Air Quality Permitting
Statement of Basis

June 26, 2006

Permit to Construct No. P-060010

Clearwater Concrete, Inc.
Portable Concrete Batch Plant

Facility ID No. 777-00379

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AIR QUALITY DIVISION

FINAL

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Acronyms, Units, and Chemical Nomenclatures

acfm	actual cubic feet per minute
AFS	AIRS Facility Subsystem
AIRS	Aerometric Information Retrieval System
CCI	Clearwater Concrete, Incorporated
CO	carbon monoxide
cy/hr	cubic yard per hour
DEQ	Department of Environmental Quality
EPA	U.S. Environmental Protection Agency
HAPs	Hazardous Air Pollutants
IDAPA	a numbering designation for all administrative rules in Idaho promulgated in accordance with the Idaho Administrative Procedures Act
km	kilometer
lb/hr	pound per hour
MACT	Maximum Achievable Control Technology
NAAQS	National Ambient Air Quality Standards
NESHAP	National Emission Standards for Hazardous Air Pollutants
NO_x	nitrogen oxides
NSPS	New Source Performance Standards
PM	particulate matter
PM_{10}	particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers
PSD	Prevention of Significant Deterioration
PTC	permit to construct
Rules	Rules for the Control of Air Pollution in Idaho
SIC	Standard Industrial Classification
SIP	State Implementation Plan
SM	synthetic minor
SO_2	sulfur dioxide
T/yr	tons per year
UTM	Universal Transverse Mercator
VOC	volatile organic compound

1. PURPOSE

The purpose for this memorandum is to satisfy the requirements of IDAPA 58.01.01.200, Rules for the Control of Air Pollution in Idaho, for issuing permits to construct.

2. FACILITY DESCRIPTION

The facility is a portable truck mix concrete batch plant manufactured by Erie Strayer. The concrete batch plant consists of an aggregate storage bin, weigh batcher, silo, and conveyors, all supplied as one portable unit. The plant combines sand, gravel, cement, and water to produce concrete. Aggregate, sand, and coarse material are transferred by conveyor from bins to a truck mix for mixing onsite. Cement is measured and mixed in a batcher. From the batcher, the cement mixture is added to the aggregate at the truck loading location.

The cement silo, the weigh batcher, and the truck mix loadout are equipped with dust collectors. The silo dust collector is located at the top of the silo to capture particulate matter emitted during cement loading process. Electric power is supplied to the concrete batch plant from the local power grid.

3. FACILITY / AREA CLASSIFICATION

This facility is a portable concrete batch plant and may locate anywhere in the state of Idaho except for PM_{10} nonattainment areas. The primary Standard Industrial Classification (SIC) code for the facility is 3273. The facility is defined as a synthetic minor (SM) facility because without using the control system to control the particulates the potential to emit PM_{10} emissions would exceed 100 tons per year. The Aerometric Information Retrieval System (AIRS) classification is "SM". The AIRS data entry table is provided in Appendix A.

The facility is not subject to Prevention of Significant Deterioration (PSD) requirements, because its potential to emit is less than all applicable PSD major source thresholds: the facility is not a designated facility as defined by IDAPA 58.01.01.006.26; the facility is not major facility, as defined in IDAPA 58.01.01.205; and the facility is also not a Tier I source, as defined in IDAPA 58.01.01.006.102. The facility is not subject to any NSPS, NESHAP, or MACT requirement.

4. APPLICATION SCOPE

Clearwater Concrete, Inc. (CCI) has submitted a PTC application for a new portable concrete batch plant. This permit is the facility's initial permit.

4.1 Application Chronology

March 16, 2006	DEQ received PTC application from Clearwater Concrete, Inc. for a portable concrete batch plant and a diesel generator.
April 14, 2006	The PTC application was determined complete.
April 27, 2006	CCI submitted additional information.
May 3, 2006	CCI requested to review a draft PTC No. P-060010 prior to the final issuance.
April 28, 2006	An opportunity for public comment started on April 28, 2006, and ended on May 30, 2006. During this period no comments were received.

May 22, 2006	CCI submitted additional information.
June 7, 2006	DEQ sent Boise Regional Office a copy of draft PTC No. P-060010 for review.
June 12, 2006	DEQ sent CCI a copy of draft PTC No. P-060010 for review.

5. PERMIT ANALYSIS

This section of the Statement of Basis describes the regulatory requirements for this PTC action:

Equipment Listing

Table 5.1 contains the equipment listing and the emissions controls.

Table 5.1 EQUIPMENT LISTING AND EMISSIONS CONTROLS

Source Description	Emission Controls
Concrete Batch Plant Manufacturer: Erie Strayer Model: MG-11T Maximum Production Rate: 200 cubic yards per hour (cy/hr)	Reasonable control of fugitive dust
Cement Storage Silo	Cement storage silo dust collector: Manufacturer: C & W Model: CP-LPR-8-S, cartridge pulse silo collector PM_{10} control efficiency: 99.9% Silo stack parameters: Stack height: 75 ft Stack diameter: 3.8 ft Exit air flow: 2,340 acfm
Weigh Batcher and truck mix loading	Weigh batcher dust collector: Manufacturer: C&W Model: CP-35-219, pulse jet collector PM_{10} control efficiency: 99.99% Silo stack parameters: Stack height: 25 ft Stack diameter: 1.6 ft Exit air flow: 140 acfm

5.2 Emissions Inventory

Appendix B of this document contains the emissions estimates from the concrete batch plant for particulate matter (PM) and particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers (PM_{10}) and for the toxic air pollutant (TAPs). Emissions factors from the concrete batch plant were obtained from U.S. EPA's *Compilation of Air Pollutant Emission Factors*, AP-42, Section 11.12, Concrete Batching, 06/06.

Potential to emit was estimated assuming maximum production capacity of the concrete batch plant of 200 cubic yard per hour (cy/hr) and full time operations (8,760 hr/yr). Actual emissions will be considerably less because the facility does not operate 8,760 hr/yr. The emissions estimates show that no criteria air pollutant is emitted in an amount that exceeds the major source threshold of 100 T/yr.

Toxic air pollutant (TAPs) and hazardous air pollutants (HAPs) emissions estimates are shown in Appendix B. The emissions estimates shows that emissions of any single HAP is less than 10 T/yr. Emissions of two HAPs or more were estimated to be well below the major source threshold of 25 T/yr for a combination of two HAPs or more.

The emissions estimates presented in Appendix B of this document provided the basis for the PM_{10} emissions incorporated in the permit. They are also provided the basis for the NAAQS analysis and for determining the processing fee assessed in accordance with IDAPA 58.01.01.225.

A detailed emissions inventory from the facility is included in Appendix B.

5.3 Modeling

The DEQ's modeling memorandum concerning NAAQS and toxic air pollutants (TAP) is included in Appendix C of this statement of basis. The results show that the facility has demonstrated compliance wit NAAQS and with TAP increments.

5.4 Regulatory Review

This section describes the regulatory analysis of the applicable air quality rules with respect to this PTC.

IDAPA 58.01.01.201..... Permit to Construct Required

The CCI proposes to construct a new portable concrete batch plant that does not qualify for PTC exemption in any of Sections 220 through 223 of the Rules. Therefore, a PTC is required.

IDAPA 58.01.01.203..... Permit Requirements for New and Modified Stationary Sources.

Ambient air quality modeling has predicted the facility will not violate the National Ambient Air Quality Standards (NAAQS), and Toxic Air Pollutant increments.

It should be noted that emissions of arsenic exceeded the net screening emissions level. Therefore, emissions of arsenic were modeled and the results of the modeling analysis predicted that the emissions do not exceed the acceptable ambient concentrations for carcinogens (AACC) as listed in IDAPA 58.01.01.586. Thus, the facility demonstrated compliance with IDAPA 58.01.01.203.03.

IDAPA 58.01.01.625..... Visible Emissions

This regulation states that any point of emission shall not have a discharge of any air pollutant for a period aggregating more than three minutes in any 60-minute period of greater than 20% opacity. The emissions points at this facility are subject to this regulation.

5.5 Permit Conditions Review

Permit Condition 1.1 *Purpose* – states the purpose for this permitting action.

Permit Conditions 2.2 and 2.2 *Process Description and Emissions Control Description* – provide the plant process description and the emissions control description.

Permit Condition 2.3 *Emissions Limits* – sets the emissions limits for PM_{10} and arsenic. These emissions limits establish the facility potential to emit, 5.82 lbs/day PM_{10}. The potential to emit is based on the throughput limit in Permit Condition 2.5. The throughput limit in Permit Condition 2.5 limits the concrete production rate from the concrete batch plant to limit the facility's potential to emit below major source thresholds. The throughput limit was established taking into account the efficiency of the cement storage silo and the weigh batcher dust collectors. The arsenic emissions are in particulate form and controlled by C & W dust collection system. The controlled arsenic emissions exceeded the screening emissions level but the ambient impact of arsenic emissions complies with the AACC. In accordance with IDAPA 58.01.01.210.08, the modeled emission rates for arsenic are required to be included in the permit as emissions limits.

To demonstrate compliance with the emissions limits, the daily and annual concrete production rates are limited in Permit Condition 2.5 and the concrete production rates monitoring is required in Permit Condition 2.9. In Permit Condition 2.6, the dust collectors are required to operate in accordance with the O&M manual to ensure the control of particulate emissions.

Permit Condition 2.4 *Visible Emissions Limit* – establishes the visible emissions limit for stacks, vents, and openings in the plant.

To demonstrate compliance with the visible emissions limit, the permittee is required to conduct monthly visible emissions inspection as specified in Permit Condition 2.10. The permittee is required to operate the dust collectors in accordance with the O&M manual in Permit Condition 2.6.

Permit Conditions 2.7, 2.8, and 2.11 require the permittee to control fugitive dust emissions in accordance with IDAPA 58.01.01.650-651.

Permit Condition 2.12 requires the permittee not to operate the concrete batch plant in any PM_{10} nonattaiment area. Should the permittee desire to operate at PM_{10} nonattainment areas, this permit condition requires the permittee to submit a PTC application to modify this permit

Permit Condition 2.13 requires the permittee to register the concrete batch plant whenever relocated.

6. PERMIT FEES

Clearwater Concrete, Inc. paid the PTC application fee on April 6, 2005. In accordance with IDAPA 58.01.01.225, a PTC processing fee of $1,000.00 is required because the increase of emissions is less than 1.0 T/yr. The processing fee was received on June 28, 2006.

Table 6.1 PTC PROCESSING FEE TABLE

Emissions Inventory			
Pollutant	**Annual Emissions Increase (T/yr)**	**Annual Emissions Reduction (T/yr)**	**Annual Emissions Change (T/yr)**
NO_X	0.0	0	0.0
SO_2	0.0	0	0.0
CO	0.0	0	0.0
PM_{10}	0.21	0	0.21
VOC	0.0	0	0.0
TAPS/HAPS	0.00	0	0.0
Total:	0.21	0	0.21
Fee Due	$1,000.00		

7. PERMIT REVIEW

7.1 *Regional Review of Draft Permit*

DEQ's Boise Regional Office was provided the draft permit for review on June 7, 2006. The Boise Regional Office did not provide comments.

7.2 *Facility Review of Draft Permit*

The facility was provided the draft permit for review on June 12, 2006. The facility did not provide any comments.

7.3 Public Comment

An opportunity for public comment period on the PTC application was provided in accordance with IDAPA 58.01.01.209.01.c. from April 28, 2006, through May 30, 2006. During this time, there were no comments on the application and no requests for public comment period on DEQ's proposed action.

8. RECOMMENDATION

Based on review of application materials, and all applicable state and federal rules and regulations, staff recommends that Clearwater Concrete, Inc. be issued final PTC No. P-060010. An opportunity for public comment on the air quality aspects of the proposed PTC was provided in accordance with IDAPA 58.01.01.209.01.c. No public comment period is recommended, no entity has requested a comment period, and the project does not involve PSD requirements.

HE/bf Permit No. P-060010

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Appendix A

Clearwater Concrete, Inc.
Portable

P-060010

AIRS Information

AIRS/AFS[a] FACILITY-WIDE CLASSIFICATION[b] DATA ENTRY FORM

Facility Name: Clearwater Concrete, Incorporated – Portable batch plant
Facility Location: Portable
AIRS Number: 777-00379

AIR PROGRAM POLLUTANT	SIP	PSD	NSPS (Part 60)	NESHAP (Part 61)	MACT (Part 63)	SM80	TITLE V	AREA CLASSIFICATION A-Attainment U-Unclassified N- Nonattainment
SO_2	--							U
NO_x	--							U
CO	--							U
PM_{10}	SM						SM	U
PT (Particulate)	SM						SM	
VOC	--							U
THAP (Total HAPs)	B							
			APPLICABLE SUBPART					

[a] Aerometric Information Retrieval System (AIRS) Facility Subsystem (AFS)

[b] AIRS/AFS Classification Codes:

A = Actual or potential emissions of a pollutant are above the applicable major source threshold. For HAPs only, class "A" is applied to each pollutant which is at or above the 10 T/yr threshold, or each pollutant that is below the 10 T/yr threshold, but contributes to a plant total in excess of 25 T/yr of all HAPs.

SM = Potential emissions fall below applicable major source thresholds if and only if the source complies with federally enforceable regulations or limitations.

B = Actual and potential emissions below all applicable major source thresholds.

C = Class is unknown.

ND = Major source thresholds are not defined (e.g., radionuclides).

Appendix B

Clearwater Concrete, Inc.
Portable

P-060010

Emissions Inventory

Appendix C

Clearwater Concrete, Inc.
Portable

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Modeling Review

MEMORANDUM

DATE: June 26, 2006

TO: Harbi Elshafei, Permit Writer, Air Program

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

PROJECT NUMBER: P-060010

SUBJECT: Modeling Review for the Clearwater Concrete, Inc. Permit to Construct Application for a new Portable Ready-Mix Concrete Plant

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1.0 Summary

Clearwater Concrete, Inc. (Clearwater) submitted a Permit to Construct (PTC) application for a portable ready-mix concrete batch plant. DEQ conducted air quality analyses involving atmospheric dispersion modeling of emissions associated with operation of the plant 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).

The modeling 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 either; a) that predicted pollutant concentrations from emissions associated with the proposed facility were below significant contribution levels (SCLs); or b) that predicted pollutant concentrations from emissions associated with the facility, when appropriately combined with background concentrations, were below applicable air quality standards at all receptor locations. Table 1 presents key assumptions and results that should be considered in the development of the permit.

Table 1. KEY ASSUMPTIONS USED IN MODELING ANALYSES

Criteria/Assumption/Result	Explanation/Consideration
Impacts for the facility were based on generic modeling analyses conducted for a hypothetical facility, with impacts scaled by the proposed production rates.	Although the actual plant configuration may vary from that used for the generic modeling analyses, DEQ air modeling staff have determined the generic analyses appropriately represent impacts from facility operations.
An arsenic emissions limit should be specified in the permit.	Controlled arsenic emissions were used to demonstrate compliance with the AACC.

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 Clearwater facility will only be located in areas designated as an attainment or unclassifiable for particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers (PM_{10}). Because there are no emissions of sulfur dioxide (SO_2), nitrogen dioxide (NO_2), carbon monoxide (CO), or ozone (O_3) associated with operation of the ready-mix plant, the area classification for these pollutants has no impact on location restrictions for the plant.

2.1.2 *Significant and Full Impact Analyses*

If estimated maximum pollutant impacts to ambient air from the emissions sources associated with the ready-mix plant exceed the significant contribution levels (SCLs) of IDAPA 58.01.01.006.90, then a full impact analysis is necessary to demonstrate compliance with IDAPA 58.01.01.203.02. A full impact analysis for attainment area pollutants involves adding ambient impacts from facility-wide emissions 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 National Ambient Air Quality Standards (NAAQS) listed in Table 2. Table 2 also lists SCLs and specifies the modeled value that must be used for comparison to the NAAQS.

Table 2. APPLICABLE REGULATORY LIMITS

Pollutant	Averaging Period	Significant Contribution Levels[a] ($\mu g/m^3$)[b]	Regulatory Limit[c] ($\mu g/m^3$)	Modeled Value Used[d]
PM_{10}[e]	Annual	1.0	50[f]	Maximum 1st highest[g]
	24-hour	5.0	150[h]	Maximum 6th highest[i]
Carbon monoxide (CO)	8-hour	500	10,000[j]	Maximum 2nd highest[g]
	1-hour	2,000	40,000[j]	Maximum 2nd highest[g]
Sulfur Dioxide (SO_2)	Annual	1.0	80[f]	Maximum 1st highest[g]
	24-hour	5	365[j]	Maximum 2nd highest[g]
	3-hour	25	1,300[j]	Maximum 2nd highest[g]
Nitrogen Dioxide (NO_2)	Annual	1.0	100[f]	Maximum 1st highest[g]
Lead (Pb)	Quarterly	NA	1.5[k]	Maximum 1st highest[g]

[a] IDAPA 58.01.01.006.90
[b] Micrograms per cubic meter
[c] IDAPA 58.01.01.577 for criteria pollutants
[d] The maximum 1st highest modeled value is always used for significant impact analysis
[e] Particulate matter with an aerodynamic diameter less than or equal to a nominal ten micrometers
[f] Never expected to be exceeded in any calendar year
[g] Concentration at any modeled receptor
[h] Never expected to be exceeded more than once in any calendar year
[i] Concentration at any modeled receptor when using five years of meteorological data
[j] Not to be exceeded more than once per year

2.2 Background Concentrations

Background concentrations were revised for all areas of Idaho by DEQ in March 2003[1]. Background concentrations in areas where no monitoring data are available were based on monitoring data from areas with similar population density, meteorology, and emissions sources. Default rural/agricultural PM_{10} background concentrations of 73 $\mu g/m^3$ for the 24-hour averaging period and 26 $\mu g/m^3$ for the annual averaging period were used because ready-mix batch plants are typically located outside of urban areas.

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

3.0 Modeling Impact Assessment

3.1 Modeling Methodology

Table 3 provides a summary of the modeling parameters used in analyses.

Table 3. MODELING PARAMETERS		
Parameter	**Description/Values**	**Documentation/Additional Description**
Model	ISC-PRIME	ISC-PRIME version 04269
Meteorological data	1987-1991	Boise, Idaho, surface and upper air data
Terrain	Not Considered	Initial location of plant is effectively flat
Building downwash	Considered	The building profile input program (BPIP-PRIME) was used
Receptor grid	Grid 1	25-meter spacing along boundary out about 100 meters
	Grid 2	50-meter spacing out about 600 meters

*Universal Transverse Mercator

3.1.1 Modeling protocol and Methodology

DEQ conducted the modeling analyses; therefore, a modeling protocol was not submitted. Modeling was conducted using methods and data presented in the *State of Idaho Air Quality Modeling Guideline.*

A generic plant configuration for the ready-mix plant was used because of the potable nature of the facility. Emissions sources were located within a 20-meter by 20-meter area, and the ambient air boundary was assumed to be a 100-meter radius from the center of the emissions source area. Downwash from any buildings and equipment was accounted for by modeling effects from a 20-meter by 20-meter building, 10 meters high, centered on the emissions area.

3.1.2 Model Selection

ISC-PRIME was used by DEQ to conduct the ambient air analyses. ISC-PRIME utilizes the PRIME downwash algorithm that is superior to the downwash algorithm used in ISCST3. AERMOD, the dispersion model replacing ISCST3, also utilizes the PRIME downwash algorithm.

3.1.3 Meteorological Data

Highly representative meteorological data are not available for the primary plant location near Donnelly, Idaho. Boise, Idaho, meteorological data were used for the ambient air quality analyses since that is the closest location where model-ready meteorological data are available.

PCRAMMET, the meteorological data preprocessor for ISCST-3, occasionally generates unrealistically low mixing heights as a result of interpolation algorithms used with the twice daily measured mixing heights. The modeling analyses were conducted using meteorological data corrected for low mixing heights. All mixing height values below 50 meters were replaced with a value of 50 meters.

3.1.4 Terrain Effects

DEQ determined it would not be appropriate to consider terrain effects because the plant is portable and the topography of future plant locations cannot be reasonably anticipated. Because maximum air quality impacts from most concrete batch plants are very near the source, typically at the property boundary, assuming the modeling domain is flat should not substantially affect the accuracy of the model analyses.

3.1.5 *Facility Layout*

A generic, hypothetical plant layout was used because of the portable and dynamic nature of the equipment used. A 20-meter by 20-meter building, 10 meters high, was located at the center of the facility. Table 4 describes the modeled locations of emissions sources.

Table 4. LOCATIONS OF EMISSIONS SOURCES

Emissions Source - Description	Source Type	Source Location[a]		Size of Volume Source (meters)
		Easting Location (meters)	Northing Location (meters)	
SILO – storage silo filling baghouse	Point	0	10	NA
WEIGHOP – weigh hopper loading baghouse	Point	0	0	NA
AGG&SAN – aggregate/sand to/from storage pile	Volume	10	0	50 x 50 x 3
AGGTOST – aggregate/sand to elevated storage	Volume	10	10	5 x 5 x 10
TRUCKLO – truck loading	Volume	0	0	10 x 10 x 10

[a]The center of the facility is at 0 meters east and 0 meters north, located at the center of a 20 meter by 20 meter building.

3.1.6 *Building Downwash*

Potential plume downwash effects caused by structures and equipment potentially associated with the facility were accounted for in the modeling analyses by incorporating a 20-meter by 20-meter building, 10 meters high. The Building Profile Input Program for the PRIME algorithm (BPIP-PRIME) was used to calculate direction-specific building dimensions and Good Engineering Practice (GEP) stack height information from building dimensions/configurations and emissions release parameters for ISC-PRIME.

3.1.7 *Ambient Air Boundary*

The property boundary was assumed to be 100 meters from the center of the facility. DEQ assumed reasonable measures would be taken to ensure the general public are excluded from access to the property.

3.1.8 *Receptor Network*

The receptor grid used met the minimum recommendations specified in the *State of Idaho Air Quality Modeling Guideline*. DEQ determined the receptor grid was adequate to reasonably resolve maximum modeled concentrations.

3.1.9 *Modeling Methodology*

Generic modeling was conducted in support of permitting ready-mix concrete batch plants. This modeling assumed a throughput of 1,500 yd^3/day and 500,000 yd^3/year. Impacts for other throughput values are calculated by multiplying the generic modeling result by a ratio of potential throughput to 1,500 yd^3/day or 500,000 yd^3/year.

3.2 *Emission Rates*

Emissions rates used in the generic ready-mix concrete batch plant dispersion modeling analyses were based on emissions factors from EPA's AP-42 Section 11.12 (June 2006), Concrete Batching. Emissions estimates specifically for the Clearwater plant were based on maximum throughputs of 700 yd^3/day and 50,000 yd^3/year and were calculated by multiplying emissions rates for the generic modeling by a ratio of

the potential throughput to the throughput used in the generic modeling (700/1,500 for 24-hour and 50,000/500,000 for annual).

3.2.1 Fugitive Dust Emissions from Sand and Aggregate Handling

The modeling of fugitive emissions from sand and aggregate handling are a function of wind speed, as indicated in EPA's AP-42, Section 13.2.4:

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

E = PM_{10} Emission factor (lb/ton)
k = Particle size multiplier (0.35 for PM_{10})
U = Wind speed (miles per hour)
M = Material moisture content (percent)

AP-42 draft Section 11.12 (Ready-Mix Concrete Batch Plants) suggested moisture content values of 1.77 percent for aggregate and 4.17 for sand.

The base material handling emissions calculated for input to the model were based on a wind speed of 10 miles per hour (4.5 meters per second). Sand and aggregate handling emissions occur from three sources, including: 1) sand and aggregate to outside storage; 2) sand and aggregate from outside storage to conveyor; 3) sand and aggregate from conveyor to elevated storage. The first two sources types (sand and aggregate handling to the storage pile and handling from the storage pile to a conveyor) were grouped together for modeling purposes. Table 5 summarizes PM_{10} emissions from sand and aggregate handling for the generic modeling, at 1,500 yd^3/day and 500,000 yd^3/year throughput, and for the Clearwater plant-specific modeling, at 700 yd^3/day and 50,000 yd^3/year.

Table 5. PM_{10} EMISSIONS FROM AGGREGATE AND SAND HANDLING

Criteria	Aggregate	Sand	Combined Sand and Aggregate
Base Emissions Factor	3.27E-3 lb/ton	9.86E-4 lb/ton	
Generic modeling emissions for 1,500 yd^3/day-point	0.179 lb/hr	0.0440 lb/hr	0.223 lb/hr
Clearwater emissions for 700 yd^3/day-point	0.0837 lb/hr	0.0205 lb/hr	0.104 lb/hr
Clearwater AGG&SAN[a] daily rate	0.167 lb/hr	0.0411 lb/hr	0.208 lb/hr
Clearwater AGGTOST[b] daily rate	0.0837 lb/hr	0.0205 lb/hr	0.104 lb/hr
Generic modeling emissions for 500,000 yd^3/year-point	0.164 lb/hr	0.0402 lb/hr	0.204 lb/hr
Clearwater emissions for 50,000 yd^3/year-point	0.0164 lb/hr	0.00402 lb/hr	0.0204 lb/hr
Clearwater AGG&SAN[a] annual rate	0.0328 lb/hr	0.00804 lb/hr	0.0408 lb/hr
Clearwater AGGTOST[b] annual rate	0.0164 lb/hr	0.00402 lb/hr	0.0204 lb/hr

[a]Includes two emissions points for sand and aggregate handling: 1) transfer to storage pile; 2) transfer to conveyor. Emissions for 700 yd^3/day throughput.
[b]Includes only transfer from conveyor to elevated storage. Emissions for 50,000 yd^3/year.

DEQ modeling used six emissions rates calculated at different wind speeds, then used an option within ISC to vary emissions as a function of wind speed. The base emissions calculated at 10 miles per hour were left unchanged, but adjustment factors were used as a function of wind speed for each hour modeled. ISC uses default wind speed categories with upper wind speeds in each category of 1.54 m/sec, 3.09 m/sec, 5.14 m/sec, 8.23 m/sec, and 10.8 m/sec. The sixth wind speed category does not have an upper bound. Emissions were calculated for each category using the midpoint of the wind speed. For category 1, a lower bound of 0.0 m/sec was used, and for category 6 an upper bound of 14 m/sec was used. Table 6 shows the emissions adjustment factor for each wind speed category.

3.2.2 Total Facility Emissions

Table 7 and Table 8 list criteria emissions rates for sources included in the short-term and long-term dispersion modeling analyses, respectively. Emissions rates in the tables are representative of Clearwater operations of 700 yd^3/day and 50,000 yd^3/year. Truck loading emissions are captured and routed to the silo filling baghouse. Emissions were calculated by assuming 99.85 percent of uncontrolled emissions are captured, resulting in 0.15 percent of uncontrolled emissions at the truck loading point. Controlled emissions from truck loading were added to emissions values for the storage silo baghouse stack.

Table 6. WIND SPEED ADJUSTMENT FACTORS FOR SAND AND AGGREGATE HANDLING EMISSIONS

Wind Speed Category	Midpoint Wind Speed for Category (m/sec (mph))	Emissions Adjustment Factor[a]
1	0.77 (1.72)	0.101
2	2.32 (5.18)	0.425
3	4.12 (9.20)	0.897
4	6.69 (14.95)	1.69
5	9.52 (21.28)	2.67
6	12.4 (27.74)	3.77

[a]Applied to the base emissions or emissions factor calculated for a wind speed of 10 mph.

Table 7. MODELED EMISSIONS RATES FOR SHORT-TERM (24-HOUR AND LESS)

Source Id	Description	Emission Rates (lb/hr)[a]
		PM_{10}[b]
SILO	Storage silo filling baghouse[c]	0.224
WEIGHOP	Weigh hopper loading baghouse	0.115
Fugitive Emissions Sources		
AGG&SAN	Aggregate/sand to/from storage pile[d]	0.209[f]
AGGTOST	Aggregate/sand to elevated storage[e]	0.104[f]
TRUCKLO	Truck loading	0.0038

[a]Pound per hour emissions
[b]Particulate matter with an aerodynamic diameter less than or equal to a nominal ten micrometers
[c]Includes controlled emissions from cement and supplement transfer to the storage silo and controlled emissions from truck loading
[d]Includes two transfer points for both sand and aggregate
[e]Includes one transfer point for both sand and aggregate
[f]Emissions in the table are based on emissions calculated for a 10 mph wind speed; actual emissions will vary with wind speed as indicated in Table 6.

Table 8. MODELED EMISSIONS RATES FOR LONG-TERM (ANNUAL)		
Source Id	Description	Emission Rates (lb/hr)[a]
		PM_{10}[b]
SILO	Storage silo filling baghouse	0.0438
WEIGHOP	Weigh hopper loading baghouse[c]	0.0226
Fugitive Emissions Sources		
AGG&SAN	Aggregate/sand to/from storage pile[d]	0.0408[f]
AGGTOST	Aggregate/sand to elevated storage[e]	0.0204[f]
TRUCKLO	Truck loading	0.00075

[a]Pound per hour emissions
[b]Particulate matter with an aerodynamic diameter less than or equal to a nominal ten micrometers
[c]Includes controlled emissions from cement and supplement transfer to the storage silo and controlled emissions from truck loading
[d]Includes two transfer points for both sand and aggregate
[e]Includes one transfer point for both sand and aggregate
[f]Emissions in the table are based on emissions calculated for a 10 mph wind speed; actual emissions will vary with wind speed as indicated in Table 6.

Table 9 lists applicable TAP emissions increases associated with the ready-mix concrete batch plant. Total TAP emissions of all other TAPs were below applicable screening emissions levels (ELs) and modeling was not required.

Table 9. TAP EMISSIONS RATES USED IN MODELING		
TAP	TAP Emissions Rates (lb/hr)	
	SILO[b]	TRUCKLO
Arsenic	2.08E-6	7.33E-9

[a]Pounds per hour
[b]Includes controlled emissions from cement and supplement transfer to the storage silo and controlled emissions from truck loading
[c]Value for emissions not captured and controlled by the storage silo baghouse

3.3 *Emission Release Parameters*

Table 10 provides emissions release parameters, including stack height, stack diameter, exhaust temperature, and exhaust velocity.

Table 10. EMISSIONS AND STACK 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]
SILO	Point	22.9	1.2	0 (ambient)	1.0
WEIGHOP	Point	7.6	0.5	0 (ambient)	0.35
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&SAN	Volume	1.5	11.6	0.7	
AGGTOST	Volume	5	1.16	4.65	
TRUCKLO	Volume	5	2.33	4.65	

[a]Meters
[b]Kelvin
[c]Meters per second

3.4 Results for Significant and Full Impact Analyses

Compliance with NAAQS was demonstrated using full impact analyses. Results of preliminary significant impact analyses are not presented. Results of the full impact analyses are presented in Table 11.

Table 11. RESULTS OF FULL IMPACT ANALYSES

Pollutant	Averaging Period	Maximum Modeled Concentration ($\mu g/m^3$)[a]	Background Concentration ($\mu g/m^3$)	Total Ambient Impact ($\mu g/m^3$)	NAAQS[b] ($\mu g/m^3$)	Percent of NAAQS
PM_{10}[c]	24-hour	23.3[d]	73	96.3	150	64
	Annual	1.3[e]	26	27.3	50	55

[a]Micrograms per cubic meter
[b]National ambient air quality standards
[c]Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers
[d]Maximum 6th highest modeled concentration from modeling a five-year meteorological data set
[e]Maximum 1st highest modeled concentration from modeling each of five years separately

3.5 Results for TAPs Analyses

Compliance with TAP increments were demonstrated by modeling controlled TAP emissions (those TAPs with emissions exceeding the ELs) from silo loading and truck loading operations. An emissions limit for the modeled TAP arsenic is needed in the permit, as per IDAPA 58.01.01.210.08.c, since impacts of controlled emissions were used to demonstrate compliance. Table 10 summarizes the ambient TAP analyses.

Table 13. RESULTS OF TAP ANALYSES

TAP	Averaging Period	Maximum Modeled Concentration ($\mu g/m^3$)[a]	AACC ($\mu g/m^3$)	Percent of AACC
Arsenic	Annual	2.86E-5	2.3E-4	12

[a]Micrograms per cubic meter

4.0 Conclusions

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