* There is no large engine atthis facility.

Total Greenhouse Gas Emissions

	CO_2e (T/yr)
CO_2	85.51
Methane	0.02
N_2O	0.07
Total	85.61

Facility: WI Construction, Inc.
10/17/2011 10:12 **Permit/Facility ID:** 777-00516 P-2011.0125 Proj 60933

Max Hourly Production	160 cy/hr	82% T/hr is Aggregate =	131 cy/hr
Max Daily Production	500 cy/day	82% T/hr is Aggregate =	410 cy/day
Max Annual Production	150,000 cy/yr	82% T/hr is Aggregate =	123,000 cy/yr

Aggregate is considered both coarse and fine (sand).The 82% is based on 1,866 lb coarse aggregate, 1,428 lb sand, 564 lb cement/supplement and 167 lb water for a total of 4,024 lb concrete

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

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

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

Mean wind spped: 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).

Moisture Content: 4.17 % and 1.77% were the average percentages for sand and aggegate respectively. These values are based on EPA tests conducted at Cheney Enterprises Cement plant in Roanoke, VA, 1994. (AP-42 11-12 06/06).

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

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

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

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

Mean wind spped: 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).

Moisture Content: 4.17 % and 1.77% were the average percentages for sand and aggegate respectively. These values are based on EPA tests conducted at Cheney Enterprises

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

Conveyor and Scalping Screen Emission Points

Moisture/Control %:

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

Sand aggregate for CBPs is 36%

Coarse aggregate for CBPs is 46%

Fine Aggegate (Sand) Transfer to Conveyor

Transfer from truck to conveyor: 131 cy/hr 2 Transfer Points

Pollutant	Emission Factor Table 11.12-5 CONVEYOR TRANSFER PT CONTROLLED (lb/cy)	Emissions Per Transfer Point: Emissions (lb/hr) 1-hr Average	Emissions (lb/hr) 24-hr Average	Emissions (T/yr)	Emissions (lb/hr) Annual Average	Total Emissions: Emissions (lb/hr) 1-hr Average	Emissions (lb/hr) 24-hr Average	Emissions (T/yr)	Emissions (lb/hr) Annual Average
PM (total)	0.0015	0.064	0.008	3.00E-02	6.84E-03	0.128	0.017	5.99E-02	1.37E-02
PM-10 (total)	7.00E-04	0.030	0.004	1.40E-02	3.19E-03	0.060	0.008	2.80E-02	6.38E-03
PM-2.5 (total)	2.25E-04	0.010	0.030	4.49E-03	1.97E-02	0.019	0.060	8.99E-03	3.94E-02

Coarse Aggegate Transfer to Conveyor

Transfer from truck to conveyor: 131 cy/hr 2 Transfer Points

Pollutant	Emission Factor Table 11.12-5 CONVEYOR TRANSFER PT CONTROLLED (lb/cy)	Emissions Per Transfer Point: Emissions (lb/hr) 1-hr Average	Emissions (lb/hr) 24-hr Average	Emissions (T/yr)	Emissions (lb/hr) Annual Average	Total Emissions: Emissions (lb/hr) 1-hr Average	Emissions (lb/hr) 24-hr Average	Emissions (T/yr)	Emissions (lb/hr) Annual Average
PM (total)	0.0064	0.353	0.046	1.66E-01	3.78E-02	0.707	0.092	3.31E-01	7.56E-02
PM-10 (total)	3.10E-03	0.171	0.022	8.02E-02	1.83E-02	0.342	0.045	1.60E-01	3.66E-02
PM-2.5 (total)	9.60E-04	0.053	0.166	2.48E-02	1.09E-01	0.106	0.331	4.97E-02	2.18E-01

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: October 17, 2011

TO: Eric Clark, Air Program

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

PROJECT: P-2011.0125 PROJ60933 PTC Application for the W.I. Construction, Inc., Concrete Batch Plant

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

1.0 Summary

W.I. Construction, Inc. (WI) submitted a Permit to Construct (PTC) application for their Concrete Batch Plant to be operated near Mountain Home, Idaho. Non-site-specific air quality impact analyses involving atmospheric dispersion modeling of emissions associated with the concrete batch plant (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]). WI 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 WI 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); 5) 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 500 yd^3/day and 150,000 yd^3/year.	Short-term and annual modeling was performed assuming these rates.
Maintain a 460 foot (140 meter) setback distance between emissions points and the nearest ambient air boundary. If a diesel-fired generator is not used, the setback is 66 feet (20 meters).	This setback distance is necessary to assure compliance with applicable air quality standards, primarily 1-hour NO_2 impacts.
Co-contributing emissions sources such as HMA plants, other CBPs, or rock crushing plants will not locate on the plant property and within 1,000 feet of emissions points of the CBP, 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 simultaneously with the CBP 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 1,000 feet (305 meters) of each other. Once the CBP is established at the site, that CBP 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.
A diesel engine powering a generator: powered by an engine rated at <374 bph, having an EPA Tier 3 certification, and operating less than 12 hr/day.	Emissions are not greater than those listed in Table 7.
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.
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 generator, 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 stationary facility. The CBP will be located near Mountain Home, Idaho, which is 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 been promulgated by EPA. The standards became applicable for permitting purposes in Idaho when they were 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.

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 unless indicated otherwise.
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. The monitoring design value is used for background concentrations for $PM_{2.5}$ analyses. This approach is also used for the significant impact analysis.
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. For the significant impact analysis, the 5-year average of maximum modeled 1-hour impacts for each year is used.
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. For the significant impact analysis, the 5-year average of maximum modeled 1-hour impacts for each year is used.
t. 3-month rolling average.

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.

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-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.

Background $PM_{2.5}$ concentrations were based on monitoring performed in Idaho for 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 design value from all locations assessed. The

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

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 for 24-hour $PM_{2.5}$ 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 June 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	7.12
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.

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	49.8
2	48.1	10	48.1	18	61.8
3	45.7	11	39.5	19	70.4
4	46.2	12	32.6	20	85.9
5	46.7	13	34.3	21	79.0
6	54.9	14	34.3	22	75.5
7	56.7	15	37.8	23	63.5
8	60.1	16	46.4	24	49.8

a. micrograms per cubic meter.

3.0 Modeling Impact Assessment

3.1 Modeling Methodology

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

3.1.1 Overview of Analyses

The proposed project is a stationary CBP with a diesel-fired generator.

DEQ performed non-site-specific modeling to establish setback distances between locations of emissions points and the ambient air boundary of the CBP. DEQ's non-site-specific analyses were determined to be reasonably representative of the proposed CBP, and the results demonstrated compliance with applicable air quality standards to DEQ's satisfaction, provided the established setback distances are maintained.

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	Mountain Home	The CBP is not a portable facillity
Model	AERMOD	AERMOD with the PRIME downwash algorithm, version 11103.
Meteorological Data	Minidoka	Minidoka surface data and Boise upper air data. See Section 3.1.5.
Terrain	Flat	The analyses assumed flat terrain for the immediate area.
Building Downwash	Considered	Downwash was accounted for a small office.
Receptor Grid	Grid 1	Polar grid. 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. Because DEQ did not have information on facility layout, non-site-specific methods were used to establish setback distances between locations of emissions points and the ambient air boundary for the plant. Non-site-specific modeling was generally conducted using data and methods described in the *State of Idaho Air Quality Modeling Guideline.*

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.

The current version of AERMOD, version 11103, was used for the DEQ analyses to evaluate impacts of the CBP.

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 were 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 reasonably 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.

Table 6. PARAMETERS AND DATA FOR PVMRM		
Parameter	**Value**	**Source/Comments**
NO_2/NOx ratio for Emissions	0.318 for generator, 0.5 for the water heater	0.5 is an EPA suggested default when source-specific data are not available.
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

Minidoka surface meteorological data were used for the analyses, along with upper air data from Boise. Considering the site, these data are the most representative reasonably available data in model-ready format.

Representativeness of the meteorological data is a concern since Minidoka is fairly distant from Mountain Home. 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 dataset 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}, 1-hour NO_2, and 1-hour SO_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. The background NO_2 concentrations were conservatively based on monitoring data collected from Meridian, Idaho, near an interstate highway.

- The standard design value was used for 1-hour SO_2. The design value is the 5-year average of the 99th percentile of the annual distribution of maximum 1-hour modeled concentrations. The background SO_2 concentrations were based on the DEQ default 3-hour background concentration for rural-agricultural areas.

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 7 meters of the center of the facility.

3.1.8 Building Downwash

Potential downwash effects were accounted for by assuming the presence of a trailer-mounted office, represented in the model by a 6 meter by 6 meter structure, 4.1 meters 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

A polar grid with 10 meter receptor spacing, extending out to at least 200 meters, was used in the semi-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. Trigger values are the applicable standards, and the modeled impacts plus the applicable background concentration must be below these values in areas considered as ambient air.

2) For the operational configuration, pollutant, and averaging period, all receptors with concentrations (modeled value plus background) 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 and averaging period was identified. First, the receptor having a concentration in excess of the trigger value that was the furthest from any emissions source was identified. The controlling receptor was the next furthest downwind receptor from that point.

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

3.2 *Emission Rates*

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

3.2.1 Criteria Pollutant Emissions Rates

Table 7 lists criteria pollutant emissions rates used in the DEQ semi-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.

Table 7. EMISSIONS USED IN DEQ ANALYSES

Emissions Point in Model	Pollutant	Averaging Period	Emissions Rate (lb/hr) 500 cy/day[a] 150,000 cy/yr[a]
NGBOILER – natural gas or propane boiler ≤ 1.0 MMbtu/hr. Assume 8760 hr/yr	PM_{10}/ $PM_{2.5}$	24-hour	0.008743
		Annual	0.008743
	CO	1-hour 8-hour	0.09180
	SO_2	1-hour	0.01616
		24-hour	0.01616
		Annual	0.01616
	NO_x	1-hour	0.1639
		Annual	0.1639
GEN1 – electrical generator - 374 hp diesel engine - 12 hr/day - 0.0015% sulfur diesel - Tier 3 certified	PM_{10}/ $PM_{2.5}$	24-hour	0.0615[b]
		Annual	0.0615[b]
	CO	1-hour 8-hour	1.230[b]
	SO_2	1-hour	0.003966
		24-hour	0.001983[b]
		Annual	0.001983[b]
	NO_x	1-hour	2.459
		Annual	1.230[b]
SILO – cement storage silo	$PM_{2.5}$	24-hour	0.0006250
		Annual	0.0005137
	PM_{10}	24-hour	0.001739
SUPSILO – cement supplement storage silo	$PM_{2.5}$	24-hour	0.0009375
		Annual	0.0007705
	PM_{10}	24-hour	0.003725
WEIGHOP – aggregate weigh hopper loading. - controlled by baghouse	$PM_{2.5}$	24-hour	0.0002469
		annual	0.0002029
	PM_{10}	24-hour	0.0008233
TRUCKLOD – truck loadout. - controlled by boot and water spray	$PM_{2.5}$	24-hour	0.002938
		Annual	0.002414
	PM_{10}	24-hour	0.01633
AGG&SAND[c] – aggregate/sand handling at ground level	$PM_{2.5}$	24-hour	0.005923
		Annual	0.004869
	PM_{10}	24-hour	0.03912
AGGTOSTO[c] – aggregate/sand to elevated storage	$PM_{2.5}$	24-hour	0.002961
		Annual	0.002434
	PM_{10}	24-hour	0.01956

a. Cubic yards of concrete per day or year.
b. Hourly emissions multiplied by 12 hr/24 hr.
c. Emissions are varied in the model according to wind speed category. Emissions listed are based on a 10 mph wind speed.

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.

Emissions are well below DEQ modeling thresholds for annual NOx, for all CO averaging periods, and for all SO_2 averaging periods.

3.2.2 TAP Emissions Rates

Operation of the proposed CBP will result in an increase in allowable emissions of TAPs. The TAP emissions inventory generated by the permit writer indicated that emissions of all TAPs were below applicable ELs, thereby assuring compliance with TAP increments.

3.3 Emission Release Parameters and Plant Criteria

Table 8 lists the characteristics of the Atlas CBP used in DEQ's semi-site-specific air impact analyses.

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

Table 8. CHARACTERISTIC OF CBP PLANT USED IN DEQ ANALYSES

Parameter	Value or Description
Concrete Throughput Rates	500 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 simultaneously with the CBP and annual throughput is less than 500,000 ton/yr.
Cement and Supplement Storage Silo	Emissions captured and controlled by a baghouse or vent filter. Stack height ≥17.0 m for the cement silo and supplement silo, rain-capped release.
Aggregate Weigh Hopper Loading Stack Parameters	Emissions captured and controlled by a baghouse or vent filter. Stack height ≥3.0 m, stack diameter ≈ 1 m, rain-capped release.
Hot Water Boiler	Stack height ≥4.6 m, stack diameter ≈ 0.2 m, gas temp ≥450 K, flow velocity ≥7.5 m/sec.
Electrical Power	Line power or diesel-fired generators with the following characteristics: a generator powered by a 374 bhp, EPA Tier 3 certified engine, burning 0.0015% sultur fuel, operating less than 12 hr/day.
Generator Stack Parameters	Stack height ≥3.7 m, stack diameter ≈ 0.2 m, gas temp ≥800 K, flow velocity ≥44.6 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.

Table 9. 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	4.6	0.2	450	7.5
SILO	Point	17.0	0.3	Ambient	0.001[d]
SUPSILO	Point	17.0	0.3	Ambient	0.001[d]
WEIGHOP	Point	3.0	1.0	Ambient	0.001[d]
GEN1	Point	3.7	0.17	800	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.

3.4 *Results for Cumulative NAAQS Impact Analyses and TAPs Analyses*

DEQ determined required setback distances from the non-site-specific modeling results for each criteria pollutant and averaging period where facility-wide emissions exceeded DEQ modeling thresholds. 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). Table 8 provides a summary of setback distances for specific pollutants and averaging periods.

Table 10. SETBACK DISTANCES FOR SPECIFIC POLLUTANTS		
Pollutant	**Averaging Period**	**Setback Needed (meters)**
$PM_{2.5}$	24-hour	<20
	annual	<20
PM_{10}	24-hour	<20
NO_2	1-hour	140 (<20 if a generator is not used)

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 1-hour NO_2 impacts, followed by 24-hour PM_{10} and $PM_{2.5}$ impacts, are the governing criteria 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 simultaneously operate with the rock crushing plant and the annual actual throughput of the rock crushing plant is not greater than 500,000 tons.

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.

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 factor for aggregate – use 10 mph wind:

$PM_{2.5}$

$$0.053\ (0.0032)\frac{(10/5)^{1.3}}{(1.77/2)^{1.4}} = 4.955\,E-4 \quad \text{lb/ton}$$

PM_{10}

$$0.35\ (0.0032)\frac{(10/5)^{1.3}}{(1.77/2)^{1.4}} = 3.272\,E-3 \quad \text{lb/ton}$$

Base factor for sand – use 10 mph wind:

$PM_{2.5}$

$$0.053\ (0.0032)\frac{(10/5)^{1.3}}{(4.17/2)^{1.4}} = 1.493\ E-4 \quad lb/ton$$

PM_{10}

$$0.35\ (0.0032)\frac{(10/5)^{1.3}}{(4.17/2)^{1.4}} = 9.858\ E-4 \quad lb/ton$$

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, fraction of sand = 1428 lb / 4024 lb = 0.3549

Base factor for aggregate in terms of lb/yd^3

$PM_{2.5}$

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

PM_{10}

$$\frac{3.272\ E-3\ lb\ PM_{2.5}}{ton} \left| \frac{0.4635\ ton\ agg}{ton\ concrete} \right| \frac{ton}{2000\ lb} \left| \frac{4024\ lb\ conc.}{yd^3} \right. = \frac{3.052\ E-3\ lb\ PM_{10}}{yd^3}$$

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

$PM_{2.5}$

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

PM_{10}

$$\frac{3.052\text{ E-3 lb } PM_{2.5}}{yd^3} \mid (1\text{-}0.75) = \frac{7.629\text{ E-4 lb } PM_{10}}{yd^3}$$

Using the same process for sand handling, the $PM_{2.5}$ controlled emissions factor is 2.665 E-5 lb $PM_{2.5}/yd^3$ and the PM_{10} factor is 1.760 E-4 lb PM_{10}/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 500 cy/day concrete and 150,000 cy/year concrete, emissions from aggregate and sand transfers at ground level are as follows:

Daily $PM_{2.5}$:

$$\frac{1.155\text{ E-4 lb} + 2.665\text{ E-5 lb}}{yd^3\text{ - transfer}} \mid 2\text{ transfers} \mid \frac{500\ yd^3}{day} \mid \frac{day}{24\text{ hour}} = \frac{0.005923\text{ lb } PM_{2.5}}{hr}$$

Daily PM_{10}:

$$\frac{7.629\text{ E-4 lb} + 1.760\text{ E-4 lb}}{yd^3\text{ - transfer}} \mid 2\text{ transfers} \mid \frac{500\ yd^3}{day} \mid \frac{day}{24\text{ hour}} = \frac{0.03912\text{ lb } PM_{10}}{hr}$$

Annual $PM_{2.5}$:

$$\frac{1.155\text{ E-4 lb} + 2.665\text{ E-5 lb}}{yd^3\text{ - transfer}} \mid 2\text{ transfers} \mid \frac{150{,}000\ yd^3}{year} \mid \frac{year}{8760\text{ hour}} = \frac{0.004869\text{ lb } PM_{2.5}}{hr}$$

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

For the operational scenario for 500 cy/day concrete and 150,000 cy/year concrete, emissions from aggregate and sand transfers to elevated storage are as follows:

Daily $PM_{2.5}$:

$$\frac{1.155\text{ E-4 lb} + 2.665\text{ E-5 lb}}{yd^3\text{ - transfer}} \mid 1\text{ transfers} \mid \frac{500\ yd^3}{day} \mid \frac{day}{24\text{ hour}} = \frac{0.002961\text{ lb } PM_{2.5}}{hr}$$

Daily PM_{10}:

$$\frac{7.629\text{ E-4 lb} + 1.760\text{ E-4 lb}}{yd^3\text{ - transfer}} \mid 1\text{ transfers} \mid \frac{500\ yd^3}{day} \mid \frac{day}{24\text{ hour}} = \frac{0.01956\text{ lb } PM_{10}}{hr}$$

Annual $PM_{2.5}$:

$$\frac{1.155\text{ E-4 lb} + 2.665\text{ E-5 lb}}{yd^3\text{ - transfer}} \times \frac{1\text{ transfers}}{} \times \frac{150{,}000\ yd^3}{\text{year}} \times \frac{\text{year}}{8760\text{ hour}} = \frac{0.002434\text{ lb } PM_{2.5}}{\text{hr}}$$

Truck Loading

Emissions as calculated by a DEQ spreadsheet – see Statement of Basis

Weigh Hopper Loading

Emissions as calculated by a DEQ spreadsheet – see Statement of Basis

Loading of Cement Silo

Emissions as calculated by a DEQ spreadsheet – see Statement of Basis

Loading of Cement Supplement Silo

Emissions as calculated by a DEQ spreadsheet – see Statement of Basis

Natural Gas Boiler

Hot water boiler fueled by propane: 1.0 MMbtu/hr. Emissions calculated from DEQ CBP spreadsheet. Maximum hourly emissions used for 24 hour/day and 8760 hour/year.

Emissions as calculated by a DEQ spreadsheet – see Statement of Basis

Diesel-fired Generator

Generator powered by a 374 hp diesel engine, EPA Tier 3 Certification.

Emissions as calculated by a DEQ spreadsheet – see Statement of Basis. Emissions were modeled assuming a maximum of 12 hr/day and 365 day/yr operation.

CBP Modeling Parameters

Cement and Supplement Silo Filling Baghouse Stacks

Release height = 17.0 meters cement silo, 17.0 meters supplement silo; effective diameter of release area = 0.3 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.