State of Idaho
Department of Environmental Quality
Air Quality Division

AIR QUALITY PERMIT
STATEMENT OF BASIS

Permit to Construct No. P-2009.0004

Final

Low's Ready Mix, Inc.

Caldwell Facility

Caldwell, Idaho

Facility ID No. 027-00094

April 27, 2009

Darrin Pampaian

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.

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Acronyms, Units, and Chemical Nomenclature

acfm	actual cubic feet per minute
AFS	AIRS Facility Subsystem
AIRS	Aerometric Information Retrieval System
AQCR	Air Quality Control Region
CAA	Clean Air Act
CBP	concrete batch plant
CFR	Code of Federal Regulations
CO	carbon monoxide
cy	cubic yards
cy/hr	cubic yards per hour
cy/day	cubic yards per day
cy/yr	cubic yards in any consecutive 12-calendar month period
DEQ	Department of Environmental Quality
EPA	U.S. Environmental Protection Agency
HAP	hazardous air pollutant
IDAPA	a numbering designation for all administrative rules in Idaho promulgated in accordance with the Idaho Administrative Procedures Act
lb/hr	pounds per hour
$\mu g/m^3$	micrograms per cubic meter
NAICS	North American Industry Classification System
NESHAP	National Emission Standards for Hazardous Air Pollutants
NO_2	nitrogen dioxide
NO_x	nitrogen oxides
NSPS	New Source Performance Standards
PC	permit condition
PM	particulate matter
PM_{10}	particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers
ppm	parts per million
PSD	Prevention of Significant Deterioration
PTC	permit to construct
PTE	potential to emit
Rules	Rules for the Control of Air Pollution in Idaho
scf	standard cubic feet
SIC	Standard Industrial Classification
SIP	State Implementation Plan
SM	Synthetic Minor
SO_2	sulfur dioxide
SO_x	sulfur oxides
TAP	toxic air pollutant
T2	Tier II operating permit
T2/PTC	Tier II operating permit and permit to construct
T/yr	tons per year
UTM	Universal Transverse Mercator
VOC	volatile organic compound

STATEMENT OF BASIS			
Permittee:	Low's Ready Mix, Inc.	**Permit No.**	P-2009.0004
Location:	Caldwell, Idaho	**Facility ID No.**	027-00094

1. FACILITY INFORMATION

1.1 Facility Description

This facility consists of an existing 260 cubic yards per hour (cy/hr) central mix concrete batch plant and a newly proposed 70 cy/hr truck mix plant. The central mix plant is manufactured by Erie Strayer Co. The components of the central mix plant are as follows: a four compartment aggregate storage bin, a 12 cubic yard (cy) aggregate batcher, a three compartment cement storage bin, a 12 cy cement batcher, and a 12 cy tilt mixer. The truck mix plant will be manufactured by Vince Hagan Co. The components of the truck mix plant are as follows: a three-stage aggregate storage bin, one cement storage silo, and an 8 cy weigh hopper.

The central mix plant combines sand, gravel, cement, and water to produce concrete. The truck mix plant combines sand, gravel, and cement and delivers it dry to the cement truck mixer where it is mixed with water to produce cement.

In addition, the facility also sells cement wholesale to other smaller concrete batch plants in the area.

1.2 Permitting Action and Facility Permitting History

This PTC is a modification of existing PTC P-050031 at an existing facility. The following information was derived from a review of the permit files available to DEQ. Permit status is noted as active and in effect (A) or superseded (S).

November 4, 2005	P-050031, Initial PTC was issued for the stationary concrete batch plant (A, but will become S upon issuance of this permit).

2. APPLICATION SCOPE AND APPLICATION CHRONOLOGY

2.1 Application Scope

This application modifies PTC P-050031 by permitting the installation of a new portable 70 cy/hr truck mix concrete batch plant, a new portable cement chain conveyor, and one additional cement storage silo at the existing facility.

2.2 Application Chronology

January 7, 2009	PTC project application P-2009.0004 was received by DEQ.
January 14-29, 2009	Notice was published and an opportunity for comment period was provided
February 2, 2009	Project P-2009.0004 was deemed complete.
March 30, 2009	DEQ sent a draft PTC to the facility for review.
April 8, 2009	The $1,000 PTC processing fee was received.
April 27, 2009	The final permit and statement of basis were issued.

3. TECHNICAL ANALYSIS

3.1 Emission Unit and Control Device

Table 3.1 EMISSION UNIT AND CONTROL DEVICE INFORMATION

Emission Unit/ID No.	Emissions Unit Description	Control Device Description	Emissions Discharge Point ID No. and/or Description
Central mix concrete batch plant with a 12 cubic yard Erie tilt mixer and a four compartment aggregate storage bin	Manufacturer: Erie Strayer Co. Model: N/A Max. Production Rate: 260 cy/hr Max. Daily Production: 6,240 cy/day Max. Annual Production: 2,277,600 cy/yr	Central mix dust collector Manufacturer: C&W Model: BP-790 Filtration area: 785 ft^2 Blower: 5,000 ACFM Cleaning Mechanism: Pulse jet PM_{10} control efficiency: 99.90%	CDCBH Exit height: 23.0 ft Exit diameter: 1.0 ft Exit flow rate: 5,000 acfm Exit velocity: 106.1 ft/s Exit temperature: 68.0 °F
Three compartment (North, Mid, and South) cement storage bin	Three cement storage silos	Three identical silo dust collectors Manufacturer: C&W Model: LPR-6-S Filtration area: 267 ft^2 Blower: 1,760 ACFM Cleaning Mechanism: Pulse jet PM_{10} control efficiency: 99.99%	NSILOBH MSILOBH SSILOBH Exit height: 84 ft Exit diameter: 0.39 ft Exit flow rate: 1,760 acfm Exit velocity: 2.8 ft/s Exit temperature: 68.0 °F
Central mix 12 cubic yard cement weigh batcher	Manufacturer: Erie Strayer Co. Model: N/A Capacity: 12 cy	Weigh batcher dust collector Manufacturer: C&W Model: CP-35 Filtration area: 36 ft^2 Blower: 140 ACFM Cleaning Mechanism: Pulse jet PM_{10} control efficiency: 99.99%	WHBH Exit height: 40.5 ft Exit diameter: 0.42 ft Exit flow rate: 140 acfm Exit velocity: 16.8 ft/s Exit temperature: 68.0 °F
Truck mix concrete batch plant with an 8 cubic yard weigh hopper and a three-stage aggregate storage bin	Manufacturer: Vince Hagan Co. Model: 8300-65A Max. Production Rate: 70 cy/hr Max. Daily Production: 1,680 cy/day Max. Annual Production: 613,200 cy/yr	Truck mix dust collector Manufacturer: Vince Hagan Model: VHW-160 Blower: 480 ACFM Cleaning Mechanism: Electric vibrator PM_{10} control efficiency: 99.8%	TMSILOBH Exit height: 25 ft Exit diameter: 2 ft Exit flow rate: 480 acfm Exit velocity: 2.5 ft/s Exit temperature: 68.0 °F
Portable chain conveyor	Make: RBT Model: 3600	Portable chain conveyor dust collector Manufacturer: Donaldson Model: UMA-100 Filtration area: 100 ft^2 Cleaning Mechanism: Shaker PM_{10} control efficiency: 99.4%	CCONV Exit height: 9 ft Exit diameter: 0.75 ft Exit flow rate: 600 acfm Exit velocity: 22.6 ft/s Exit temperature: 68.0 °F
Cement storage silo	Capacity: 2,500 tons	Railroad siding silo dust collector Manufacturer: C & W Model: CP-305 Filtration area: 356 ft^2 Cleaning Mechanism: Pulse jet PM_{10} control efficiency: 99.99%	N/A

[1] – Per the Applicant, emissions from the portable chain conveyor and the cement storage silo were modeled on a worst-case basis for the two sources. This was done since neither source operates at the same time. The worst-case of the two emissions sources was the portable chain conveyor. Therefore, emissions from the cement storage silo were not modeled.

3.2 Emissions Inventory

An emission inventory was developed for the central mix concrete batch plant, the four cement storage silos, the 12 cubic yard tilt mixer, the 12 cubic yard concrete weigh hopper, the truck mix concrete batch plant, and the portable chain conveyor (see Appendix B) associated with this proposed project. 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 (10/01), Concrete Batching.

Table 3.2 PRE-PROJECT CONTROLLED EMISSIONS ESTIMATES OF CRITERIA POLLUTANTS POTENTIAL TO EMIT

Emissions Unit	PM_{10}		SO_2		NO_x		CO		VOC		Lead	
	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr
Point Sources Affected by the Permitting Action												
Central mix concrete batch plant	0.352	1.54	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.68E-06	1.18E-05
Cement delivery, North silo	0.023	0.0996	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.88E-07	8.22E-06
Cement delivery, Mid silo	0.023	0.0996	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.88E-07	8.22E-06
Cement delivery South silo	0.023	0.0996	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.88E-07	8.22E-06
Central mix weigh batcher loading	0.00098	0.00428	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0
Pre-Project Totals, Point Sources	**0.42**	**1.84**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**5.92E-6**	**4.83E-5**
Emissions Unit	PM_{10}		SO_2		NO_x		CO		VOC		Lead	
	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr
Process Fugitive/Volume Sources Affected by this Permitting Action												
Aggregate and Sand Delivery to ground storage	0.310	1.36	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Aggregate and Sand Delivery to conveyor (260 cy/hr plant)	0.244	1.07	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Aggregate and Sand Delivery to elevated bin (260 cy/hr plant)	0.244	1.07	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pre-Project Totals, Process Fugitives	**0.80**	**3.50**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Table 3.3 POST PROJECT CONTROLLED EMISSIONS ESTIMATES OF CRITERIA POLLUTANTS POTENTIAL TO EMIT

Emissions Unit	PM_{10}		SO_2		NO_x		CO		VOC		Lead	
	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr
Point Sources Affected by the Permitting Action												
Central mix concrete batch plant	0.352	1.54	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.68E-06	1.18E-05
Cement delivery, North silo	0.023	0.0996	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.88E-07	8.22E-06
Cement delivery, Mid silo	0.023	0.0996	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.88E-07	8.22E-06
Cement delivery South silo	0.023	0.0996	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.88E-07	8.22E-06
Central mix weigh batcher loading	0.00098	0.00428	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0
Truck mix concrete batch plant and cement silo **(proposed new equipment)**	0.0184	0.0804	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.52E-06	6.64E-06
Portable chain conveyor **(proposed new equipment)**[1]	0.028	0.121	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.84E-07	3.86E-06
Cement storage silo **(proposed new equipment)** [1]	0.028	0.121	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.84E-07	3.86E-06
Post Project Totals, Point Sources	**0.50**	**2.17**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**8.33E-6**	**5.88E-5**

Emissions Unit	PM_{10}		SO_2		NO_x		CO		VOC		Lead	
	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr
Process Fugitive/Volume Sources Affected by this Permitting Action												
Aggregate and Sand Delivery to ground storage **(proposed increase in throughput)**	0.376	1.64	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Aggregate and Sand Delivery to conveyor (260 cy/hr plant)	0.244	1.07	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Aggregate and Sand Delivery to conveyor (70 cy/hr plant) **(proposed new throughput)**	0.066	0.29	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Aggregate and Sand Delivery to elevated bin (260 cy/hr plant)	0.244	1.07	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Aggregate and Sand Delivery to elevated bin (70 cy/hr plant) **(proposed new throughput)**	0.066	0.29	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Weigh hopper loading (70 cy/hr plant) **(proposed increase in throughput)**	0.066	0.29	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Truck loading (70 cy/hr plant) **(proposed new throughput)**	0.016	0.07	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Post Project Totals, Process Fugitives	**1.08**	**4.72**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

[1] – Per the Applicant, emissions from the portable chain conveyor and the cement storage silo were modeled on a worst-case basis for the two sources. This was done since neither source operates at the same time. The worst-case of the two emissions sources was the portable chain conveyor. Therefore, the worst-case emissions from the weigh-hopper loading were applied equally to both sources.

Table 3.4 CHANGES IN CONTROLLED EMISSIONS ESTIMATES OF CRITERIA POLLUTANTS POTENTIAL TO EMIT

	PM_{10}		SO_2		NO_X		CO		VOC		Lead	
	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr
Point Sources Affected by the Permitting Action												
Pre-Project Totals, Point Sources	0.42	1.84	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.92E-06	4.83E-05
Post Project Totals, Point Sources	0.50	2.17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.33E-06	5.88E-05
Facility Total Change in Emissions, Point Sources	**0.08**	**0.33**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**2.41E-06**	**1.05E-05**
	PM_{10}		SO_2		NO_x		CO		VOC		Lead	
	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr
Process Fugitive/Volume Sources Affected by this Permitting Action												
Pre-Project Totals, Process Fugitives	0.80	3.50	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Post Project Totals, Process Fugitives	1.08	4.72	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Facility Total Change in Emissions, Process Fugitives	**0.28**	**1.22**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.0**	**0.0**

Table 3.5 CONTROLLED TAP EMISSIONS SUMMARY POTENTIAL TO EMIT

Non-Carcinogenic Toxic Air Pollutants	24-hour Average Emissions Rates for Units at the Facility (lb/hr)	Non-Carcinogenic Screening Emission Level[3] (lb/hr)	Exceeds Screening Level? (Y/N)
Chromium metal	3.996E-05	0.033	N
Manganese dust	3.596E-04	0.333	N
Phosphorus	2.068E-04	0.007	N
Selenium	3.458E-06	0.013	N

Table 3.6 CONTROLLED TAP EMISSIONS SUMMARY POTENTIAL TO EMIT

Carcinogenic Toxic Air Pollutants	Annual Average Emissions Rates for Units at the Facility (lb/hr)	Carcinogenic Screening Emission Level[2] (lb/hr)	Exceeds Screening Level? (Y/N)
Arsenic compounds	**1.649E-05**	1.50E-06	**Y**
Beryllium & compounds	1.408E-06	2.8E-05	N
Cadmium and compounds	1.669E-07	3.7E-06	N
Chromium (VI) and compounds	**9.728E-06**	5.5E-07	**Y**
Nickel	**6.416E-05**	2.7E-05	**Y**

3.3 Ambient Air Quality Impact Analysis

Table 3.7 FULL IMPACT ANALYSIS RESULTS FOR CRITERIA POLLUTANT(S)

Pollutant	Averaging Period	Facility Ambient Impact (µg/m3)	Background Concentration (µg/m^3)	Total Ambient Concentration (µg/m^3)	NAAQS (µg/m^3)	Percent of NAAQS
PM_{10}	24-hour	33.25	73	106.25	150	70.8%
	Annual	9.86	26	35.86	50	71.7%
NO_2	Annual	N/A	N/A	N/A	100	N/A
SO_2	3-hr	N/A	N/A	N/A	1,300	N/A
	24-hr	N/A	N/A	N/A	365	N/A
	Annual	N/A	N/A	N/A	80	N/A
CO	1-hour	N/A	N/A	N/A	40,000	N/A
	8-hour	N/A	N/A	N/A	10,000	N/A
Pb	Quarterly	N/A	N/A	N/A	1.5	N/A

N/A: The emissions rate is below the modeling threshold; modeling is not required in accordance with State of Idaho Air Quality Modeling Guidance DEQ Publication, December 2002, or alternative threshold approved by DEQ Modeling Coordinator.

Table 3.8 FULL IMPACT ANALYSIS RESULTS FOR TAP(S)

Pollutant	Average Period	Concentration (mg/m^3 or µg/m^3)	Regulatory AAC/AACC (mg/m^3 or µg/m^3)	Percent of AAC/AACC
Arsenic compounds	Annual	0.0001	0.00023	43.5%
Chromium (VI) and compounds	Annual	0.00007	0.000083	84.3%
Nickel	Annual	0.00049	0.0042	11.7%

Note: AACs are in units of milligrams per meter cubed whereas AACCs are in units of micrograms per meter cubed. Convert AACs from milligrams per meter cubed to micrograms per meter cubed.

3.4 Origin of Existing Emissions Limits

PC 2.3 - Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometer (PM_{10}) emissions from the silo dust collectors, the central dust collector, and the weigh batcher dust collector stacks shall not exceed 1.52 tons per any consecutive 12-month period.

Origin: The annual PM_{10} emissions limit for the silo dust collectors, the central dust collector, and the weigh batcher dust collector was established by PTC No. P-050031, issued November 4, 2005, to protect the 24-hour NAAQS. This annual PM_{10} emissions limit will be revised upward as a result of this project.

PC 2.4 - The permittee shall not discharge any air pollutant into the atmosphere from any point of emission for a period or periods aggregating more than 20% opacity as required by IDAPA 58.01.01.625. Opacity shall be determined by the procedures contained in IDAPA 58.01.01.625.

Origin: The 20 % opacity limit was established to demonstrate compliance with IDAPA 58.01.01.625. Per current DEQ guidance this opacity limit will be changed to a see/no see visible emissions check as a result of this project. Note: The facility will no longer have to maintain records of the differential pressures across the various dust collectors at the facility.

P 2.5 - The cement throughput from the three cement storage silos shall not exceed 642,283 tons per any consecutive 12-month period.

Origin: The cement throughput limit was established by PTC No. P-050031, issued November 4, 2005, to limit PM_{10} emissions from the three cement storage silos as proposed by the Applicant.

4. REGULATORY REVIEW

4.1 Attainment Designation (40 CFR 81.313)

The Low's facility is located in Canyon County (AQCR 64), which is designated as unclassifiable/attainment for $PM_{2.5}$, PM_{10}, SO_2, NO_X, CO, and Ozone for federal and state criteria air pollutants. Reference 40 CFR 81.313.

4.2 Permit to Construct (IDAPA 58.01.01.201)

IDAPA 58.01.01.201 ..... Permit to Construct Required

The facility's proposed project does not meet the permit to construct exemption criteria contained in Sections 220 through 223 of the Rules. Therefore, a PTC is required.

4.3 Permit to Construct (IDAPA 58.01.01.203)

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

The facility's proposed project does not meet the permit to construct exemption criteria contained in Sections 220 through 223 of the Rules. Therefore, a PTC is required.

4.4 Tier II Operating Permit (IDAPA 58.01.01.401)

IDAPA 58.01.01.401 ..... Tier II Operating Permits

The facility is not subject to IDAPA 58.01.01.300 through 399 and is not requesting an optional Tier II operating permit. Therefore, the requirements of IDAPA 58.01.01.401 do not apply.

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

IDAPA 58.01.01.301 ..... Tier I Operating Permit

The facility is not a Tier I source in accordance with IDAPA 58.01.01.006.113. Therefore, the requirements of IDAPA 58.01.01.301 do not apply.

4.6 Visible Emissions (IDAPA 58.01.01.625)

IDAPA 58.01.01.312..... ..... 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 PTC condition 2.4.

4.7 Fugitive Dust Control (IDAPA 58.01.01.808)

IDAPA 58.01.01.808 ..... Fugitive Dust Control

This Rule requires that no person shall cause, allow or permit a plant to operate that is not equipped with an efficient fugitive dust control system. The system shall be operated and maintained in such a manner as to satisfactorily control the emission of particulate material from any point other than the stack outlet.

This Rule goes on to state that the owner or operator of the plant shall maintain fugitive dust control of the plant premises and plant owned, leased or controlled access roads by paving, oil treatment or other suitable measures. Good operating practices, including water spraying or other suitable measures, shall be employed to prevent dust generation and atmospheric entrainment during operations such as stockpiling, screen changing and general maintenance.

These requirements are assured by PTC conditions 2.10 and 2.11.

4.8 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), the PSD requirements do not apply.

4.9 NSPS Applicability (40 CFR 60)

The facility is not subject to any NSPS requirements.

4.10 NESHAP Applicability (40 CFR 61)

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

4.11 MACT Applicability (40 CFR 63)

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

4.12 CAM Applicability (40 CFR 64)

40 CFR 64 does not apply to this facility because it is not required to obtain a part 70 or 71 permit.

4.13 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.

Old Table 1.1 from PTC No. P-050031 has been updated to reflect the new sources of emissions (the truck mix concrete batch plant, the portable chain conveyor, and the cement storage silo) at the facility.

Old Permit Condition 2.2, Table 2.1, from PTC No. P-050031 has been updated per current DEQ guidance.

Old Permit Condition 2.3, Table 2.2, from PTC No. P-050031 has been updated to reflect the hourly and annual emissions from the units listed in Section 2.0 of the Permit per the emissions inventory submitted by the Applicant.

New Permit Condition 2.6 establishes an annual concrete throughput limit, in addition to the previous cement throughput limit, to limit annual PM_{10} emissions from the central mix concrete batch plant, the North, Mid, and South silos, and the weigh batcher.

Old Permit Conditions 2.6, 2.7, 2.8, and 2.9 from PTC No. P-050031 have been removed since these conditions dealt with the differential pressure requirements for the dust collectors which have been replaced by the requirement that the facility perform a daily see/no see emissions check on the bag houses (see new permit condition 2.7) per DEQ guidance.

New Permit Condition 2.7 requires that the permittee shall monitor and record visible emissions from the central mix concrete plant, the North, Mid, and South cement storage silos, or the central mix weigh batcher dust collector systems once per day when operating.

New Permit Condition 2.8 requires that the permittee shall develop a Baghouse/Filter System Procedures document for the inspection and operation of the baghouses/filter systems.

New Permit Condition 2.9 requires that the permittee shall control fugitive emissions generated by operations associated with the CBP facility to ensure that visible fugitive emissions do not extend beyond the facility property boundary.

Old Permit Condition 2.10 has been renumbered to new Permit Condition 2.10.

New Permit Condition 2.11 requires that the permittee shall immediately implement a strategy or strategies to control fugitive dust emissions under certain conditions.

New Permit Condition 2.12 requires that the permittee shall conduct a facility-wide inspection of potential sources of fugitive emissions, during daylight hours and under normal operating conditions once each calendar day the CBP facility operates, to ensure that the methods used to reasonably control fugitive emissions are effective.

Note: There is no Permit Conditions 2.11 listed on the current Permit.

Old Permit Condition 2.12 has been renumbered to new Permit Condition 2.13.

New Permit Condition 2.14 requires that the permittee monitor and record concrete production from the central mix concrete plant on a monthly and annual basis. This requirement is used to demonstrate compliance with the annual PM_{10} emissions limit for the central mix batch plant, the North, Mid, and South silos, and the weigh batcher.

New Permit Condition 2.15 requires that the permittee shall conduct a facility-wide inspection of potential sources of visible emissions during daylight hours and under normal operating conditions.

New Permit Condition 2.16 establishes that the permittee shall maintain records as required by General Provision 7.

New Permit Condition 3.3, Table 3.2, establishes hourly and annual PM_{10} emissions limits for the truck mix concrete batch plant, the portable chain conveyor, and the cement silo dust.

New Permit Condition 3.4 establishes a 20% opacity limit for the facility.

New Permit Condition 3.5 establishes an annual cement throughput limit to limit annual PM_{10} emissions from the truck mix concrete batch plant, the portable chain conveyor, and the cement storage silo.

New Permit Condition 3.6 establishes an annual concrete production limit to limit annual PM_{10} emissions from the truck mix concrete batch plant, the portable chain conveyor, and the cement storage silo.

New Permit Condition 3.7 requires that the permittee shall monitor and record visible emissions from the truck mix dust collector, the portable chain conveyor dust collector, and the cement silo dust collector systems once per day when operating.

New Permit Condition 3.8 requires that the permittee shall have developed a Baghouse/Filter System Procedures document for the inspection and operation of the baghouses/filter.

New Permit Condition 3.9 requires that the permittee monitor and record cement throughput from the truck mix concrete plant on a monthly and annual basis. This requirement is used to demonstrate compliance with the annual PM_{10} emissions limit for the central mix batch plant, the North, Mid, and South silos, and the weigh batcher.

New Permit Condition 3.10 requires that the permittee monitor and record concrete production from the truck mix concrete plant on a monthly and annual basis. This requirement is used to demonstrate compliance with the annual PM_{10} emissions limit for the truck mix concrete batch plant, the portable chain conveyor, and the cement storage silo.

New Permit Condition 3.11 establishes that the permittee shall maintain records as required by General Provision 7.

5. PERMIT FEES

Table 5.1 lists the processing fee associated with this permitting action. The facility is subject to a processing fee of $1,000.00 because its permitted increase in annual emissions is 0.33 T/yr (Note: Per Section 225 fugitive emissions are not included). Refer to the chronology for fee receipt dates.

Table 5.1 PTC PROCESSING FEE TABLE

Emissions Inventory			
Pollutant	**Annual Emissions Increase (T/yr)**	**Annual Emissions Reduction (T/yr)**	**Annual Emissions Change (T/yr)**
PM_{10}	0.33	0	0.33
SO_2	0.0	0	0.00
NO_X	0.0	0	0.00
CO	0.0	0	0.00
VOC	0.0	0	0.00
HAPS	0.0	0	0.0
Totals:	**0.33**	**0.00**	**0.33**
Fee Due	**$1,000.00 Based upon an annual increase in emissions of < 1 T/yr for a modification to an existing source**		

6. PUBLIC COMMENT

An opportunity for public comment period on the PTC application was provided from January 14, 2009 to January 29, 2009 in accordance with IDAPA 58.01.01.209.01.c. During this time, there were no comments on the application and there was not a request for a public comment period on DEQ's proposed action.

Appendix A – AIRS Information

AIRS/AFS Facility-wide Classification Form

Facility Name: Low's Ready Mix, Inc.

Facility Location: 10340 Highway 20/26, Caldwell ID 83605

Facility ID: 027-00094 **Date:** April 27, 2009

Project/Permit No.: P-2009.0004 **Completed By:** Darrin Pampaian

☒ Check if there are no changes to the facilitywide classification resulting from this action. (compare to form with last permit)

☐ Yes, this facility is an SM80 source.

Identify the facility's area classification as A (attainment), N (nonattainment), or U (unclassified) for the following pollutants:

	SO2	PM10	VOC
Area Classification:			

DO NOT LEAVE ANY BLANK

Check one of the following:

☐ **SIP** [0] - Yes, this facility is subject to SIP requirements. (do not use if facility is Title V)

OR

☐ **Title V** [V] - Yes, this facility is subject to Title V requirements. (If yes, do not also use SIP listed above.)

For SIP or TV, identify the classification (A, SM, B, C, or ND) for the pollutants listed below. Leave box blank if pollutant is not applicable to facility.

	SO2	NOx	CO	PM10	PT (PM)	VOC	THAP
Classification:							

☐ **PSD** [6] - Yes, this facility has a PSD permit.

If yes, identify the pollutant(s) listed below that apply to PSD. Leave box blank if pollutant does not apply to PSD.

	SO2	NOx	CO	PM10	PT (PM)	VOC	THAP
Classification:	☐	☐	☐	☐	☐	☐	☐

☐ **NSR - NAA** [7] - Yes, this facility is subject to NSR nonattainment area (IDAPA 58.01.01.204) requirements.

Note: As of 9/12/08, Idaho has no facility in this category.

If yes, identify the pollutant(s) listed below that apply to NSR-NAA. Leave box blank if pollutant does not apply to NSR - NAA.

	SO2	NOx	CO	PM10	PT (PM)	VOC	THAP
Classification:	☐	☐	☐	☐	☐	☐	☐

☐ **NESHAP** [8] - Yes, this facility is subject to NESHAP (Part 61) requirements. (THAP only)

If yes, what CFR Subpart(s) is applicable?

☐ **NSPS** [9] - Yes, this facility is subject to NSPS (Part 60) requirements.

If yes, what CFR Subpart(s) is applicable?

If yes, identify the pollutant(s) regulated by the subpart(s) listed above. Leave box blank if pollutant does not apply to the NSPS.

	SO2	NOx	CO	PM10	PT (PM)	VOC	THAP
Classification:	☐	☐	☐	☐	☐	☐	☐

☐ **MACT** [M] - Yes, this facility is subject to MACT (Part 63) requirements. (THAP only)

If yes, what CFR Subpart(s) is applicable?

Appendix B – Emissions Inventory

Process Data:

Table B.1 FACILITY MAXIMUM PRODUCTION RATES

Emissions Unit	Maximum Production Rate (cy/hr)	Maximum Production Rate (hrs/yr)	Maximum Production Rate (cy/yr)
Central Mix Batch Plant	260	8,760	**2,277,600**
Truck Mix Batch Plant	70	8,760	**613,200**
Facility Total	**330**	-	**2,890,800**

Table B.2 MATERIAL BALANCE

Raw Material	Composition (lb/cy)
Coarse Aggregate	1,865
Sand	1,428
Cement	491
Cement Supplement	73
Water (20 gallons)	167
Total (lbs)	**4,024**

Table B.3 AGGREGATE AND SAND TRANSFER EMISSIONS FACTORS

Source	Particle Size Multiplier "k" for PM_{10}	Average Wind Speed "U" (mph)	Moisture Content "M" (%)	Emissions Factor (lb-PM_{10}/T)
Aggregate Transfers	0.35	10	1.77	**0.00327**
Sand Transfers	0.35	10	4.17	**0.00099**
Weigh Hopper Loading	N/A	N/A	N/A	**0.00228**

1 – The predictive equation in AP-42, Section 13.2.2, (11/06)was used to calculate emission factors for fugitive particulate emissions from the transfers of aggregate and sand. The average wind speed and moisture values used in the equation are referenced in Table 11.12-2 of AP-42. The emission factors are calculated using the following formula.

$$\mathbf{EF\ (lb\text{-}PM_{10}) = (k \times 0.0032) \times [(U \div 5)^{1.3} \div (M \div 2)^{1.4}]}$$

Table B.4 CEMENT AND CEMENT SUPPLEMENT DELIVERY EMISSIONS FACTORS

Source	Emissions Factor (lb-PM_{10}/T)	Emissions Factor (lb-Lead/T)
Cement Delivery To Silos (controlled)	0.00034	1.08E-08
Cement Supplement Delivery To Silos (controlled)	0.0049	5.200E-07
Truck Mix Loading (uncontrolled)	0.0160	3.62E-06
Cement Mix Batching (controlled)	0.0048	3.66E-08

Table B.5 FACILITY-WIDE TOTAL POST PROJECT HOURLY AND ANNUAL PTE FOR PM_{10} EMISSIONS

Source	Control Efficiency (%)	Emissions Factor (lb-PM_{10}/ton)	Throughput (cy/yr)	Weight Content per Cu. Yard (lb/cy)	Annual Hours of Operation (hrs/yr)	Hourly Emissions (lb-PM_{10}/T)	Annual Emissions (T-PM_{10}/yr)
Aggregate delivery to ground storage	75	0.00327	2,890,800	1,865	8,760	**0.252**	**1.102**
Sand delivery to ground storage	75	0.00099	2,890,800	1,428	8,760	**0.058**	**0.2554**
Aggregate transfer to conveyor	75	0.00327	2,890,800	1,865	8,760	**0.252**	**1.102**
Sand transfer to conveyor	75	0.00099	2,890,800	1,428	8,760	**0.058**	**0.255**
Aggregate transfer to storage bins	75	0.00327	2,890,800	1,865	8,760	**0.252**	**1.102**
Sand transfer to storage bins	75	0.00099	2,890,800	1,428	8,760	**0.058**	**0.255**
Cement delivery to RR silo (controlled)	N/A	0.00034	2,890,800	491	8,760	**0.028**	**0.121**
Cement delivery to silos (controlled)	N/A	0.00034	2,890,800	491	8,760	**0.028**	**0.121**
Cement supplement delivery to silo (controlled)	N/A	0.0049	2,890,800	73	8,760	**0.059**	**0.259**
Weigh hopper loading - 70 yrd Plant[1]	75	0.00228	613,200	3,293	8,760	**0.066**	**0.288**
Weigh hopper loading - 260 yrd Plant[1]	99.9	0.00228	2,277,600	3,293	8,760	**0.001**	**0.004**
Truck Mix loading[2]	95	0.0160	613,200	564	8,760	**0.016**	**0.069**
Central Mix Batching (controlled)[2]	N/A	0.0048	2,277,600	564	8,760	**0.352**	**1.541**
					Facility Total	**1.48**	**6.474**

1 – Throughput for weigh hopper loading is the combination of coarse aggregate and sand (1,865 lbs/cy + 1,428 lbs/cy = 3,293 lbs/cy).

2 – Throughput for truck mix loading and central mix loading is the combination of cement and cement supplement (491 lbs/cy + 73 lbs/cy = 564 lbs/cy).

Table B.6 FACILITY-WIDE INCREASE PROPOSED HOURLY AND ANNUAL PTE FOR PM_{10} EMISSIONS

Source	Control Efficiency (%)	Emissions Factor (lb-PM_{10}/ton)	Throughput (cy/yr)	Weight Content per Cu. Yard (lb/cy)	Annual Hours of Operation (hrs/yr)	Hourly Emissions (lb-PM_{10}/T)	Annual Emissions (T-PM_{10}/yr)
Aggregate delivery to ground storage	75	0.00327	613,200	1,865	8,760	**0.053**	**0.234**
Sand delivery to ground storage	75	0.00099	613,200	1,428	8,760	**0.012**	**0.0542**
Aggregate transfer to truck mix conveyor	75	0.00327	613,200	1,865	8,760	**0.053**	**0.234**
Sand transfer to truck mix conveyor	75	0.00099	613,200	1,428	8,760	**0.012**	**0.054**
Aggregate transfer to truck mix storage bins	75	0.00327	613,200	1,865	8,760	**0.053**	**0.234**
Sand transfer to truck mix storage bins	75	0.00099	613,200	1,428	8,760	**0.012**	**0.054**
Cement delivery to RR silo (controlled)	N/A	0.00034	613,200	491	8,760	**0.006**	**0.026**
Cement delivery to truck mix silo (controlled)	N/A	0.00034	613,200	491	8,760	**0.006**	**0.026**
Cement supplement delivery to truck mix silo (controlled)	N/A	0.0049	613,200	73	8,760	**0.013**	**0.055**
Weigh hopper loading - 70 yrd Plant[1]	75	0.00228	613,200	3,293	8,760	**0.066**	**0.288**
Truck Mix loading[2]	95	0.0160	613,200	564	8,760	**0.016**	**0.069**
					Facility Total	**0.302**	**1.328**

1 – Throughput for weigh hopper loading is the combination of coarse aggregate and sand (1,865 lbs/cy + 1,428 lbs/cy = 3,293 lbs/cy).

2 – Throughput for truck mix loading and central mix loading is the combination of cement and cement supplement (491 lbs/cy + 73 lbs/cy = 564 lbs/cy).

Appendix C – Ambient Air Quality Impact Analysis

M E M O R A N D U M

DATE: April 15, 2009

TO: Darrin Pampaian, Air Quality Analyst, Air Program

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

PROJECT NUMBER: P-2009.0004

SUBJECT: Modeling Review for the Low's Ready Mix, Inc. Permit to Construct Application for Modifications involving a New Storage Silo and Conveyor System, and a New Portable Concrete Batch Plant, at their Facility in Caldwell, Idaho

1.0 SUMMARY

Low's Ready Mix, Inc. (Low's) submitted a Permit to Construct (PTC) application for modifications to their existing facility, located in Caldwell, Idaho. The application involved adding an additional storage silo and a cement chain conveyor. It also involved permitting a new portable truck-mix batch plant. Air quality analyses involving atmospheric dispersion modeling of increased emissions were performed to demonstrate the facility would not cause or significantly contribute to a violation of any ambient air quality standard (IDAPA 58.01.01.203.02 [Idaho Air Rules Section 203.02]). Spidell and Associates Environmental Consultants (Spidell), Low's consultant, performed the site-specific ambient air quality impact analyses.

A technical review of the submitted analyses was conducted by DEQ. The submitted analyses and information: 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 other applicable regulatory thresholds; or b) that predicted pollutant concentrations from emissions associated with the facility and any potentially co-contributing sources, when appropriately combined with background concentrations, were below applicable air quality standards at all locations outside of the facility's property boundary. Table 1 presents key assumptions and results that should be considered in the development of the permit.

Table 1. KEY CONDITIONS USED IN MODELING ANALYSES

Criteria/Assumption/Result	Explanation/Consideration
Modeling analyses easily demonstrated compliance with all applicable ambient air quality standards.	No special operational provisions or restrictions, beyond those described in the application, are needed in the permit to assure compliance with standards.

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 Low's facility is located near Caldwell, Idaho. The area is designated as attainment or unclassifiable for all criteria pollutants.

2.1.2 Significant and Cumulative NAAQS Impact Analyses

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

Table 2. APPLICABLE REGULATORY LIMITS

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

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

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

2.1.3 Toxic Air Pollutant Analyses

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

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

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

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

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

2.2 Background Concentrations

Background concentrations are used in the cumulative NAAQS impact analyses to account for impacts from sources not explicitly modeled. Table 3 lists appropriate background concentrations for the Caldwell area. Since the project only results in emissions increases for PM_{10} and lead, other pollutant background concentrations are not listed in Table 3.

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

Table 3. BACKGROUND CONCENTRATIONS

Pollutant	Averaging Period	Background Concentration ($\mu g/m^3$)[a]
PM_{10}[b]	24-hour	73
	Annual	26
Lead (Pb)	Quarterly	0.03

[a] Micrograms per cubic meter

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

3.0 MODELING IMPACT ASSESSMENT

3.1 Modeling Methodology

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

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

3.1.1 Overview of Analyses

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

Table 4. MODELING PARAMETERS		
Parameter	**Description/Values**	**Documentation/Addition Description[a]**
General Facility Location	Caldwell, Idaho	
Model	AERMOD	AERMOD with the PRIME downwash algorithm, version 07026
Meteorological Data	Boise	Model-ready data provided by DEQ – 1988 through 1992
Terrain	Considered	Receptor, building, and emissions source elevations were determined using Digital Elevation Model (DEM) files
Building Downwash	Considered	Buildings present on the site that could reasonably cause plume downwash were included in the analyses through the use of the BPIP-PRIME program
Receptor Grid	Grid 1	25-meter spacing along the property boundary out to 200 meters
	Grid 2	50-meter spacing out to 400 meters
	Grid 3	100-meter spacing out to 1,000 meters

3.1.2 Modeling protocol and Methodology

Refined air impact analyses were performed by Spidell. A modeling protocol was submitted to DEQ prior to the application and DEQ provided conditional approval of the protocol to Spidell. Modeling was generally conducted using data and methods described in the protocol and/or in the *State of Idaho Air Quality Modeling Guideline*.

3.1.3 Model Selection

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

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

AERMOD offers the following improvements over ISCST3:

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

AERMOD was used in the submitted analyses.

3.1.4 Meteorological Data

Five years of hourly meteorological data collected from a National Weather Service tower at the Boise Airport were used in the modeling analyses. These data were preprocessed by DEQ and were provided to Spidell in model-ready format. DEQ has determined these data are reasonably representative meteorological data for use in this dispersion modeling analyses in the Caldwell area.

3.1.5 Terrain Effects

Terrain effects on dispersion were considered in the analyses. Receptor elevations and hill heights were obtained by Spidell using AERMAP and Digital Elevation Model (DEM) 7.5-minute files.

3.1.6 Building Downwash

Downwash effects potentially caused by structures at the facility were accounted for in the dispersion modeling analyses. The Building Profile Input Program for the PRIME downwash 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 AERMOD.

3.1.7 Ambient Air Boundary

The establishment of the ambient air boundary used in the analyses was not described in the submitted application. However, the submitted plot plan indicated the property boundary was used as the boundary to ambient air. DEQ assumed reasonable measures will be taken by the facility to preclude public access to the property.

3.1.8 Receptor Network

Table 4 describes the receptor grid used in the submitted analyses. The receptor grid met the minimum recommendations specified in the *State of Idaho Air Quality Modeling Guideline*. DEQ determined this grid assured maximum impacts were reasonably resolved by the model.

3.2 Emission Rates

Emissions rates used in the modeling analyses for the proposed project were equal to those presented in other sections of the permit application or the DEQ Statement of Basis.

3.2.1 Criteria Pollutant Emissions Rates

Emissions increases of PM_{10} and lead exceeded modeling threshold values established in the *State of Idaho Air Quality Modeling Guideline*. Table 5 provides PM_{10} and lead facility-wide emissions used in the modeling analyses. Since a cumulative impact analysis was used to demonstrate compliance with NAAQS, only facility-wide emissions are provided in this memorandum. Emissions associated with only the proposed project were not listed because results from modeling these emissions exceeded significant contribution levels and a cumulative impact analysis was then required to demonstrate compliance.

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

Emissions are calculated using the following emissions equation:

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

Where:

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

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

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

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

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

Base factor – use 10 mph wind: $0.35(0.0032)\frac{(10/5)^{1.3}}{(5/2)^{1.4}} = 7.646\ E-4$ lb/ton

Adjustment factors to put in the model:

Cat 1: $(1.72/5)^{1.3}$ (3.105 E-4) = 7.756 E-5 lb/ton
Factor = 7.756 E-5/7.646 E-4 = 0.1014

Cat 2: $(5.18/5)^{1.3}$ (3.105 E-4) = 3.251 E-4 lb/ton
Factor = 3.251 E-4/ 7.646 E-4 = 0.4253

Cat 3: $(9.20/5)^{1.3}$ (3.105 E-4) = 6.861 E-4 lb/ton
Factor = 6.861 E-4/7.646 E-4 = 0.8974

Cat 4: $(14.95/5)^{1.3}$ (3.105 E-4) = 1.290 E-3 lb/ton
Factor = 1.290 E-3/7.646 E-4 = 1.687

Cat 5: $(21.28/5)^{1.3}$ (3.105 E-4) = 2.041 E-3 lb/ton
Factor = 2.041 E-3/7.646 E-4 = 2.669

Cat 6: $(27.74/5)^{1.3}$ (3.105 E-4) = 2.881 E-3 lb/ton
Factor = 2.881 E-3/7.646 E-4 = 3.768

Table 5. CRITERIA POLLUTANT EMISSIONS RATES USED FOR MODELING ANALYSES			
		Emissions Rates (lb/hr)	
Emissions Point	Stack ID	PM_{10}	Lead
Railroad silo baghouse or portable conveyor baghouse	CCONV	0.02755	8.831E-7
Cement and supplement delivery to north silo (260 yrd plant)	NSILOBH	0.02273	1.877E-6
Cement and supplement delivery to mid silo (260 yrd plant)	MSILOBH	0.02273	1.877E-6
Cement and supplement delivery to south silo (260 yrd plant)	SSILOBH	0.02273	1.877E-6
Central mix batching (260 yrd plant central dust collector)	CDCBH	0.3519	2.684E-6
Weigh hopper loading baghouse (260 yrd plant)	WHBH	0.0009764	
Cement & supplement delivery to silo (70 yrd plant)	TMSILOBH	0.01836	1.516E-6
Aggregate and sand delivery to ground storage	AGGSTOR	0.3098[a]	
Aggregate and sand transfer to conveyor (260 yrd plant)	CMCONV	0.2441[a]	
Aggregate and sand transfer to conveyor (70 yrd plant)	TMCONV	0.06572[a]	
Aggregate and sand transfer to elevated bin (250 yrd plant)	CMBIN	0.2441[a]	
Aggregate and sand transfer to elevated bin (70 yrd plant)	TMBIN	0.06572[a]	
Weigh hopper loading (70 yrd plant)	TMWH	0.06572[a]	
Truck loading (70 yrd plant)	TMLD	0.01579	3.573E-6

[a]Emissions for a base case of 10 mph wind. Emissions are varied in the model as a function of windspeed

3.2.2 TAP Emissions Rates

TAP emissions regulations under Idaho Air Rules Section 220 are only applicable for new or modified sources constructed before July 1, 1995. Table 6 provides modeled TAP emissions for those TAPs having an emissions increase that exceeded the Screening Emissions Levels (ELs) of Idaho Air Rules Section 585 and 586.

Table 6. TAPS EMISSIONS RATES USED FOR MODELING ANALYSES				
		Emissions Rates (lb/hr)		
Emissions Point	Stack ID	Arsenic	Cr(VI)	Nickel
Railroad silo baghouse or portable conveyor baghouse	CCONV	3.435E-8	4.699E-7	3.386E-6
Cement and supplement delivery to north silo (260 yrd plant)	NSILOBH	3.172E-6	1.281E-6	8.102E-6
Cement and supplement delivery to mid silo (260 yrd plant)	MSILOBH	3.172E-6	1.281E-6	8.102E-6
Cement and supplement delivery to south silo (260 yrd plant)	SSILOBH	3.172E-6	1.281E-6	8.102E-6
Central mix batching (260 yrd plant central dust collector)	CDCBH	1.371E-6	1.983E-6	1.818E-5
Weigh hopper loading baghouse (260 yrd plant)	WHBH			
Cement & supplement delivery to silo (70 yrd plant)	TMSILOBH	2.562E-6	1.035E-6	6.544E-6
Aggregate and sand delivery to ground storage	AGGSTOR			
Aggregate and sand transfer to conveyor (260 yrd plant)	CMCONV			
Aggregate and sand transfer to conveyor (70 yrd plant)	TMCONV			
Aggregate and sand transfer to elevated bin (250 yrd plant)	CMBIN			
Aggregate and sand transfer to elevated bin (70 yrd plant)	TMBIN			
Weigh hopper loading (70 yrd plant)	TMWH			
Truck loading (70 yrd plant)	TMLD	3.000E-6	2.397E-6	1.175E-5

3.3 Emission Release Parameters

Table 7 provides emissions release parameters used in the modeling analyses, including stack height, stack diameter, exhaust temperature, and exhaust velocity. All parameters appear to be within reasonably expected ranges, considering the type of sources.

Table 7. EMISSIONS RELEASE PARAMETERS					
Release Point /Location	*Source Type*	*Stack Height (m)*[a]	*Modeled Diameter (m)*	*Stack Gas Temp. (K)*[b]	*Stack Gas Flow Velocity (m/sec)*[c]
CCONV	Horizontal	2.7	0.23	293	6.9
NSILOBH	Rain Cap	25.6	1.12	293	0.85
MSILOBH	Rain Cap	25.6	1.12	293	0.85
SSILOBH	Rain Cap	25.6	1.12	293	0.85
CDCBH	Horizontal	7.0	0.30	293	32.3
WHBH	Rain Cap	12.3	0.13	293	5.1
TMSILOBH	Rain Cap	7.6	0.61	293	0.78
Volume Sources					
Release Point /Location	*Source Type*	**Release Height (m)**	**Initial Horizontal Dispersion Coefficient σ_{y0} (m)**	**Initial Vertical Dispersion Coefficient σ_{z0} (m)**	
AGGSTOR	Volume	2.0	16.3	1.06	
CMCONV	Volume	2.0	0.85	0.85	
TMCONV	Volume	3.7	0.85	0.85	
CMBIN	Volume	4.9	4.61	4.54	
TMBIN	Volume	4.3	2.98	3.97	
TMWH	Volume	4.3	2.98	3.97	
TMLD	Volume	4.3	2.98	3.97	

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

3.4 Results for Significant and Cumulative NAAQS Impact Analyses

The submitted application indicated that results for the significant impact analyses exceeded significant contribution levels, thereby requiring a cumulative impact analysis to demonstrate compliance. DEQ did not verify the results of the significant impact analyses. Results of the cumulative NAAQS impact analyses are provided in Table 8.

Table 8. RESULTS FOR CUMULATIVE IMPACT ANALYSES						
Pollutant	**Averaging Period**	**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	33.2[d]	73	106.2	150	71
	annual	9.9[e]	26	35.9	50	72
Lead	quarterly	0.000485	0.03	0.030	1.5	2

[a] Micrograms per cubic
[b] National ambient air quality standards
[c] Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers
[d] Modeled design value is the maximum 6th highest modeled value from a 5-year meteorological data set
[e] Modeled design value is the maximum of the highest modeled values from five 1-year meteorological data sets, modeled separately

3.5 Results for TAPs Analyses

Spidell performed TAPs impact analyses to evaluate compliance with applicable increments for those TAPs having emissions above screening levels of Idaho Air Rules Section 585 and 586. Results of the TAPs impact analyses are provided in Table 9.

Table 9. RESULTS FOR TAP IMPACT ANALYSES

Pollutant	Averaging Period	Modeled Impact ($\mu g/m^3$)[a]	AAC/AACC[b] ($\mu g/m^3$)
Arsenic	Annual	0.0001	0.00023
Chromium (VI)	Annual	0.00007	0.000083
Nickel	Annual	0.00049	0.0042

[a]Micrograms per cubic meter.
[b]Defined in Idaho Air Rules Section 585 and 586

4.0 CONCLUSIONS

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