Statement of Basis
Concrete Batch Plant General Permit

Permit to Construct No. P-2015.0021
Project ID 61621

Kloepfer Inc. 067-00019
Paul, Idaho

Facility ID 067-00019

Final

November 16, 2017
Morrie Lewis
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
AACC	acceptable ambient concentrations for carcinogens
acfm	actual cubic feet per minute
CAA	Clean Air Act
CBP	concrete batch plant
CFR	Code of Federal Regulations
CO	carbon monoxide
CO_2e	carbon dioxide equivalent emissions
DEQ	Department of Environmental Quality
EL	screening emission levels
EPA	U.S. Environmental Protection Agency
GHG	greenhouse gases
HAP	hazardous air pollutants
hr/yr	hours per consecutive 12-calendar-month period
IDAPA	a numbering designation for all administrative rules in Idaho promulgated in accordance with the Idaho Administrative Procedures Act
lb/hr	pounds per hour
lb/qtr	pound per quarter
MACT	Maximum Achievable Control Technology
MMBtu	million British thermal units
MMscf	million standard cubic feet
NAAQS	National Ambient Air Quality Standard
NESHAP	National Emission Standards for Hazardous Air Pollutants
NO_2	nitrogen dioxide
NO_x	nitrogen oxides
NSPS	New Source Performance Standards
PAH	polycyclic aromatic hydrocarbons
PM	particulate matter
$PM_{2.5}$	particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers
PM_{10}	particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers
POM	polycyclic organic matter
PSD	Prevention of Significant Deterioration
PTC	permit to construct
PTE	potential to emit
PW	process weight rate
Rules	*Rules for the Control of Air Pollution in Idaho*
SCL	significant contribution limits
SIP	State Implementation Plan
SM	synthetic minor
SM80	synthetic minor facility with emissions greater than or equal to 80% of a major source threshold
SO_2	sulfur dioxide
T/yr	tons per consecutive 12 calendar month period
TAP	toxic air pollutants
TEQ	toxicity equivalent
VOC	volatile organic compounds
yd^3	cubic yards
$\mu g/m^3$	micrograms per cubic meter

FACILITY INFORMATION

Description

Kloepfer Inc. 067-00019 has proposed a new stationary truck mix concrete batch plant consisting of aggregate stockpiles, a cement storage silo, a cement supplement (fly ash) storage silo, a weigh batcher, and conveyors. The facility combines aggregate, sand, fly ash, and cement and then transfers the mixture into a truck mixer, along with water, for in-transit mixing of the concrete. In addition, water heater(s) are used to heat the water in cold weather prior to use for the mixing of concrete.

The concrete batch plant will be fed a mixture of aggregates from imported aggregate.

The process begins with materials being fed via front end loader to a compartment bin feeder system and then dispensed in metered proportions to a collecting conveyor. The material will pass over a scalping screen before being conveyed into the truck mixer.

Particulate emissions will be controlled by maintaining the moisture content at 1.5% by weight for all ¼ in and smaller aggregate feed materials via water sprays.

The applicant has proposed concrete production rate throughput limits of 110 cubic yards per hour, 1,000 cubic yards per day, and 45,900 cubic yards per year. Note: Annual concrete production is limited to 45,900 cubic yards per year as a requirement of applying for the Concrete Batch Plant General Permit.

The applicant has proposed that line power will be used exclusively at the facility. Therefore, no IC engines powering electrical generators were included in the application.

Permitting History

This is the initial PTC for an existing facility that was constructed in 1954 thus there is no permitting history.

Application Scope

This is the initial PTC for an existing facility that was constructed in 1954.

Application Chronology

November 2, 2015	DEQ received an application, application fee and general permit processing fee.
November 9 – 24, 2015	DEQ provided an opportunity to request a public comment period on the application and proposed permitting action.
December 2, 2015	DEQ determined that the application was complete.
August 28, 2017	DEQ made available the draft permit and statement of basis for peer and regional office review.
September 1, 2017	DEQ made available the draft permit and statement of basis for applicant review.
October 2 – November 1, 2017	DEQ provided a public comment period on the proposed action.
November 16, 2017	DEQ issued the final permit and statement of basis.

TECHNICAL ANALYSIS

Emissions Units and Control Equipment

Table 1 EMISSIONS UNIT AND CONTROL EQUIPMENT INFORMATION

Source ID No.	Sources	Control Equipment
Materials Handling	Material Transfer Points: Materials handling Concrete aggregate transfers Truck unloading of aggregate Aggregate conveyor transfers Aggregate handling	Maintaining the moisture content in ¼" or smaller aggregate material at 1.5% by weight, using water sprays, using shrouds, or other emissions controls
Concrete Mixer	Concrete Batch Plant – Truck Mix: Manufacturer: Belgrade/Cardinal Model: 748 Manufacture Date: Dec. 1995 Max. production: 110 yd^3/hr, 1,000 yd^3/day, and 45,900 yd^3/yr Cement Storage Silo: Baghouse Manufacturer[a]: Belgrade Steel Tank Co. Model: Belle 225 Fly Ash Storage Silo: Baghouse Manufacturer[a]: Belgrade Steel Tank Co. Model: Belle 225	Cement Storage Silo Baghouse No. 1: Manufacturer: Belgrade Steel Tank Co. Model: Belle 225 $PM_{10}/PM_{2.5}$ control efficiency: 99% Truck Load-out Shroud: Control: Shroud $PM_{10}/PM_{2.5}$ control efficiency: 75% Material Transfer Points: $PM_{10}/PM_{2.5}$ control efficiency: 75%
Boiler	Boiler: Manufacturer: Raypack Model: 9307109126 Manufacture Date: July 1993 Heat input rating: 3.0 MMBtu/hr Fuel: Natural Gas	N/A

a. 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

Potential to Emit

IDAPA 58.01.01 defines Potential to Emit as the maximum capacity of a facility or stationary source to emit an air pollutant under its physical and operational design. Any physical or operational limitation on the capacity of the facility or source to emit an air pollutant, including air pollution control equipment and restrictions on hours of operation or on the type or amount of material combusted, stored or processed, shall be treated as part of its design if the limitation or the effect it would have on emissions is state or federally enforceable. Secondary emissions do not count in determining the potential to emit of a facility or stationary source.

Using this definition of Potential to Emit an emission inventory was developed for the concrete batch plant operations at the facility associated with this proposed project using the DEQ developed CBP EI spreadsheet (see Appendix A). Emissions estimates of criteria pollutant PTE were based on the following assumptions:

- Maximum concrete throughput does not exceed 1,000 yd^3/day and 45,900 yd^3/year (per the applicant).
- Fugitive emissions of particulate matter (PM), PM_{10}, and $PM_{2.5}$ from the concrete batch plant material transfer points were assumed to be controlled by manual water sprays, sprinklers, or spray bars, or an equivalent method that reduce PM 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 concrete 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, 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 75%.
- Controlled emissions of particulate toxic air pollutants (TAP) were estimated based on the presence of a baghouse on the cement/cement supplement silos, a baghouses/cartridge on the weigh batcher, and 75% 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.
- 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 three transfer points.
- Any emissions unit outside a 1,000 ft radius from the concrete batch plant was not included in the emissions modeling analysis for this project.

[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%.

Uncontrolled Potential to Emit

Using the definition of Potential to Emit, uncontrolled Potential to Emit is then defined as the maximum capacity of a facility or stationary source to emit an air pollutant under its physical and operational design. Any physical or operational limitation on the capacity of the facility or source to emit an air pollutant, including air pollution control equipment and restrictions on hours of operation or on the type or amount of material combusted, stored or processed, shall **not** be treated as part of its design **since** the limitation or the effect it would have on emissions **is not** state or federally enforceable.

The uncontrolled Potential to Emit is used to determine if a facility is a "Synthetic Minor" source of emissions. Synthetic Minor sources are facilities that have an uncontrolled Potential to Emit for regulated air pollutants or HAP above the applicable Major Source threshold without permit limits.

The following table presents the uncontrolled Potential to Emit for regulated air pollutants from all emissions units at the facility as determined by DEQ staff using the DEQ Concrete Batch Plant EI spreadsheet. See Appendix A – Emission Inventories for a detailed presentation of the calculations and the assumptions used to determine emissions for each emissions unit. For this operation uncontrolled Potential to Emit is calculated with 0% control efficiency for the Concrete Batch Plant itself.

Table 2 UNCONTROLLED POTENTIAL TO EMIT FOR REGULATED AIR POLLUTANTS

Source	$PM_{10}/PM_{2.5}$	SO_2	NO_x	CO	VOC
	T/yr	T/yr	T/yr	T/yr	T/yr
Concrete batch plant	4.05	0.00	0.00	0.00	0.00
Boiler	0.03	0.0035	0.59	0.49	0.032
Materials handling	0.28	0.00	0.00	0.00	0.00
Total, Point Sources	**4.36**	**0.004**	**0.59**	**0.49**	**0.03**

The following table presents the uncontrolled Potential to Emit for HAP pollutants from all emissions units at the facility as determined by DEQ staff using the DEQ Concrete Batch Plant EI spreadsheet. See Appendix A – Emission Inventories for a detailed presentation of the calculations and the assumptions used to determine emissions for each emissions unit. For this operation uncontrolled Potential to Emit is calculated with 0% control efficiency for the Concrete Batch Plant itself.

Table 3 UNCONTROLLED POTENTIAL TO EMIT FOR HAZARDOUS AIR POLLUTANTS

IDAPA Listing	Hazardous Air Pollutants	PTE (T/yr)
585	Acrolein	0.0
	Chromium metal (II and III)	8.24E-05
	Cobalt metal dust, and fume	3.71E-07
	Ethyl benzene	0.0
	Hexane	7.94E-03
	Manganese as Mn (fume)	3.93E-04
	Mercury (alkyl compounds as Hg)	1.15E-06
	Methyl chloroform	0.0
	Naphthalene	2.81E-07
	Phosphorous	2.53E-04
	Propionaldehyde	0.0
	Quinone	0.0
	Selenium	1.69E-05
	Toluene	1.50E-05
	Xylene	0.0
586	Acetaldehyde	0.0
	Arsenic	8.03E-05
	Benzene	9.66E-07
	Benzo(a)pyrene	5.52E-10
	Beryllium and compounds	1.81E-06
	1,3-Butadiene	0.0
	Cadmium and compounds	7.86E-07
	Chromium (VI)	3.77E-06
	Formaldehyde	3.45E-05
	3-Methylcholanthrene	8.28E-10
	Nickel	2.60E-04
Not listed	Acenaphthene	8.28E-10
	Acenaphthylene	8.28E-10
	Anthracene	1.10E-09
	Benzo(b)fluoranthene	8.28E-10
	Benzo(k)fluoranthene	8.28E-10
	Benzo(e)pyrene	0.0
	Benzo(g,h,l)perylene	5.52E-10
	Chrysene	8.28E-10
	Dibenzo(a,h)anthracene	5.52E-10
	Isooctane	0.0
	Total	**0.0091**

Pre-Project Potential to Emit

Pre-project Potential to Emit is used to establish the change in emissions at a facility as a result of this project.

This is an existing facility. However, since this is the first time the facility is receiving a permit, pre-project emissions are set to zero for all criteria pollutants.

Post-Project Potential to Emit

Post-project Potential to Emit is used to establish the change in emissions at a facility and to determine the facility's classification as a result of this project. Post-project Potential to Emit includes all permit limits resulting from this project.

The following table presents the post-project Potential to Emit for criteria and GHG pollutants from all emissions units at the facility as determined by DEQ staff using the DEQ Concrete Batch Plant EI spreadsheet. See Appendix A – Emission Inventories for a detailed presentation of the calculations of these emissions for each emissions unit.

Table 4 POST-PROJECT POTENTIAL TO EMIT FOR REGULATED AIR POLLUTANTS

Source	$PM_{10}/PM_{2.5}$		SO_2		NO_X		CO		VOC	
	lb/hr[a]	T/yr[b]	lb/hr[a]	T/yr[b]	lb/hr[a]	T/yr[b]	lb/hr[a]	T/yr[b]	lb/hr[a]	T/yr[b]
Concrete batch plant	0.41	1.79	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Boiler	0.030	0.045	0.0024	0.0035	0.392	0.588	0.329	0.494	0.022	0.032
Materials handling	0.12	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Post-Project Totals	**0.56**	**1.92**	**0.002**	**0.004**	**0.39**	**0.59**	**0.33**	**0.49**	**0.02**	**0.03**

a) Controlled average emission rate in pounds per hour is a daily average, based on the proposed daily operating schedule and daily limits.
b) Controlled average emission rate in tons per year is an annual average, based on the proposed annual operating schedule and annual limits.

Change in Potential to Emit

The change in facility-wide potential to emit is used to determine if a public comment period may be required and to determine the processing fee per IDAPA 58.01.01.225. The following table presents the facility-wide change in the potential to emit for criteria pollutants.

Table 5 CHANGES IN POTENTIAL TO EMIT FOR REGULATED AIR POLLUTANTS

Source	$PM_{10}/PM_{2.5}$		SO_2		NO_X		CO		VOC	
	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr
Pre-Project PTE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Post-Project PTE	0.56	1.92	0.002	0.004	0.39	0.59	0.33	0.49	0.02	0.03
Changes in Potential to Emit	**0.56**	**1.92**	**0.002**	**0.004**	**0.39**	**0.59**	**0.33**	**0.49**	**0.02**	**0.03**

Non-Carcinogenic TAP Emissions

Pre- and post-project, as well as the change in, non-carcinogenic TAP emissions are presented in the following table:

Table 6 PRE- AND POST-PROJECT POTENTIAL TO EMIT FOR NON-CARCINOGENIC TOXIC AIR POLLUTANTS

Non-Carcinogenic Toxic Air Pollutants	Pre-Project 24-hour Average Emissions Rates for Units at the Facility (lb/hr)	Post-Project 24-hour Average Emissions Rates for Units at the Facility (lb/hr)	Change in 24-hour Average Emissions Rates for Units at the Facility (lb/hr)	Non-Carcinogenic Screening Emission Level (lb/hr)	Exceeds Screening Level? (Y/N)
Acrolein	0.0	0.00	0.0000	**0.017**	No
Barium	0.0	9.71E-06	0.000010	**2**	No
Chromium metal (II and III)	0.0	4.94E-05	0.00005	**0.033**	No
Cobalt metal dust, and fume	0.0	1.85E-07	0.0000002	**0.0033**	No
Copper (fume)	0.0	1.88E-06	0.00000188	**0.013**	No
Ethyl benzene	0.0	0.00	0.0000	**29**	No
Hexane	0.0	3.97E-03	0.0040	**12**	No
Manganese as Mn (fume)	0.0	1.84E-04	0.0002	**0.067**	No
Mercury (alkyl compounds as Hg)	0.0	5.74E-07	0.0000006	**0.001**	No
Methyl chloroform	0.0	0.00	0.0000	**127**	No
Methyl ethyl ketone (MEK)	0.0	0.00	0.0000	**39.3**	No
Molybdenum (soluble)	0.0	2.43E-06	0.000002	**0.333**	No
Naphthalene	0.0	2.24E-04	0.0002	**3.33**	No
Pentane	0.0	3.53E-03	0.0035	**118**	No
Phosphorous	0.0	1.49E-04	0.0001	**0.007**	No
Propionaldehyde	0.0	0.00	0.0000	**0.0287**	No
Quinone	0.0	0.00	0.0000	**0.027**	No
Selenium	0.0	7.86E-06	0.0000079	**0.013**	No
Toluene	0.0	7.50E-06	0.000008	**25**	No
Vanadium as V_2O_5, (respirable dust and fume)	0.0	5.07E-06	0.0000051	**0.003**	No
Xylene	0.0	0.00	0.0000	**29**	No
Zinc metal	0.0	6.403E-05	0.000064	**0.667**	No

None of the PTEs for non-carcinogenic TAP were exceeded as a result of this project. Therefore, modeling is not required for any non-carcinogenic TAP because none of the 24-hour average carcinogenic screening ELs identified in IDAPA 58.01.01.586 were exceeded.

Carcinogenic TAP Emissions

Pre- and post-project, as well as the change in, non-carcinogenic TAP emissions are presented in the following table:

Table 7 PRE- AND POST-PROJECT POTENTIAL TO EMIT FOR CARCINOGENIC TOXIC AIR POLLUTANTS

Carcinogenic Toxic Air Pollutants	Pre-Project Annual Average Emissions Rates for Units at the Facility (lb/hr)	Post-Project Annual Average Emissions Rates for Units at the Facility (lb/hr)	Change in Annual Average Emissions Rates for Units at the Facility (lb/hr)	Carcinogenic Screening Emission Level (lb/hr)	Exceeds Screening Level? (Y/N)
Acetaldehyde	0.00	0.00	0.0000	**3.0E-03**	No
Arsenic	**0.00**	**6.85E-06**	**0.000007**	**1.5E-06**	**Yes**
Benzene	0.00	2.82E-06	0.0000028	**8.0E-04**	No
Benzo(a)pyrene	0.00	1.21E-09	0.0000000012	**2.0E-06**	No
Beryllium and compounds	0.00	1.65E-07	0.0000002	**2.8E-05**	No
1,3-Butadiene	0.00	0.00	0.000000	**2.4E-05**	No
Cadmium and compounds	0.00	1.55E-06	0.000002	**3.7E-06**	No
Chromium (VI)	**0.00**	**1.38E-06**	**0.000001**	**5.6E-07**	**Yes**
Formaldehyde	0.00	7.55E-05	0.0001	**5.1E-04**	No
3-Methylcholanthrene	0.00	1.81E-09	0.000000002	**2.5E-06**	No
Nickel	0.00	9.02E-06	0.000009	**2.7E-05**	No
PAH Total	0.00	1.15E-08	0.0000	**9.1E-05**	No
POM Total	0.00	1.15E-08	0.00000001	**2.0E-06**	No

a) Polycyclic Organic Matter (POM) is considered as one TAP comprised of: benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, dibenzo(a,h)anthracene, chrysene, indeno(1,2,3-cd)pyrene, benzo(a)pyrene. The total is compared to benzo(a)pyrene.

Some of the PTEs for carcinogenic TAP were exceeded as a result of this project. Therefore, modeling is required for arsenic and chromium (VI) because the annual average carcinogenic screening ELs identified in IDAPA 58.01.01.586 were exceeded.

Post-Project HAP Emissions

The following table presents the post-project potential to emit for HAP pollutants from all emissions units at the facility/for the one unit being modified as submitted by the applicant and verified by DEQ staff. See Appendix A – Emission Inventories for a detailed presentation of the calculations of these emissions for each emissions unit.

Table 8 HAZARDOUS AIR POLLUTANTS EMISSIONS POTENTIAL TO EMIT SUMMARY

IDAPA Listing	Hazardous Air Pollutants	PTE (T/yr)
585	Acrolein	0.0
	Chromium metal (II and III)	8.24E-05
	Cobalt metal dust, and fume	3.71E-07
	Ethyl benzene	0.0
	Hexane	7.94E-03
	Manganese as Mn (fume)	3.93E-04
	Mercury (alkyl compounds as Hg)	1.15E-06
	Methyl chloroform	0.0
	Naphthalene	2.81E-07
	Phosphorous	2.53E-04
	Propionaldehyde	0.0
	Quinone	0.0
	Selenium	1.69E-05
	Toluene	1.50E-05
	Xylene	0.0
586	Acetaldehyde	0.0
	Arsenic	8.03E-05
	Benzene	9.66E-07
	Benzo(a)pyrene	5.52E-10
	Beryllium and compounds	1.81E-06
	1,3-Butadiene	0.0
	Cadmium and compounds	7.86E-07
	Chromium (VI)	1.65E-05
	Formaldehyde	3.45E-05
	3-Methylcholanthrene	8.28E-10
	Nickel	8.35E-05
Not listed	Acenaphthene	8.28E-10
	Acenaphthylene	8.28E-10
	Anthracene	1.10E-09
	Benzo(b)fluoranthene	8.28E-10
	Benzo(k)fluoranthene	8.28E-10
	Benzo(e)pyrene	0.0
	Benzo(g,h,l)perylene	5.52E-10
	Chrysene	8.28E-10
	Dibenzo(a,h)anthracene	5.52E-10
	Isooctane	0.0
	Total	**0.0089**
	Total	**0.0079**

The estimated PTE for all federally listed HAP combined is below 25 T/yr and no PTE for a federally listed HAP exceeds 10 T/yr. Therefore, this facility is not a Major Source for HAP.

Ambient Air Quality Impact Analyses

As presented in the Modeling Memo in Appendix B, the estimated emission rates of $PM_{2.5}$, PM_{10}, SO_2, NO_x, CO, VOC, HAP, and TAP from this project were below applicable screening emission levels (EL) and published DEQ modeling thresholds established in IDAPA 58.01.01.585-586 and in the State of Idaho Air Quality Modeling Guideline.[3] Refer to the Emissions Inventories section for additional information concerning the emission inventories.

[3] Criteria pollutant thresholds in Table 1, State of Idaho Air Quality Modeling Guideline, Doc ID AQ-011, rev. 1, December 31, 2002.

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

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

As a result of the ambient air quality impact analysis, as well as information submitted by the applicant for specific operating scenarios, the following conditions (along with corresponding monitoring and record keeping requirements) were placed in the permit:

- The Emissions Limits permit condition,
- The Concrete Production Limits permit condition,

REGULATORY ANALYSIS

Attainment Designation (40 CFR 81.313)

The facility is located in Minidoka County, which is designated as attainment or unclassifiable for $PM_{2.5}$, PM_{10}, SO_2, NO_2, CO, and Ozone. Refer to 40 CFR 81.313 for additional information.

Facility Classification

The AIRS/AFS facility classification codes are as follows:

For THAP (Total Hazardous Air Pollutants) Only:

A = Use when any one HAP has actual or potential emissions ≥ 10 T/yr or if the aggregate of all HAP (Total HAP) has actual or potential emissions ≥ 25 T/yr.

SM80 = Use if a synthetic minor (potential emissions fall below applicable major source thresholds if and only if the source complies with federally enforceable limitations) and the permit sets limits ≥ 8 T/yr of a single HAP or ≥ 20 T/yr of THAP.

SM = Use if a synthetic minor (potential emissions fall below applicable major source thresholds if and only if the source complies with federally enforceable limitations) and the potential HAP emissions are limited to < 8 T/yr of a single HAP and/or < 20 T/yr of THAP.

B = Use when the potential to emit without permit restrictions is below the 10 and 25 T/yr major source threshold

UNK = Class is unknown

For All Other Pollutants:

A = Actual or potential emissions of a pollutant are ≥ 100 T/yr.

SM80 = Use if a synthetic minor for the applicable pollutant (potential emissions fall below 100 T/yr if and only if the source complies with federally enforceable limitations) and potential emissions of the pollutant are ≥ 80 T/yr.

SM = Use if a synthetic minor for the applicable pollutant (potential emissions fall below 100 T/yr if and only if the source complies with federally enforceable limitations) and potential emissions of the pollutant are < 80 T/yr.

B = Actual and potential emissions are < 100 T/yr without permit restrictions.

UNK = Class is unknown.

Table 9 REGULATED AIR POLLUTANT FACILITY CLASSIFICATION

Pollutant	Uncontrolled PTE (T/yr)	Permitted PTE (T/yr)	Major Source Thresholds (T/yr)	AIRS/AFS Classification
PM	4.36	1.92	**100**	B
$PM_{10}/PM_{2.5}$	4.36	1.92	**100**	B
SO_2	0.004	0.004	**100**	B
NO_x	0.59	0.59	**100**	B
CO	0.49	0.49	**100**	B
VOC	0.03	0.03	**100**	B
HAP (single)	0.0079	0.0079	**10**	B
HAP (Total)	0.0089	0.0089	**25**	B

Permit to Construct (IDAPA 58.01.01.201)

IDAPA 58.01.01.201 Permit to Construct Required

The permittee has requested that a PTC be issued for this existing facility. Since the facility commissioned before January 30, 1969, it was previously a grandfathered emissions source. However, based on information from the applicant, several equipment changes have been implemented since January 30, 1969. Therefore, a permit to construct was required to be issued in accordance with IDAPA 58.01.01.220. 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)

IDAPA 58.01.01.401 Tier II Operating Permit

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

Visible Emissions (IDAPA 58.01.01.625)

IDAPA 58.01.01.624 Visible Emissions

The sources of PM_{10} emissions at this facility are subject to the State of Idaho visible emissions standard of 20% opacity. This requirement is assured by Permit Condition 3.4.

Fugitive Emissions (IDAPA 58.01.01.650)

IDAPA 58.01.01.650 Rules for the Control of Fugitive Emissions

The sources of fugitive emissions at this facility are subject to the State of Idaho fugitive emissions standards. These requirements are assured by Permit Conditions 2.1 and 2.2.

Particulate Matter – New Equipment Process Weight Limitations (IDAPA 58.01.01.701)

IDAPA 58.01.01.701 Particulate Matter – New Equipment Process Weight Limitations

IDAPA 58.01.01.700 through 703 set PM emission limits for process equipment based on when the piece of equipment commenced operation and the piece of equipment's process weight (PW) in pounds per hour (lb/hr). IDAPA 58.01.01.701 and IDAPA 58.01.01.702 establish PM emission limits for equipment that commenced operation on or after October 1, 1979 and for equipment operating prior to October 1, 1979, respectively.

For equipment that commenced operation on or after October 1, 1979, the PM allowable emission rate (E) is based on one of the following four equations:

IDAPA 58.01.01.701.01.a: If PW is $< 9{,}250$ lb/hr; $E = 0.045\ (PW)^{0.60}$

IDAPA 58.01.01.701.01.b: If PW is $\geq 9{,}250$ lb/hr; $E = 1.10\ (PW)^{0.25}$

For equipment that commenced prior to October 1, 1979, the PM allowable emission rate is based on one of the following equations:

IDAPA 58.01.01.702.01.a: If PW is < 17,000 lb/hr; $E = 0.045 (PW)^{0.60}$

IDAPA 58.01.01.702.01.b: If PW is ≥ 17,000 lb/hr; $E = 1.12 (PW)^{0.27}$

As discussed previously in the Emissions Inventory Section, concrete has a density of 4,024 lb per cubic yard. Thus, for the new Concrete Batch Plant proposed to be installed as a result of this project with a proposed throughput of 110 yd^3/hr, E is calculated as follows:

Proposed throughput = 4,024 lb per cubic yard x 110 yd^3/hr = 442,640 lb/hr

Therefore, E is calculated as:

$E = 1.10 \times PW^{0.25} = 1.10 \times (442,640)^{0.25} = 28.4$ lb-PM/hr

As presented previously in the Emissions Inventories Section of this evaluation the post-project PTE for this emissions unit is 0.41 lb-PM_{10}/hr. Assuming PM is 50% PM_{10} means that PM emissions will be 0.82 lb-PM/hr (0.04 lb-PM_{10}/hr ÷ 0.5 lb-PM_{10}/lb-PM). Therefore, compliance with this requirement has been demonstrated.

Rules for Control of Odors (IDAPA 58.01.01.775)

IDAPA 58.01.01.750 Rules for Control of Odors

Section 776.01 states that 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. These requirements are assured by Permit Conditions 2.3 and 2.5.

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

IDAPA 58.01.01.301 Requirement to Obtain Tier I Operating Permit

Post-project facility-wide emissions from this facility do not have a potential to emit greater than 100 tons per year for all criteria pollutants or 10 tons per year for any one HAP or 25 tons per year for all HAP as demonstrated previously in the Emissions Inventories Section of this analysis. Therefore, the facility is not a Tier I source in accordance with IDAPA 58.01.01.006 and the requirements of IDAPA 58.01.01.301 do not apply.

PSD Classification (40 CFR 52.21)

40 CFR 52.21 Prevention of Significant Deterioration of Air Quality

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/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 not subject to any NSPS requirements 40 CFR Part 60.

NESHAP Applicability (40 CFR 61)

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

MACT Applicability (40 CFR 63)

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

Permit Conditions Review

This section describes the permit conditions for this initial permit or only those permit conditions that have been added, revised, modified or deleted as a result of this permitting action.

Permit condition 1.1 establishes the permit to construct scope.

Permit condition 1.2, Table 1.1, provides a description of the purpose of the permit and the regulated sources, the process, and the control devices used at the facility.

Facility-Wide Conditions

As discussed previously, permit condition 2.1 establishes that the permittee shall take all reasonable precautions to prevent fugitive particulate matter (PM) from becoming airborne and provides examples of the controls in accordance with IDAPA 58.01.01.650-651.

As discussed previously, permit condition 2.2 establishes that the concrete batch plant shall employ efficient fugitive dust controls and provides examples of the controls in accordance with IDAPA 58.01.01.808.01 and 808.02.

As discussed previously, permit condition 2.3 establishes that there are to be no emissions of odorous gases, liquids, or solids from the permit equipment into the atmosphere in such quantities that cause air pollution.

As discussed previously, permit condition 2.4 establishes that the permittee shall monitor fugitive dust emissions on a daily basis to demonstrate compliance with the facility-wide permit requirements.

As discussed previously, permit condition 2.5 establishes that the permittee monitor and record odor complaints to demonstrate compliance with the facility-wide permit requirements.

Permit Condition 2.6 establishes that the permittee shall maintain records as required by the Recordkeeping General Provision.

Concrete Batch Plant Equipment

Permit condition 3.1 provides a process description of the concrete production process at this facility.

Permit condition 3.2 provides a description of the control devices used on the concrete production equipment at this facility.

Permit condition 3.3 establishes hourly and annual emissions limits for $PM_{2.5}$, SO_2, NO_X, CO, and VOC emissions from the concrete production operation at this facility.

As discussed previously, Permit Condition 3.4 establishes a 20% opacity limit for the concrete batch plant baghouse and the boiler stacks or functionally equivalent openings associated with the concrete production operation.

Permit Condition 3.5 establishes a daily and an annual concrete production limit for the concrete production operation as proposed by the applicant.

Permit condition 3.6 requires that the applicant employ a boot or shroud to control emissions from the truck/central loadout operation as proposed by the applicant.

Permit condition 3.7 requires that the applicant employ a baghouse to control emissions from the truck loadout operation as proposed by the applicant.

Permit condition 3.8 establishes that the Permittee monitor and record hourly and daily concrete production to demonstrate compliance with the Concrete Production Limits permit condition.

Permit condition 3.9 establishes that the Permittee shall establish procedures for operating the baghouse. This is a DEQ imposed standard requirement for operations using baghouses to control particulate emissions.

Permit Condition 3.10 establishes that the permittee shall maintain records as required by the Recordkeeping General Provision.

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 comments on the application and there was a request for a public comment period on DEQ's proposed action. Refer to the chronology for public comment opportunity dates.

Public Comment Period

A public comment period was made available to the public in accordance with IDAPA 58.01.01.209.01.c. During this time, comments were submitted in response to DEQ's proposed action. Refer to the chronology for public comment period dates.

A response to public comments document has been crafted by DEQ based on comments submitted during the public comment period. That document is part of the final permit package for this permitting action.

APPENDIX A – EMISSION INVENTORIES

Final Concrete Batch Plant Emissions Inventory

Listed Below are the emissions estimates for the units selected.

Company:	Kloepfer Inc 067-00019
Facility ID:	067-00019
Permit No.:	P-2015.0021 Project 61621
Source Type:	Portable Concrete Batch Plant
Manufacturer/Model:	Belgrade/Cardinal, Model 748

Production

Maximum Hourly Production Rate:	110	cy/hr
Proposed Daily Production Rate:	1000	cy/day
Proposed Maximum Annual Production Rate:	64900	cy/year

Tons/year

Emissions Units		$PM_{2.5}$	PM_{10}	SO_2	NO_x	CO	VOC	Lead	THAPs	CO_2e
CBP Type:	Truck Mix	0.003	0.01	NA	NA	NA	NA	1.04E-05		N/A
Water Heater #1:	3 MMBtu/hr Natural Gas Heater	0.034	0.034	2.65E-03	0.441	0.371	0.024	2.21E-06		533
Water Heater #2:	No water heater	0.000	0.000	0.00E+00	0.000	0.000	0.000	0.00E+00		0
Small Diesel Engine(s) *:	No Engine	0.00	0.00	0.00E+00	0.00	0.00	0.00	NA		0
Large Diesel Engine *:	No Large Engine	0.00	0.00	0.00E+00	0.00	0.00	0.00	NA		0
	Transfer/Drop Points	0.038	0.12	NA	NA	NA	NA	NA		N/A
	Annual Totals (T/yr)	**0.07**	**0.17**	**2.65E-03**	**0.44**	**0.37**	**0.02**	**1.26E-05**	**6.67E-03**	**533**

Pounds/hour

		$PM_{2.5}$	PM_{10}	SO_2	NO_x	CO	VOC	Lead	THAPs
CBP Type:	Truck Mix	0.496	0.83	NA	NA	NA	NA	3.05E-05	
Water Heater #1:	3 MMBtu/hr Natural Gas Heater	0.022	0.022	1.76E-03	0.294	0.247	0.016	1.47E-06	
Water Heater #2:	No water heater	0.000	0.000	0.00E+00	0.000	0.000	0.000	0.00E+00	
Small Diesel Engine(s) *:	No Engine	0.00	0.00	0.00E+00	0.00	0.00	0.00	NA	
Large Diesel Engine*:	No Large Engine	0.00	0.00	0.00E+00	0.00	0.00	0.00	NA	
	Transfer/Drop Points	0.049	0.16	NA	NA	NA	NA	NA	
	Daily Totals (lb/hr)	**0.57**	**1.01**	**1.76E-03**	**0.29**	**0.25**	**0.02**	**3.19E-05**	**4.69E-03**

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

HAPS & TAPS Emissions Inventory

Metals	HAP	TAP	lb/hr	T/yr	Averaging Period	EL lb/hr	Exceeded?
Arsenic	X	X	6.85E-06	2.92E-05	Annual	1.50E-06	Yes
Barium		X	9.71E-06	1.46E-05	24-hour	3.30E-02	No
Beryllium	X	X	1.65E-07	6.73E-07	Annual	2.80E-05	No
Cadmium	X	X	1.55E-06	2.32E-06	Annual	3.70E-06	No
Cobalt	X	X	1.85E-07	2.78E-07	24-hour	3.30E-03	No
Copper		X	1.88E-06	2.81E-06	24-hour	1.30E-02	No
Chromium	X	X	4.94E-05	3.24E-05	24-hour	3.30E-02	No
Manganese	X	X	1.84E-04	1.43E-04	24-hour	3.33E-01	No
Mercury	X	X	5.74E-07	8.60E-07	24-hour	N/A	No
Molybdenum (soluble)		X	2.43E-06	3.64E-06	24-hour	3.33E-01	No
Nickel	X	X	9.02E-06	3.10E-05	Annual	2.70E-05	No
Phosphorus	X	X	1.49E-04	9.20E-05	24-hour	7.00E-03	No
Selenium	X	X	7.86E-06	6.16E-06	24-hour	1.30E-02	No
Vanadium		X	5.07E-06	7.61E-06	24-hour	3.00E-03	No
Zinc		X	6.40E-05	9.60E-05	24-hour	6.67E-01	No
Chromium VI	X	X	1.38E-06	6.03E-06	Annual	5.60E-07	Yes
Non PAH Organic Compunds							
Pentane		X	3.53E-03	5.29E-03	24-hour	118	No
Methyl Ethyl Ketone		X	0.00E+00	0.00E+00	24-hour	39.3	No
Non-PAH HAPs							
Acetaldehyde	X	X	0.00E+00	0.00E+00	Annual	3.00E-03	No
Acrolein	X	X	0.00E+00	0.00E+00	24-hour	1.70E-02	No
Benzene	X	X	2.12E-06	7.24E-07	Annual	8.00E-04	No
1,3 - Butadiene	X	X	0.00E+00	0.00E+00	Annual	2.40E-05	No
Ethyl Benzene	X	X	0.00E+00	0.00E+00	24-hour	29	No
Formaldehyde	X	X	7.55E-05	2.59E-05	Annual	5.10E-04	No
Hexane	X	X	3.97E-03	5.96E-03	24-hour	12	No
Isooctane	X		0.00E+00	0.00E+00	N/A	N/A	N/A
Methyl Chloroform	X	X	0.00E+00	0.00E+00	24-hour	127	No
Propionaldehyde	X	X	0.00E+00	0.00E+00	24-hour	2.87E-02	No
Quinone	X	X	0.00E+00	0.00E+00	24-hour	2.70E-02	No
Toluene	X	X	7.50E-06	1.13E-05	24-hour	25	No
o-Xylene	X	X	0.00E+00	0.00E+00	24-hour	29	No
PAH HAPs							
2-Methylnaphthalene	X	X	2.42E-08	8.28E-09	Annual	9.10E-05	No
3-Methylcholanthrene	X	X	1.81E-09	6.21E-10	Annual	2.50E-06	No
7,12-Dimethylbenz(a)anthracene	X		3.53E-08	5.29E-08	N/A	N/A	N/A
Acenaphthene	X	X	1.81E-09	6.21E-10	Annual	9.10E-05	No
Acenaphthylene	X	X	1.81E-09	6.21E-10	Annual	9.10E-05	No
Anthracene	X	X	2.42E-09	8.28E-10	Annual	9.10E-05	No
Benzo(a)anthracene	X	X	1.81E-09	6.21E-10	Annual	9.10E-05	No
Benzo(a)pyrene	X	X	1.21E-09	4.14E-10	Annual	2.00E-06	No
Benzo(b)fluoranthene	X	X	1.81E-09	6.21E-10	Annual	2.00E-06	No
Benzo(e)pyrene	X	X	0.00E+00	0.00E+00	Annual	2.00E-06	No
Benzo(g,h,i)perylene	X	X	1.21E-09	4.14E-10	Annual	9.10E-05	No
Benzo(k)fluoranthene	X	X	1.81E-09	6.21E-10	Annual	2.00E-06	No
Chrysene	X	X	1.81E-09	6.21E-10	Annual	2.00E-06	No
Dibenzo(a,h)anthracene	X	X	1.21E-09	4.14E-10	Annual	2.00E-06	No
Dichlorobenzene	X	X	1.21E-06	4.14E-07	Annual	9.10E-05	No
Fluoranthene	X	X	3.02E-09	1.03E-09	Annual	9.10E-05	No
Fluorene	X	X	2.82E-09	9.66E-10	Annual	9.10E-05	No
Indeno(1,2,3-cd)pyrene	X	X	1.81E-09	6.21E-10	Annual	2.00E-06	No
Naphthalene (24-hour)	X	X	2.24E-04	3.36E-04	24-hour	3.33	No
Naphthalene (Annual)	X	X	6.14E-07	2.10E-07	Annual	9.10E-05	No
Perylene	X		0.00E+00	0.00E+00	N/A	N/A	N/A
Phenanathrene	X	X	1.71E-08	5.86E-09	Annual	9.10E-05	No
Pyrene	X	X	5.04E-09	1.72E-09	Annual	9.10E-05	No
PAH HAPs Total	X	X	1.15E-08		Annual	2.00E-06	No
Polycyclic Organic Matter (POM)	X	X	1.15E-08	3.93E-09	Annual	2.00E-06	No

Total HAPs Emissions (lb/hr) and (T/yr): 4.69E-03 6.67E-03

APPENDIX B – AMBIENT AIR QUALITY IMPACT ANALYSES

MEMORANDUM

DATE: December 20, 2016

TO: Morrie Lewis, Permit Writer, Air Program

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

PROJECT: P-2015.0021 PROJ 61621, PTC for Existing Concrete Batch Plant Facility in Paul, ID

SUBJECT: Demonstration of Compliance with IDAPA 58.01.01.203.02 (NAAQS) and 203.03 (TAPs) as it relates to air quality impact analyses.

Contents

Acronyms, Units, and Chemical Nomenclature

AAC	Acceptable Ambient Concentration of a non-carcinogenic TAP
AACC	Acceptable Ambient Concentration of a Carcinogenic TAP
acfm	Actual cubic feet per minute
AERMAP	The terrain data preprocessor for AERMOD
AERMET	The meteorological data preprocessor for AERMOD
AERMOD	American Meteorological Society/Environmental Protection Agency Regulatory Model
Appendix W	40 CFR 51, Appendix W – Guideline on Air Quality Models
As	Arsenic
BPIP	Building Profile Input Program
BRC	Below Regulatory Concern
CBP	Concrete Batch Plant
CFR	Code of Federal Regulations
CMAQ	Community Multi-Scale Air Quality Modeling System
CO	Carbon Monoxide
Cr^{6+}	Hexavalent Chromium
DEM	Digital Elevation Map
DEQ	Idaho Department of Environmental Quality
EL	Emissions Screening Level of a TAP
EPA	United States Environmental Protection Agency
GEP	Good Engineering Practice
hr	hours
Idaho Air Rules	Rules for the Control of Air Pollution in Idaho, located in the Idaho Administrative Procedures Act 58.01.01
ISCST3	Industrial Source Complex Short Term 3 dispersion model
K	Kelvin
m	Meters
m/sec	Meters per second
MMBtu	Million British Thermal Units
NAAQS	National Ambient Air Quality Standards
NO	Nitrogen Oxide
NO_2	Nitrogen Dioxide
NOx	Oxides of Nitrogen
NWS	National Weather Service
O_3	Ozone
Pb	Lead
PM_{10}	Particulate matter with an aerodynamic particle diameter less than or equal to a nominal 10 micrometers
$PM_{2.5}$	Particulate matter with an aerodynamic particle diameter less than or equal to a nominal 2.5 micrometers
ppb	parts per million
PRIME	Plume Rise Model Enhancement
PTC	Permit to Construct
PTE	Potential to Emit

SIL	Significant Impact Level
SO_2	Sulfur Dioxide
TAP	Toxic Air Pollutant
tpy	tons per year
USGS	United States Geological Survey
UTM	Universal Transverse Mercator
VOC	Volatile Organic Compounds
$\mu g/m^3$	Micrograms per cubic meter of air

1.0 Summary

Kloepfer, Inc. (Kloepfer) submitted a Permit to Construct (PTC) application for their existing concrete batch plant (CBP), named Paul Ready-Mix Batch Plant (Paul Ready-Mix), located in Paul, Idaho. The PTC application was received on November 2, 2015, and determined complete by DEQ on December 2, 2015. The Idaho Administrative Procedures Act 58.01.01.203.02 and 203.03 (Idaho Air Rules Section 203.02 and 203.03) require that no permit shall be granted unless it is demonstrated that the new source or modification will not cause or contribute to a violation of an applicable air quality standard.

This memorandum provides a summary of the regulatory applicability and air impact analyses performed to satisfy the requirements of Idaho Air Rules Section 203.02 and 203.03. Idaho Air Rules Section 203.02, requiring a demonstration of compliance with National Ambient Air Quality Standards (NAAQS), was not applicable to this permitting action because estimated maximum emissions of criteria pollutants were at levels qualifying the source for a below regulatory concern (BRC) permit exemption as per Idaho Air Rules Section 221. The permitting action was subject to Idaho Air Rules Section 203.03, requiring a demonstration of compliance with Toxic Air Pollutant (TAP) increment standards.

Project-specific air quality impact analyses involving atmospheric dispersion modeling of estimated TAP emissions associated with the facility were performed by DEQ to demonstrate that the facility would not cause a violation of any identified TAP Acceptable Ambient Concentration (AAC) or Acceptable Ambient Concentration of a Carcinogen (AACC).

The DEQ review of submitted data/analyses and DEQ performance of air impact analyses summarized by this memorandum addressed only the rules, policies, methods, and data pertaining to the air impact analyses used to demonstrate that estimated emissions associated with operation of the facility will not cause or significantly contribute to a violation of any applicable air quality standard. This review did not address/evaluate compliance with other rules or analyses not pertaining to the air impact analyses. Evaluation of emissions estimates was the responsibility of the permit writer and is addressed in the main body of the DEQ Statement of Basis, and emissions calculation methods were not evaluated in this modeling review memorandum.

The submitted information and analyses, in combination with DEQ's analyses: 1) utilized appropriate methods and models; 2) was conducted using reasonably accurate or conservative model parameters and input data (review of emissions estimates was addressed by the DEQ permit writer); 3) adhered to established DEQ guidelines for new source review dispersion modeling; 4) showed either a) that estimated potential/allowable emissions are at a level defined as below regulatory concern (BRC) and do not require a NAAQS compliance demonstration; b) that predicted pollutant concentrations from emissions associated with the project as modeled were below Significant Impact Levels (SILs) or other applicable regulatory thresholds; or c) that predicted pollutant concentrations from emissions associated with the project as modeled, when appropriately combined with co-contributing sources and background concentrations, were below applicable NAAQS at ambient air locations where and when the project has a significant impact; 5) showed that TAP emissions increases associated with the project will not result in increased ambient air impacts exceeding allowable TAP increments.

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

Idaho Air Rules require air impact analyses be conducted per methods and guidelines outlined in 40 CFR 51, Appendix W *Guideline on Air Quality Models* (Appendix W). Appendix W requires that air quality impacts be assessed by atmospheric dispersion models using emissions and operations representative of design capacity or as limited by a federally enforceable permit condition. The submitted information and

analyses, in combination with DEQ's analyses, demonstrated to the satisfaction of the Department that operation of the proposed facility 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. The DEQ permit writer should use Table 1 and other information presented in this memorandum to generate appropriate permit provisions/restrictions to assure the requirements of Appendix W are met regarding emissions representing design capacity or permit allowable rates.

Table 1. KEY ASSUMPTIONS USED IN MODELING ANALYSES

Criteria/Assumption/Result	Explanation/Consideration
Allowable Throughput. An annual throughput restriction of 64,900 cubic yards of concrete was used to demonstrate compliance with TAP increment standards.	An annual throughput restriction is also needed to ensure that annual non-fugitive emissions of criteria pollutants remain below BRC levels.
General Emissions Rates. Emissions rates used in the dispersion modeling analyses, as listed in this memorandum, must represent maximum potential emissions as given by design capacity or as limited by the issued permit for the specific pollutant and averaging period.	Compliance has not been demonstrated for emissions rates greater than those used in the modeling analyses.
Below Regulatory Concern for Criteria Pollutant Emissions. Maximum non-fugitive annual emissions of PM_{10}[a], $PM_{2.5}$[b], oxides of nitrogen (NOx), carbon monoxide (CO), sulfur dioxide (SO_2), and lead (Pb) are below levels identified as below regulatory concern (BRC) as per Idaho Air Rules Section 221, and the project would be exempt from permitting if it were not for emissions of TAPs exceeding regulatory exemption criteria.	Idaho Air Rules Section 203.02, requiring air impact analyses demonstrating compliance with NAAQS, is not applicable to pollutants having a project-emissions increase that is less than BRC levels, provided the project would have qualified for a BRC permitting exemption except for the emissions levels of another criteria pollutant exceeding the ton/year BRC threshold.

[a] Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers.
[b] Particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers.

2.0 Background Information

This section provides background information applicable to the project and the site where the facility is located. It also provides a brief description of the applicable air impact analyses requirements for the project.

2.1 Project Description

The Paul Ready-Mix facility is an existing stationary concrete batch plant (CBP). Pollutant-emitting processes performed at the facility will include material handling of cement, aggregate, and fly ash. A 3.0 million British thermal unit per hour (MMBtu/hr) natural gas-fired water heater will also operate at the facility. The PTC addresses all air pollutant emitting activities at the site.

2.2 Proposed Location and Area Classification

The facility is located Paul, Idaho, within Minidoka county. This area is designated as an attainment or unclassifiable area for sulfur dioxide (SO_2), nitrogen dioxide (NO_2), carbon monoxide (CO), lead (Pb), ozone (O_3), particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers (PM_{10}), and particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers ($PM_{2.5}$). The area is not classified as non-attainment for any criteria pollutants.

2.3 Air Impact Analyses Required for All Permits to Construct

Idaho Air Rules Sections 203.02 and 203.03:

> *No permit to construct shall be granted for a new or modified stationary source unless the applicant shows to the satisfaction of the Department all of the following:*
>
> ***02. NAAQS.*** *The stationary source or modification would not cause or significantly contribute to a violation of any ambient air quality standard.*
>
> ***03. Toxic Air Pollutants.*** *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.*

Atmospheric dispersion modeling, using computerized simulations, is used to demonstrate compliance with both NAAQS and TAPs. Idaho Air Rules Section 202.02 states:

> ***02. Estimates of Ambient Concentrations.*** *All estimates of ambient concentrations shall be based on the applicable air quality models, data bases, and other requirements specified in 40 CFR 51 Appendix W (Guideline on Air Quality Models).*

2.4 Significant Impact Level and Cumulative NAAQS Impact Analyses

The Significant Impact Level (SIL) analysis for a new facility or proposed modification to a facility involves modeling estimated criteria air pollutant emissions from the facility or modification to determine the potential impacts to ambient air. Air impact analyses are required by Idaho Air Rules to be conducted per 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.

A facility or modification is considered to have a significant impact on air quality if maximum modeled impacts to ambient air exceed the established SIL listed in Idaho Air Rules Section 006 (referred to as a "significant contribution" in Idaho Air Rules) or as incorporated by reference as per Idaho Air Rules Section 107.03.b. Table 2 lists the applicable SILs.

If modeled maximum pollutant impacts to ambient air from the emissions sources associated with a new facility or modification exceed the SILs, 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 assessing ambient impacts (typically the design values consistent with the form of the standard) from facility-wide emissions, and emissions from any nearby co-contributing sources, and then adding a DEQ-approved background concentration value to the modeled result that is appropriate for the criteria pollutant/averaging-period at the facility location and the area of significant impact. The resulting pollutant concentrations in ambient air are then compared to the NAAQS listed in Table 2. Table 2 also lists SILs and specifies the modeled design value that must be used for comparison to the NAAQS. NAAQS compliance is evaluated on a receptor-by-receptor basis for the modeling domain.

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 Design Value Used[d]**
PM_{10}[e]	24-hour	5.0	150[f]	Maximum 6th highest[g]
$PM_{2.5}$[h]	24-hour	1.2	35[i]	Mean of maximum 8th highest[j]
	Annual	0.3	12[k]	Mean of maximum 1st highest[l]
Carbon monoxide (CO)	1-hour	2,000	40,000[m]	Maximum 2nd highest[n]
	8-hour	500	10,000[m]	Maximum 2nd highest[n]
Sulfur Dioxide (SO_2)	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]
	3-hour	25	1,300[m]	Maximum 2nd highest[n]
	24-hour	5	365[m]	Maximum 2nd highest[n]
	Annual	1.0	80[r]	Maximum 1st highest[n]
Nitrogen Dioxide (NO_2)	1-hour	4 ppb (7.5 $\mu g/m^3$)	100 ppb[s] (188 $\mu g/m^3$)	Mean of maximum 8th highest[t]
	Annual	1.0	100[r]	Maximum 1st highest[n]
Lead (Pb)	3-month[u]	NA	0.15[r]	Maximum 1st highest[n]
	Quarterly	NA	1.5[r]	Maximum 1st highest[n]
Ozone (O_3)	8-hour	40 TPY VOC[v]	75 ppb[w]	Not typically modeled

a. Idaho Air Rules Section 006 (definition for significant contribution) or as incorporated by reference as per Idaho Air Rules Section 107.03.b.
b. Micrograms per cubic meter.
c. Incorporated into Idaho Air Rules by reference, as per Idaho Air Rules Section 107.
d. The maximum of 1st highest modeled values is always used for the significant impact analysis unless indicated otherwise. Modeled design values are calculated for each ambient air receptor.
e. Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers.
f. Not to be exceeded more than once per year on average over 3 years.
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 mean of the upper 98th percentile of the annual distribution of 24-hour concentrations.
j. 5-year mean of the 8th highest modeled 24-hour concentrations at the modeled receptor for each year of meteorological data modeled. For the SIL analysis, the 5-year mean of the 1st highest modeled 24-hour impacts at the modeled receptor for each year.
k. 3-year mean of annual concentration.
l. 5-year mean of annual averages at the modeled receptor.
m. Not to be exceeded more than once per year.
n. Concentration at any modeled receptor.
o. Interim SIL established by EPA policy memorandum.
p. 3-year mean of the upper 99th percentile of the annual distribution of maximum daily 1-hour concentrations.
q. 5-year mean of the 4th highest daily 1-hour maximum modeled concentrations for each year of meteorological data modeled. For the significant impact analysis, the 5-year mean of 1st highest modeled 1-hour impacts for each year is used.
r. Not to be exceeded in any calendar year.
s. 3-year mean of the upper 98th percentile of the annual distribution of maximum daily 1-hour concentrations.
t. 5-year mean of the 8th highest daily 1-hour maximum modeled concentrations for each year of meteorological data modeled. For the significant impact analysis, the 5-year mean of maximum modeled 1-hour impacts for each year is used.
u. 3-month rolling average.
v. An annual emissions rate of 40 ton/year of VOCs is considered significant for O_3.
w. Annual 4th highest daily maximum 8-hour concentration averaged over three years. The O_3 standard was revised (the notice was signed by the EPA Administrator on October 1, 2015) to 70 ppb. However, this standard will not be applicable for permitting purposes until it is incorporated by reference *sine die* into Idaho Air Rules.

If the cumulative NAAQS impact analysis indicates a violation of the standard, the permit may not be issued if the proposed project has a significant contribution (exceeding the SIL) to the modeled violation. If project-specific impacts are below the SIL at the specific receptors showing the violations during the time periods when modeled violations occurred, then the project does not have a significant contribution to the specific violations.

Compliance with Idaho Air Rules Section 203.02 is generally demonstrated if: a) applicable specific criteria pollutant emissions increases are at a level defined as BRC, using the criteria established by DEQ regulatory interpretation[1]; or b) all modeled impacts of the SIL analysis are below the applicable SIL or other level determined to be inconsequential to NAAQS compliance; or c) modeled design values of the cumulative NAAQS impact analysis (modeling all emissions from the facility and co-contributing sources, and adding a background concentration) are less than applicable NAAQS at receptors where impacts from the proposed facility/modification exceeded the SIL or other identified level of consequence; or d) if the cumulative NAAQS analysis showed NAAQS violations, the impact of proposed facility/modification to any modeled violation was inconsequential (typically assumed to be less than the established SIL) for that specific receptor and for the specific modeled time when the violation occurred.

2.5 *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.*

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

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

Per Section 210, if the 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.

Idaho Air Rules Section 210.20 states that if TAP emissions from a specific source are regulated by the Department or EPA under 40 CFR 60, 61, or 63, then a TAP impact analysis under Section 210 is not required for that TAP. The DEQ permit writer evaluates the applicability of specific TAPs to the Section 210.20 exclusion.

3.0 Analytical Methods and Data

This section describes the methods and data used in analyses to demonstrate compliance with applicable air quality impact requirements.

3.1 Emission Source Data

Emissions of criteria pollutants and TAPs resulting from operation of the Paul Ready-Mix CBP were calculated by DEQ for various applicable averaging periods. The calculation of potential emissions is the responsibility of the DEQ permit writer, and the representativeness and accuracy of emissions estimates is not addressed in this modeling memorandum. DEQ air impact analyses review included verification that the potential emissions rates provided in the emissions inventory were properly used in the model. The rates listed must represent the maximum allowable rate as averaged over the specified period.

Emissions rates used in the dispersion modeling analyses, as listed in this memorandum, should be reviewed by the DEQ permit writer and compared with those in the final emissions inventory. All modeled criteria air pollutant and TAP emissions rates must be equal to or greater than the facility's potential emissions calculated in the PTC emissions inventory or proposed permit allowable emissions rates.

3.1.1 *Modeling Applicability and Modeled Criteria Pollutant Emissions Rates*

Facility-wide potential to emit (PTE) values for all criteria pollutants would qualify for a below regulatory concern (BRC) permit exemption as per Idaho Air Rules Section 221 (equal to 10 percent of the emissions defined as significant) if it were not for potential emissions of TAPs exceeding the BRC threshold of 10 percent of emissions screening levels (ELs). DEQ's regulatory interpretation policy of exemption provisions of Idaho Air Rules is that: "A DEQ NAAQS compliance assertion will not be made by the DEQ modeling group for specific criteria pollutants having a project emissions increase below BRC levels, provided the proposed project would have qualified for a Category I Exemption for BRC emissions quantities except for the emissions of another criteria pollutant.[1]" The interpretation policy also states that the exemption criteria of uncontrolled PTE not to exceed 100 ton/year (Idaho Air Rules Section 220.01.a.i) is not applicable when evaluating whether a NAAQS impact analyses is required. A permit will be issued limiting PTE below 100 ton/year, thereby negating the need to maintain calculated uncontrolled PTE under 100 ton/year. A permit is needed for the proposed Paul Ready-Mix CBP only because TAP emissions exceed BRC levels.

The DEQ emissions inventory asserts that facility-wide controlled PTE emissions of specific criteria pollutants are below BRC levels, as listed in Table 3.

Table 3. CRITERIA POLLUTANT NAAQS COMPLIANCE DEMONSTRATION APPLICABILITY

Criteria Pollutant	BRC Level (ton/year)	Applicable Facility Wide PTE Emissions (ton/year)	Air Impact Analyses Required?
PM_{10}[a]	1.5	0.04	No
$PM_{2.5}$[b]	1.0	0.04	No
Carbon Monoxide (CO)	10.0	0.4	No
Sulfur Dioxide (SO_2)	4.0	0.003	No
Nitrogen Oxides (NOx)	4.0	0.4	No
Lead (Pb)	0.06	0.000002	No

a. Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers.
b. Particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers.

Ozone (O_3) differs from other criteria pollutants in that it is not typically emitted directly into the atmosphere. O_3 is formed in the atmosphere through reactions of VOCs, NOx, and sunlight. Atmospheric dispersion models used in stationary source air permitting analyses (see Section 3.3.3) cannot be used to estimate O_3 impacts resulting from VOC and NOx emissions from an industrial facility. O_3 concentrations resulting from area-wide emissions are predicted by using more complex airshed models such as the Community Multi-Scale Air Quality (CMAQ) modeling system. Use of the CMAQ model is very resource intensive and DEQ asserts that performing a CMAQ analysis for a particular permit application is not typically a reasonable or necessary requirement for air quality permitting.

Addressing secondary formation of O_3 has been somewhat addressed in EPA regulation and policy. As stated in a letter from Gina McCarthy of EPA to Robert Ukeiley, acting on behalf of the Sierra Club (letter from Gina McCarthy, Assistant Administrator, United States Environmental Protection Agency, to Robert Ukeiley, January 4, 2012):

> *. . . footnote 1 to sections 51.166(I)(5)(I) of the EPA's regulations says the following: "No de minimis air quality level is provided for ozone. However, any net emission increase of 100 tons per year or more of volatile organic compounds or nitrogen oxides subject to PSD would be required to perform an ambient impact analysis, including the gathering of air quality data."*
>
> *The EPA believes it unlikely a source emitting below these levels would contribute to such a violation of the 8-hour ozone NAAQS, but consultation with an EPA Regional Office should still be conducted in accordance with section 5.2.1.c. of Appendix W when reviewing an application for sources with emissions of these ozone precursors below 100 TPY."*

DEQ determined it was not appropriate or necessary to require a quantitative source specific O_3 impact analysis because allowable emissions estimates of VOCs and NOx are below the 100 tons/year threshold.

Secondary Particulate Formation

The impact from secondary particulate formation resulting from emissions of NOx, SO_2, and/or VOCs was assumed by DEQ to be negligible based on the magnitude of emissions and the short distance from emissions sources to modeled receptors where maximum PM_{10} and $PM_{2.5}$ impacts were predicted.

3.1.2 Toxic Air Pollutant Emissions Rates

TAP emissions regulations under Idaho Air Rules Section 210 are only applicable for new or modified sources constructed after July 1, 1995. TAP compliance for the Paul Ready-Mix CBP was demonstrated on a facility-wide basis.

Facility-wide emissions of arsenic (As) and chromium 6+ (Cr^{6+}) exceed the applicable emissions screening levels (ELs) of Idaho Air Rules Section 586. Air impact modeling analyses were then required to demonstrate that maximum impacts of As and Cr^{6+} are below applicable ambient increment standards expressed in Idaho Air Rules Section 585 and 586 as AACs and AACCs.

Table 4 lists the TAP modeled emissions rates for As and Cr^{6+}.

Table 4. EMISSIONS RATES MODELED FOR TAP IMPACT ANALYSES			
Source ID	Description	Emission Rates (lb/hr[a])	
		Arsenic Annual	Chromium 6+ Annual
SILO	Cement storage silo filling	7.71E-9	1.05E-8
SUPSILO	Cement supplement (fly ash) storage silo filling	2.70E-7	9.90E-8
UNCONTRKLOAD	Truck loadout	6.37E-6	1.27E-6
HEATER	3 MMBtu/hr natural gas boiler	None listed	None listed

[a] Pounds per hour for listed averaging period.

Emissions of As and Cr^{6+} occur from the handling of both dry cement and fly ash. Emissions from the filling of storage silos are controlled by a filtration system and emissions from truck loadout are controlled by the combination of a shroud and a water spray.

As and Cr^{6+} are carcinogenic TAPs that are regulated on a long-term basis. Therefore, the appropriate emission rates for impact analyses are maximum annual emissions, expressed as an average pound/hour value over an 8,760-hour period.

3.1.3 Emissions Release Parameters

Table 5 lists emissions release parameters, including stack height, stack diameter, exhaust temperature, and exhaust velocity for emissions sources modeled in the air impact analyses. The Paul Ready-Mix CBP is already constructed at the site, so DEQ determined emissions point locations from recent aerial imagery on the Google earth web-based GIS program.

Table 5. POINT SOURCE STACK PARAMETERS USED IN MODELING							
Point Source Parameters							
Release Point	Description	UTM[a] Coordinates		Stack Height (m)	Stack Gas Flow Temp. (K)[c]	Stack Flow Velocity (m/sec)[d]	Stack Dia. (m)
		Easting (m)[b]	Northing (m)				
SILO	Cement storage silo filling	272222	4720643	3.35	0[e]	0.22	1.22
SUPSILO	Cement supplement (fly ash) storage silo filling	272222	4720643	2.44	0[e]	0.22	1.22
Volume Source Parameters							
Release Point	Description	UTM Coordinates		Release Height (m)	Int. Horz. Dimension σ_{yo}[f] (m)		Int. Vert. Dimension σ_{zo}[g] (m)
		Easting	Easting				
UNCONTRKLOAD	Truck loadout	272231	4720634	3.75	2.33		3.49

[a] Universal Transverse Mercator.
[b] Meters.
[c] Kelvin.
[d] Meters per second.
[e] Set to 0 to direct model to use a release temperature equal to the ambient air temperature specified in the meteorological data input file.
[f] Initial horizontal dimension of plume.
[g] Initial vertical dimension of plume.

The submitted application provided stack heights for the storage silo vents. The location of the silo vents was not known, and DEQ performed modeling by conservatively assuming both silos vented at the same location adjacent to the truck loadout source.

Emissions from truck loadout of dry concrete, fly ash, and aggregate were modeled as a volume source. The release height was set at 3.75 meters, the typical height of cement truck feed chutes. The initial horizontal dimension (σ_{yo}) was set at a value equal to the length of the source's side divided by 4.3, as directed by EPA guidance for AERMOD[2]. The length of side was set to 10 meters to represent the structure of the plant and any adjacent building, and σ_{yo} was calculated at 2.33 meters. The initial vertical dimension (σ_{zo}) was set at a value equal to the vertical extent of the source or the height of an adjacent building divided by 2.15, as directed by EPA guidance for AERMOD. The vertical extent was set at two times the release height or 7.5 meters, giving a σ_{zo} of 3.49 meters.

3.2 Background Concentrations

Background concentrations are used if a cumulative NAAQS impact analysis is needed to demonstrate compliance with applicable NAAQS. Cumulative NAAQS analyses were not required for this project because emissions of all criteria pollutants were below levels defined as BRC, and as such, a NAAQS compliance demonstration was not required for these emissions.

3.3 Impact Modeling Methodology

This section describes the modeling methods used by the applicant and/or DEQ to demonstrate preconstruction compliance with applicable air quality standards.

3.3.1 General Overview of Impact Analyses

DEQ performed the project-specific air pollutant emissions inventory and air impact analyses based on information submitted from the Paul Ready-Mix facility. The submitted information/analyses, in combination with results from DEQ's air impact analyses, demonstrate compliance with applicable air quality standards to DEQ's satisfaction, provided the facility is operated as described in the submitted application and in this memorandum.

Table 6 provides a brief description of parameters used in the modeling analyses.

Table 6. MODELING PARAMETERS

Parameter	Description/Values	Documentation/Addition Description
General Facility Location	Paul, Idaho	The area is an attainment or unclassified area for all criteria pollutants.
Model	AERMOD	AERMOD with the PRIME downwash algorithm, version 15181.
Meteorological Data	INL/Minidoka surface data, Boise upper air data	See Section 3.3.4 of this memorandum for additional details of the meteorological data.
Terrain	Not Considered	Immediate area is effectively flat for dispersion effect consideration.
Building Downwash	Considered	Plume downwash was considered for the structures associated with the facility. BPIP-PRIME was used to evaluate building dimensions for consideration of downwash effects in AERMOD.
Receptor Grid	Grid 1	DEQ: 10-meter spacing along the property boundary out to 100 meters
	Grid 2	DEQ: 25-meter spacing out to 125 meters.

3.3.2 Modeling Methodology

Final project-specific modeling and other required impact analyses were generally conducted using data and methods described in the *Idaho Air Quality Modeling Guideline*[3].

3.3.3 Model Selection

Idaho Air Rules Section 202.02 requires that estimates of ambient concentrations be based on air quality models specified in 40 CFR 51, Appendix W (Guideline on Air Quality Models). The refined, steady state, multiple source, Gaussian dispersion model AERMOD was promulgated as the replacement model for ISCST3 in December 2005. AERMOD retains the single straight line trajectory of ISCST3, but includes more advanced algorithms to assess turbulent mixing processes in the planetary boundary layer for both convective and stable stratified layers.

AERMOD version 15181 was used by DEQ for the modeling analyses to evaluate impacts of the facility. This version was the current version at the time the application was received by DEQ.

3.3.4 Meteorological Data

DEQ used meteorological data collected at an INL monitoring location in Minidoka/Burley # 25867 for the period 2000-2004. Upper air data was taken from the Boise, Idaho airport. DEQ determined these data were reasonably representative for the Paul Ready-Mix site in Paul, Idaho.

3.3.5 Effects of Terrain on Modeled Impacts

DEQ determined the area surrounding the Paul Ready-Mix CBP is relatively flat for plume dispersion considerations. The impact modeling was performed using the non-default FLAT terrain option.

3.3.6 Facility Layout

The Paul Ready-Mix property boundary was provided to DEQ by the applicant through an aerial photograph. DEQ used the submitted plot plan and aerial photographs on Google Earth, which uses the WGS84 datum, to establish model inputs of buildings, sources, and the property boundary.

3.3.7 Effects of Building Downwash on Modeled Impacts

Potential downwash effects on emissions plumes were accounted for in the model by using building dimensions and locations (locations of building corners, base elevation, and building heights). Dimensions and orientation of buildings were used as input to the Building Profile Input Program for the Plume Rise Model Enhancements downwash algorithm (BPIP-PRIME) to calculate direction-specific dimensions and Good Engineering Practice (GEP) stack height information for input to AERMOD. The primary source driving impacts in the analyses was the truck loadout, which was modeled as a volume source. Since downwash is not explicitly handled in AERMOD for volume sources, the accuracy of building parameters was not critical for model accuracy.

3.3.8 Ambient Air Boundary

Ambient air is defined in Section 006 of the Idaho Air Rules as "that portion of the atmosphere, external to buildings, to which the general public has access." Ambient air was considered areas external to the identified Paul Ready-Mix property boundary. The small size of the site facilitates restricting public access to the property, and it was assumed the facility will take reasonable measures to preclude public access.

3.3.9 Receptor Network

Table 6 describes the receptor grid used in the submitted analyses. The receptor grid used in DEQ's analyses met the minimum recommendations specified in the *Idaho Air Quality Modeling Guideline*[3] and DEQ determined that it was adequate to resolve maximum modeled impacts. A receptor grid extending out beyond 200 meters from the emissions sources was not necessary for these analyses because pollutants are emitted from relatively short stacks that will cause maximum impacts very close to the source, typically at or near the ambient air boundary. Also, the surrounding area is relatively free from complex terrain (terrain above stack height) that could cause a high ground level impact at a more distant location.

3.3.10 Good Engineering Practice Stack Height

An allowable good engineering practice (GEP) stack height may be established using the following equation in accordance with Idaho Air Rules Section 512.03.b:

$H = S + 1.5L$, where:

H = good engineering practice stack height measured from the ground-level elevation at the base of the stack.

S = height of the nearby structure(s) measured from the ground-level elevation at the base of the stack.

L = lesser dimension, height or projected width, of the nearby structure.

All Paul Ready-Mix CBP sources are below GEP stack height. Therefore, it is important to account for plume downwash caused by structures at the facility.

4.0 NAAQS and TAPs Impact Modeling Results

4.1 Results for NAAQS Analyses

A NAAQS impact analysis was not performed for the Paul Ready-Mix CBP facility.

Idaho Air Rules Section 203.02, requiring air impact analyses demonstrating compliance with NAAQS, is not applicable to pollutants having a project-emissions increase that is less than BRC levels, provided the project would have qualified for a BRC permitting exemption except for the emissions levels of another criteria pollutant exceeding the ton/year BRC threshold.

4.2 Results for TAPs Impact Analyses

Dispersion modeling was required to demonstrate compliance with TAP increments specified by Idaho Air Rules Section 585 and 586 for those TAPs with facility-wide emissions exceeding emissions screening levels (ELs). The results of the TAPs analyses are listed in Table 7. The predicted ambient TAPs impacts were below any TAPs increments for an allowable throughput of 64,900 cubic yards/year of concrete produced.

Table 7. RESULTS OF TAPs ANALYSES				
Toxic Air Pollutant	**Averaging Period**	**Maximum Modeled Concentration ($\mu g/m^3$)[a]**	**AAC/AACC[b] ($\mu g/m^3$)**	**Percent of AAC/AACC**
Carcinogenic TAPs				
Arsenic	Annual	2.30E-4	2.3E-4	99.98
Chromium 6+	Annual	4.8E-5	8.3E-5	58

a. Micrograms per cubic meter

b Acceptable ambient concentration for non-carcinogens/acceptable ambient concentration for carcinogens

5.0 Conclusions

The information submitted with the PTC application, combined with DEQ air impact analyses, demonstrated to DEQ's satisfaction that emissions from the Paul Ready-Mix CBP facility will not cause or significantly contribute to a violation of any ambient air quality standard.

References

1. *Policy on NAAQS Compliance Demonstration Requirements.* Idaho Department of Environmental Quality Policy Memorandum. July 11, 2014.

2. *User's Guide for the AMS/EPA Regulatory Model – AERMOD.* U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards, Emissions Monitoring and Analysis Division. EPA-454/B-03-001. September 2004. (Section 3.3.2.2)

3. *State of Idaho Guideline for Performing Air Quality Impact Analyses.* Idaho Department of Environmental Quality. September 2013. State of Idaho DEQ Air Doc. ID AQ-011. Available at http://www.deq.idaho.gov/media/1029/modeling-guideline.pdf.