Statement of Basis

Permit to Construct
Operating Permit No. P-2011.0041
Project No. 60755

POE Asphalt Paving, Inc.
Post Falls, Idaho

Facility ID No. 777-00057

Final

CZ

March 18, 2011
Carole Zundel
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

AAC	acceptable ambient concentrations
AACC	acceptable ambient concentrations for carcinogens
CO	carbon monoxide
DEQ	Department of Environmental Quality
EL	screening emission levels
EPA	U.S. Environmental Protection Agency
gr/dscf	grains (1 lb = 7,000 grains) per dry standard cubic foot
HAP	hazardous air pollutants
HMA	hot mix asphalt
IDAPA	a numbering designation for all administrative rules in Idaho promulgated in accordance with the Idaho Administrative Procedures Act
lb/hr	pounds per hour
MACT	Maximum Achievable Control Technology
mg/dscm	milligrams per dry standard cubic meter
MMBtu/hr	million British thermal units per hour
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
O&M	operation and maintenance
PM	particulate matter
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
RAP	recycled asphalt pavement
Rules	Rules for the Control of Air Pollution in Idaho
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
UTM	Universal Transverse Mercator
VOC	volatile organic compounds

FACILITY INFORMATION

Description

Heated asphalt oil is fed into the drum mixer where it mixes with the raw aggregate and recycled asphalt concrete. The product is then conveyed to storage bins. From the bins, the product is then transferred to trucks which transport the material offsite.

Power for the process will be provided by line power.

Permitting History

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 Permit status is noted as active and in effect (A) or superseded (S).

June 18, 1991	Permit number 777-00057, Hot mix asphalt plant, Permit status (A, but will become S upon issuance of this permit)

Application Scope

This PTC is for a minor modification at an existing minor facility.

The applicant has proposed to obtain a permit to construct for the installation and operation of a double barrel aggregate dryer/drum mixer at the hot mix asphalt plant in accordance with Notice to Comply No. 00305.

Application Chronology

June 7, 2010	DEQ sent a notice comply to the facility, which included notification that a PTC was required (Notice to Comply No. 00305).
January 5, 2010	DEQ received an application and an application fee.
January 25 - February 9, 2011	DEQ provided an opportunity to request a public comment period on the application and proposed permitting action.
February 2, 2011	DEQ determined that the application was complete.
February 11, 2011	DEQ made available the draft permit and statement of basis for peer and regional office review.
February 25, 2011	DEQ made available the draft permit and statement of basis for applicant review.
March 4, 2011	DEQ received comments from the applicant.
March 11, 2011	DEQ received the permit processing fee.

TECHNICAL ANALYSIS

Emissions Units and Control Devices

Table 1 EMISSIONS UNIT AND CONTROL DEVICE INFORMATION

Source Description	Control Equipment Description
Hot mix asphalt plant Manufacturer: Astec Model: RDB-9640 Type: Drum mix Max. hourly production: 500 tons per hour Burner fuel type: Natural gas Burner heat input: 103.5 MMBtu/hr Max RAP usage: 60%	Baghouse Manufacturer: CMI Model: APM 1080
Asphalt tank heater Make/Model: Powerflame C1-0 Fuel type: No. 2 non-road low sulfur fuel oil Rating: 0.6 MMBtu/hr	None

Emissions Inventories

An emission inventory was developed for the hot mix asphalt plant (see Appendix A). Emissions estimates of criteria pollutant PTE were based on emission factors from AP-42 and process information specific to the facility for this proposed project.

Emission factors for a diesel generator were included in the application, but there is no other mention of a generator in the application, and no emissions were estimated for a generator, so this permit does not allow the operation of any generator on the site.

Potential to Emit

The following table presents the potential to emit for all criteria pollutants from all emissions units at the facility as submitted by the Applicant and verified by DEQ staff. See Appendix A for a detailed presentation of the calculations of these emissions for each emissions unit.

Table 2 POTENTIAL TO EMIT FOR CRITERIA POLLUTANTS, POINT SOURCES

Emissions Unit	PM_{10}		SO_2		NO_X		CO		VOC		Lead	
	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]	lb/hr	T/yr
Hot mix asphalt plant	11.5	2.88	1.7	0.425	13.00	3.25	65.00	16.25	16.00	4.00	0.0075	0.0019
Tank heater	0.0099	0.0025	0.30	0.076	0.086	0.021	0.021	0.0054	0.0002	0.0006	0	0
Totals	11.51	2.88	2.00	0.50	13.09	3.27	65.02	16.26	16.00	4.00	0.01	0.00

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.

This facility has uncontrolled potential to emit for PM_{10} emissions greater than the Major Source threshold of 100 T/yr and a controlled potential to emit for PM_{10} emissions less than the Major Source threshold of 100 T/yr. Therefore, this facility is designated as a Synthetic Minor facility. As demonstrated in Table 2, the facility's PTE for all criteria pollutants is less than 80% of the Major Source thresholds of 100 T/yr. Therefore, this facility will not be designated as a SM-80 facility.

A summary of the estimated emissions increase of toxic air pollutants (TAP) is provided in Appendix A. The estimated emissions increases of most of the TAP were below applicable emissions screening levels (EL).

Modeling was required for Benzene, Formaldehyde, Polycyclic Organic Matter (POM), Arsenic, Cadmium, Chromium VI, Nickel, and Phosphorus because the screening EL identified in IDAPA 58.01.01.586 were exceeded.

Ambient Air Quality Impact Analyses

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 TAPs is provided in Appendix B.

An ambient air quality impact analyses 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).

REGULATORY ANALYSIS

Attainment Designation (40 CFR 81.313)

The facility is located in Kootenai 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.

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 to the facility for the modified emissions source as required by DEQ Notice to Comply No. 00305 . Therefore, a permit to construct is 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 58.01.01.625 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 assessed by Permit Conditions 10 and 11.

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 PM_{10}, SO_2, NO_X, CO, or VOC, or 10 tons per year for any one HAP or 25 tons per year for all HAPs combined as demonstrated previously in the Emissions Inventories Section of this analysis. Therefore, the facility is not a Tier I source in accordance with IDAPA 58.01.01.006.113 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 subject to 40 CFR 60 Subparts A and I. Authority has been delegated to DEQ by EPA to implement and enforce these Subparts as of July 11, 2007 and for the purposes of these subparts "Administrator" includes "DEQ."

Subpart A

40 CFR 60, Subpart A	General Provisions
40 CFR 60.1	Applicability

In accordance with 40 CFR 60.1(a), the provisions of this part apply to the owner or operator of any stationary source which contains an affected facility, the construction or modification of which is commenced after the date of publication in this part of any standard.

Subpart I

40 CFR 60, Subpart I	Standards of Performance for Hot Mix Asphalt Facilities
40 CFR 60.90	Applicability and designation of affected facility

In accordance with §60.90(a), each hot mix asphalt facility that commences construction or modification after June 11, 1973 is an affected facility and is subject to the requirements of 40 CFR 60 Subpart I.

An affected facility subject to this subpart includes the following: a drum mixer; systems for screening, handling, storing, and weighing hot aggregate; systems for loading, transferring, and storing mineral filler; systems for mixing hot mix asphalt; and the loading, transfer, and storage systems associated with emission control systems.

This HMA plant was constructed in 1984, which is after June 11, 1973. Therefore, it is an affected facility.

§ 60.92 Standard for particulate matter.

(a) On and after the date on which the performance test required to be conducted by §60.8 is completed, no owner or operator subject to the provisions of this subpart shall discharge or cause the discharge into the atmosphere from any affected facility any gases which:

(1) Contain particulate matter in excess of 90 mg/dscm (0.04 gr/dscf).

(2) Exhibit 20 percent opacity, or greater.

These requirements were written as permit conditions in the permit.

Subpart Kb

40 CFR 60, Subpart Kb Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for which Construction, Reconstruction, or Modification Commenced after July 23, 1984

Applicability Summary:

The application did not include any tanks to which this regulation would be applicable. Specifically, the applicant will not have onsite tanks that would trigger Subpart Kb. This means that:

The capacity of any tank storing fuel oil at this facility shall be less than 39,890 gallons.

The capacity of any tank storing gaseous fuels shall be less than 19,813 gallons, or the tank must be designed to operate in excess of 29.7 psi and without emissions to the atmosphere.

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 standards in 40 CFR Part 63.

Permit Conditions Review

This section describes the permit conditions that have been added, revised, modified or deleted as a result of this permitting action. All of the permit conditions have been renumbered or replaced.

On the front page of the permit, the UTM coordinates have been updated to indicate the current location.

Revised Permit Condition 1.1

This permit condition describes the process and was renumbered, and a description of the power source was added (line power).

Existing Permit Condition 1.2

Emissions from the drum mix asphalt plant are controlled by a CMI Model RAJ-18P1666 baghouse. Pressure drop across the baghouse shall conform to the requirements of section 3.3 of this permit.

Revised Permit Condition 1.2

The control equipment description is in a table. The pressure drop requirement has been replaced by visible emissions observations.

Removed Permit Condition 1.3

The stack specifications are not included in current permits, so this permit condition was removed.

Existing Permit Condition 2.1

Limits on pollutant emission rates for criteria pollutants.

Revised Permit Condition 2.1

The current emission estimates for the new equipment is based on AP-42 emission factors. PM_{10} has estimated emissions that are closest to the NAAQS (National Ambient Air Quality Standards), so PM_{10} is the limiting pollutant. Other pollutants are inherently controlled.

Revised Permit Condition 2.2

The fugitive emission limitation has been updated to quote the current regulation.

Revised Permit Condition 3.1

The maximum hourly throughput limit has been changed from 600 tons per hour to 500 tons per hour.

Removed Permit Condition 3.2

This specifies requirements for operation in non-attainment areas, which is applicable to portable units. This unit is not portable and is not being permitting as such. Therefore, this permit condition has been removed.

Removed Permit Condition 3.3

This permit condition requires monitoring of the pressure drop across the baghouse, which has been replaced by monitoring of the visible emissions.

Revised Permit Condition 4.1

This permit condition requires initial source testing, which should have been done already because the equipment is existing. A performance testing section has been written in the revised permit to address future testing requirements.

Revised Permit Condition 4.2

The maximum hour production rate monitoring requirement was replaced by hourly, daily, and annual recordkeeping requirements. The limits are set for PM_{10} NAAQS compliance, which is a 24-hour and annual standard, so tracking is required to demonstrate compliance with that.

Revised Permit Condition 4.3 and 4.4

These are requirements for pressure drop, which has been replaced by visible emissions monitoring.

Updated Permit Condition 5.1

This is for reporting test data, which has been replaced by reporting requirements for future testing and is not limited to only the initial testing that should have been done.

Removed Permit Conditions 5.1 and 5.2

These are for relocation of the source, which is now being permitted as a stationary source, so these permit conditions are no longer needed.

Appendix A is a summary of emissions limits, which have been replaced, as described earlier. The general provisions have been updated to the current form, which incorporates the current version of the IDAPA rules.

Initial Permit Condition 6

The emission estimates were made using natural gas use in the HMA, so the fuel is limited to that. Another fuel could end up with modeled exceedances of the NAAQS.

Initial Permit Condition 7

The application stated that the asphalt tank heater was using only non-road distillate fuel oil, so the analysis is based on that, and a permit condition was written limiting the fuel in the asphalt tank heater to non-road distillate fuel oil only.

Initial Permit Condition 8

This permit condition is based on IDAPA rules, and those rules apply even though it may be less restrictive than the preceding permit condition limitation, which is based on the application, of non-road distillate fuel.

Initial Permit Condition 9

This permit condition requires verification of the fuel specifications as required by previous permit conditions.

Initial Permit Condition 10

IDAPA 58.01.01.625 applies and is incorporated into this permit condition.

Initial Permit Condition 11

This requires a see/no see evaluation of the visible emissions. If visible emissions are seen, then corrective actions are required in Permit Condition 36 (Baghouse O&M Manual requirement), and either corrective action or a Method 9 test is required by Permit Condition 11. Because the see/no see is one of the methods of monitoring compliance with the PM_{10} limit, corrective action is required for the baghouse (O&M manual requirement), even if the 20% opacity limit is not exceeded.

Initial Permit Condition 12

This permit condition incorporates the requirements from IDAPA 58.01.01.650 and 651.

Initial Permit Condition 13

This permit condition identifies two areas on the facility that need special attention for fugitive emissions control.

Initial Permit Condition 14

This requires monitoring and recordkeeping of any fugitive emissions controls used, and requires the facility to look for fugitive emission problems.

Initial Permit Condition 15

This incorporates the general rule about odors.

Initial Permit Condition 16

Tracking for odor complaints and required response.

Initial Permit Condition 17

Open burning rule from IDAPA.

Initial Permit Condition 18

General documentation requirement.

Initial Permit Condition 19

Specifies test methods for the testing required in this permit.

Initial Permit Condition 20

Other requirements when conducting tests.

Initial Permit Condition 21

Summary of CFR general provisions.

Initial Permit Condition 22

Statement about incorporation by reference of federal requirements in this permit.

Initial Permit Condition 23

Statement that federal requirements apply even if this permit did not incorporate the applicable parts of the federal rule completely.

Initial Permit Condition 24

This table shows that a baghouse is required to control emissions from the asphalt plant, and that no controls are required for the asphalt tank heater.

Initial Permit Condition 25

Subpart I requirements.

Initial Permit Condition 26

This limit was written because the particulate emissions levels are close to the NAAQS standards, so a limit is needed and testing is required to assess whether the emissions exceed the limit, and potentially exceed the NAAQS.

Initial Permit Condition 27

This limits the type and percentage of materials to what was used in the permit analysis to estimate emissions. Other materials could result in higher emissions that would need to be assessed to determine if they caused higher emissions.

Initial Permit Condition 28

This specifies that the particulate emissions from the baghouse must be collected and routed back into the process (versus emitted into the air).

Initial Permit Condition 29

This limits the HMA production to what was used in the permit analysis that showed compliance with the NAAQS.

Initial Permit Condition 30

This requires monitoring of the RAP and HMA to be used to determine the percentage of RAP to assess compliance with the RAP percentage limit.

Initial Permit Condition 31

Contains details about recordkeeping to be used to assess compliance with the HMA limits.

Initial Permit Condition 32

Testing is required for PM, PM_{10}, and opacity to assess compliance with the Subpart I and PM, PM_{10}, and opacity permit limits. Retesting is required every five years in this permit, so, because this is an existing source that has been operating, if it has been more than five years since the last test, a test is required within 180 days of issuance of this permit, for the first test only. From then on, testing is required every five years. This permit condition was written to allow the facility time to prepare for a test if it has been more than five years. Otherwise, the facility could be in immediate non-compliance with the next permit condition.

Initial Permit Condition 33

This requires testing every five years.

Initial Permit Condition 34

The information required to be tracked during testing is used to assess whether the test was done at "worst case normal." The percentage of RAP may be a factor in worst case normal.

Initial Permit Condition 35

Reporting requirements about how and where to submit results of testing.

Initial Permit Condition 36

A baghouse O&M manual is required to be written to help ensure that the baghouse is properly maintained and operated for adequate particulate control. Also, the O&M must contain a description of the procedures that will be used to "fix" the baghouse if visible emissions are seen during the routine visible emissions inspections or any time that visible emissions happen to be seen. Visible emissions are being used as an indicator that the particulate levels might be exceeded.

Initial Permit Condition 37

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

Initial Permit Condition 38

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

Initial Permit Condition 39

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

Initial Permit Condition 40

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

Initial Permit Condition 41

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

Initial Permit Condition 42

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

Initial Permit Condition 43

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

Initial Permit Condition 44

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

Initial Permit Condition 45

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

Initial Permit Condition 46

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

Initial Permit Condition 47

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

Initial Permit Condition 48

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

Initial Permit Condition 49

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

Initial Permit Condition 50

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

Initial Permit Condition 51

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

PUBLIC REVIEW

Public Comment Opportunity

An opportunity for public comment period on the application was provided in accordance with IDAPA 58.01.01.209.01.c or IDAPA 58.01.01.404.01.c. During this time, there were no comments on the application and there was not a request for a public comment period on DEQ's proposed action. Refer to the chronology for public comment opportunity dates.

APPENDIX A – EMISSIONS INVENTORIES

Emission Factors
POE Asphalt Paving, Inc.
#1800 Hot Mix Asphalt Plant
Post Falls, Idaho

HOT-MIX ASPHALT PLANT DRUM DRYER EMISSION FACTORS

CASRN	Pollutant	Emission Factor Nat Gas (lb/ton)
	PM (total)	0.033
	PM-10 (total)	0.023
	P.M.-2.5	0.0029
630-08-0	CO	0.13
10102-44-0	NOx	0.026
7446-09-5	SO_2	0.0034
74-98-6	VOC	0.032
7439-92-1	Lead	1.50E-05
124-38-9	CO_2	33.00
Non-PAH HAPs		
71-43-2	Benzene	3.90E-04
100-41-4	Ethylbenzene	2.40E-04
50-00-0	Formaldehyde	3.10E-03
110-54-3	Hexane	9.20E-04
540-84-1	Isooctan	4.00E-05
71-55-6	Methyl chloroform	4.80E-05
108-88-3	Toluene	1.50E-04
1330-20-7	Xylene	2.00E-04
PAH HAPs		
91-57-6	2-Methylnaphthalene	7.40E-05
83-32-9	Acenaphthene	1.40E-06
208-96-8	Acenaphthylene	8.60E-06
120-12-7	Anthracene	2.20E-07
56-55-3	Benzo(a)anthracene	2.10E-07
50-32-8	Benzo(a)pyrene	9.80E-09
205-99-2	Benzo(b)fluoranthene	1.00E-07
192-97-2	Benzo(e)pyrene	1.10E-07
191-24-2	Benzo(g,h,I)perylene	4.00E-08
207-08-9	Benzo(k)fluoranthene	4.10E-08
218-01-9	Chrysene	1.80E-07
206-44-0	Fluoranthene	6.10E-07
86-73-7	Fluorene	3.80E-06
193-39-5	Indeno(1,2,3-cd)pyrene	7.00E-09
91-20-3	Naphthalene	9.00E-05
198-55-0	Perylene	8.80E-09
85-01-8	Phenanthrene	7.60E-06
129-00-0	Pyrene	5.40E-07

CASRN	Pollutant	Emission Factor Nat Gas (lb/ton)
Non-HAP Organic Compounds		
106-97-8	Butane	6.70E-04
74-85-1	Ethylene	7.00E-03
142-82-5	Heptane	9.40E-03
763-29-1	2-Methyl-1-pentene	4.00E-03
513-35-9	2-Methyl-2-butene	5.80E-04
96-14-0	3-Methylpentane	1.90E-04
109-67-1	1-Pentene	2.20E-03
109-66-0	n-Pentane	2.10E-04
Metals		
7440-36-0	Antimony	1.80E-07
7440-38-2	Arsenic	5.60E-07
7440-39-3	Barium	5.80E-06
7440-43-9	Cadmium	4.10E-07
7440-47-3	Chromium	5.50E-06
7440-48-4	Cobalt	2.60E-08
7440-50-8	Copper	3.10E-06
18540-29-9	Hexavalent Chromium	4.50E-07
7439-96-5	Manganese	7.70E-06
7439-97-6	Mercury	2.60E-06
7440-02-0	Nickel	6.30E-05
7723-14-0	Phosphorus	2.80E-05
7440-22-4	Silver	4.80E-07
7782-49-2	Selenium	3.50E-07
7440-28-0	Thallium	4.10E-09
7440-66-6	Zinc	6.10E-05

Emission factors are from AP-42 11.1, Hot Mix Asphalt Plants, 3/04
Natural gas fired dryer with fabric filter.

Emission Factors
POE Asphalt Paving, Inc.
#1800 Hot Mix Asphalt Plant
Post Falls, Idaho

EMISSION FACTORS FOR ASPHALT TANK #2 FUEL OIL

CASRN	Pollutant	Emission Factor #2 Fuel Oil (lb/gal)
	PM (total) [b]	0.00330
	PM-10 (total) [b]	0.00230
	P.M.-2.5	0.00155
630-08-0	CO [b]	0.005
10102-44-0	NOx [b]	0.02
7446-09-5	SO_2 [b]	0.071
74-98-6	VOC [d] (TOC EF)	5.56E-04
7439-92-1	Lead [f]	1.26E-06
124-38-9	CO_2	22.30
Non-PAH HAPs		
71-43-2	Benzene	2.14E-07
100-41-4	Ethylbenzene	6.36E-08
50-00-0	Formaldehyde [c,e]	3.50E-06
71-55-6	Methyl chloroform	2.36E-07
108-88-3	Toluene	6.20E-06
1330-20-7	Xylene	1.09E-07
PAH HAPs		
83-32-9	Acenaphthene [c]	5.30E-07
208-96-8	Acenaphthylene [c]	2.00E-07
120-12-7	Anthracene [c]	1.80E-07
56-55-3	Benzo(a)anthracene	4.01E-09
205-99-2	Benzo(b)fluoranthene [c]	1.00E-07
191-24-2	Benzo(g,h,I)perylene	2.26E-09
218-01-9	Chrysene	2.38E-09
25321-22-6	Dibenzo(a,h)anthracene	1.67E-09
206-44-0	Fluoranthene [c]	4.40E-08
86-73-7	Fluorene [c]	3.20E-08
193-39-5	Indeno(1,2,3-cd)pyrene	2.14E-09
91-20-3	Naphthalene [c,e]	1.70E-05
85-01-8	Phenanthrene [c]	4.90E-06
129-00-0	Pyrene [c]	3.20E-08

CASRN	Pollutant	Emission Factor #2 Fuel Oil (lb/gal)
Metals		
7440-36-0	Antimony [c]	5.25E-06
7440-38-2	Arsenic [c]	5.60E-07
7440-39-3	Barium [c]	2.57E-06
7440-41-7	Beryllium [c]	4.20E-07
7440-43-9	Cadmium [c]	4.20E-07
7440-47-3	Chromium [c]	4.20E-07
7440-48-4	Cobalt [c]	6.02E-06
7440-50-8	Copper [c]	8.40E-07
18540-29-9	Hexavalent Chromium [c]	2.48E-07
7439-96-5	Manganese [c]	8.40E-07
7439-97-6	Mercury [c]	4.20E-07
7439-98-7	Molybdenum [c]	7.87E-07
7440-02-0	Nickel [c]	4.20E-07
7723-14-0	Phosphorus [c]	9.46E-06
7782-49-2	Selenium [c]	2.10E-06
7440-62-2	Vanadium [c]	3.18E-05
7440-66-6	Zinc [c]	5.60E-07
Dioxins		
39227-28-6	1,2,3,4,7,8-HxCDD [c]	6.90E-13
19408-74-3	1,2,3,7,8,9-HxCDD [c]	7.60E-13
35822-46-9	1,2,3,4,6,7,8-Hp-CDD [c]	1.50E-11
	Total HpCDD [c]	2.00E-11
3268-87-9	Octa CDD [c]	1.60E-10
	Total PCDD [c]	2.00E-10
Furans		
	Total TCDF [c]	3.30E-12
	Total PeCDF [c]	4.80E-13
	Total HxCDF [c]	2.00E-12
	Total HpCDF [c]	9.70E-12
67562-39-4	1,2,3,4,6,7,8-HpCDF	3.50E-12
39001-02-0	Octa CDF [c]	1.20E-11
	Total PCDF [c]	3.10E-11
	Total PCDD/PCDF [c]	2.30E-10

a) Emission factors for criteria pollutants are from AP-42, 1.3, Fuel Oil Combustion, 9/98; all other factors are from AP-42 11.1, Hot Mix Asphalt Plants, 3/04
b) AP-42, Table 1.3-1, Criteria Pollutant Emission Factors for Fuel Oil Combustion, 9/98, Boilers < 100 MMBtu, SOx based on max fuel sulfur content of 0.5%
c) AP-42, Table 11.1-13, Emission Factors for Hot Mix Asphalt Hot Oil Systems, 3/04
d) AP-42, Table 1.3-3, Emission Factors for Total Organic Compounds (TOC), Methane, and Nonmethane TOC (NMTOC) from Uncontrolled Fuel Oil Combustion; Comm Boiler
e) IDAPA Toxic Air Pollutant
f) AP-42, Table 1.3-10 and 1.3-11, Emission Factors for Metals from Uncontrolled No. 6 Fuel Oil Combustion

Emission Factors
POE Asphalt Paving, Inc.
#1800 Hot Mix Asphalt Plant
Post Falls, Idaho

FUGITIVE EMISSION FACTORS FOR LOAD-OUT, SILO FILLING, AND ASPHALT STORAGE

	Asphalt Volatility (V)	-0.5	
	HMA Mix Temp (°F)	325	
Emission Source	**Pollutant**	**Predictive Emission Equation**	**Emission Factor (lb/ton)**
Plant Load-out	Total PM	$EF = 0.000181 + 0.00141(-V)e^{((0.0251)(T + 460) - 20.43)} =$	5.219E-04
	Organic PM	$EF = 0.00141(-V)e^{((0.0251)(T + 460) - 20.43)} =$	3.409E-04
	TOC	$EF = 0.0172(-V)e^{((0.0251)(T + 460) - 20.43)} =$	4.159E-03
	CO	$EF = 0.00558(-V)e^{((0.0251)(T + 460) - 20.43)} =$	1.349E-03
Silo Filling	Total PM	$EF = 0.000332 + 0.00105(-V)e^{((0.0251)(T + 460) - 20.43)} =$	5.859E-04
	Organic PM	$EF = 0.00105(-V)e^{((0.0251)(T + 460) - 20.43)} =$	2.539E-04
	TOC	$EF = 0.0504(-V)e^{((0.0251)(T + 460) - 20.43)} =$	1.219E-02
	CO	$EF = 0.00488(-V)e^{((0.0251)(T + 460) - 20.43)} =$	1.180E-03

		Organic Particulate/ Organic Volatile		Emission Factor		
CASRN		Load-out (%)	Silo Filling (%)	Load-out lb/ton	Silo Filling lb/ton	Total lb/ton
	PM (total)			5.219E-04	5.859E-04	1.108E-03
	PM-10 (total)			5.219E-04	5.859E-04	1.108E-03
	P.M.-2.5			5.219E-04	5.859E-04	1.108E-03
630-08-0	CO			1.349E-03	1.180E-03	2.529E-03
74-98-6	VOC	94	100	3.909E-03	1.219E-02	1.610E-02
Non-PAH HAPs						
71-43-2	Benzene	0.052	0.032	2.163E-06	3.900E-06	6.06239E-06
74-83-9	Bromomethane	0.0096	0.0049	3.993E-07	5.971E-07	9.96407E-07
75-15-0	Carbon disulfide	0.013	0.016	5.407E-07	1.950E-06	2.49053E-06
75-00-3	Chloroethane (Ethyl chloride)	0.00021	0.004	8.734E-09	4.875E-07	4.96201E-07
74-87-3	Chloromethane (Methyl chloride)	0.015	0.023	6.238E-07	2.803E-06	3.42678E-06
92-82-8	Cumene	0.11	0	4.575E-06	0.000E+00	4.57484E-06
100-41-4	Ethylbenzene	0.28	0.038	1.165E-05	4.631E-06	1.6276E-05
500-00-0	Formaldehyde	0.088	0.69	3.660E-06	8.409E-05	8.7748E-05
110-54-3	Hexane	0.15	0.1	6.238E-06	1.219E-05	1.84251E-05
54-84-1	Isooctan	0.0018	0.00031	7.486E-08	3.778E-08	1.1264E-07
75-09-2	Methylene chloride (Dichloromethane)	0	0.00027	0.000E+00	3.290E-08	3.29041E-08
78-93-3	Methyl Ethyl Ketone	0.049	0.039	2.038E-06	4.753E-06	6.79069E-06
100-42-5	Styrene	0.0073	0.0054	3.036E-07	6.581E-07	9.61684E-07
127-18-4	Tetrachloroethene (Tetrachloroethylene)	0.0077	0	3.202E-07	0.000E+00	3.20239E-07
75-69-4	Trichlorofluoromethane	0.0013	0	5.407E-08	0.000E+00	5.40663E-08
100-88-3	Toluene	0.21	0.062	8.734E-06	7.556E-06	1.62895E-05
95-47-6	Xylene	0.490	0.257	2.038E-05	3.132E-05	5.170E-05
108-95-2	Phenol	1.18	0	4.023E-06	0.000E+00	4.02306E-06
PAH HAPs						
91-57-6	2-Methylnaphthalene	2.38	5.27	8.114E-06	1.338E-05	2.14943E-05
83-32-9	Acenaphthene	0.26	0.47	8.864E-07	1.193E-06	2.07972E-06
208-96-8	Acenaphthylene	0.028	0.014	9.546E-08	3.554E-08	1.31007E-07
120-1207	Anthracene	0.07	0.13	2.387E-07	3.301E-07	5.68712E-07
56-55-3	Benzo(a)anthracene	0.019	0.056	6.478E-08	1.422E-07	2.06956E-07
50-32-8	Benzo(a)pyrene	0.0023	0	7.842E-09	0.000E+00	7.84155E-09
205-99-2	Benzo(b)fluoranthene	0.0076	0	2.591E-08	0.000E+00	2.59112E-08
192-97-2	Benzo(e)pyrene	0.0078	0.0095	2.659E-08	2.412E-08	5.07126E-08
191-24-2	Benzo(g,h,I)perylene	0.0019	0	6.478E-09	0.000E+00	6.4778E-09
207-08-9	Benzo(k)fluoranthene	0.0022	0	7.501E-09	0.000E+00	7.50061E-09
218-01-9	Chrysene	0.103	0.21	3.512E-07	5.332E-07	8.84333E-07
53-70-3	Dibenzo(a,h)anthracene	0.00037	0	1.261E-09	0.000E+00	1.26147E-09
206-44-0	Fluoranthene	0.05	0.15	1.705E-07	3.808E-07	5.51302E-07
86-73-7	Fluorene	0.77	1.01	2.625E-06	2.564E-06	5.1895E-06
193-39-5	Indeno(1,2,3-cd)pyrene	0.00047	0	1.602E-09	0.000E+00	1.6024E-09
91-20-3	Naphthalene	1.25	1.82	4.262E-06	4.621E-06	8.8825E-06
198-55-0	Perylene	0.022	0.03	7.501E-08	7.617E-08	1.51173E-07
85-01-8	Phenanthrene	0.81	1.8	2.762E-06	4.570E-06	7.3316E-06
129-00-0	Pyrene	0.15	0.44	5.114E-07	1.117E-06	1.62852E-06
Non-HAP Organic Compounds						
67-64-1	Acetone	0.046	0.055	1.913E-06	6.703E-06	8.61579E-06
74-85-1	Ethylene	0.71	1.1	2.953E-05	1.341E-04	0.000163582
74-82-8	Methane	6.5	0.26	2.703E-04	3.169E-05	0.000302017

Emission factors are from AP-42 11.1, Hot Mix Asphalt Plants, 3/04

Emission Factors
POE Asphalt Paving, Inc.
#1800 Hot Mix Asphalt Plant
Post Falls, Idaho

FUGITIVE EMISSION FACTORS FOR AGGREGATE TRANSFERS AND SCREENING

Source	Emission Factor PM (lb/ton Agg.)	PM10 (lb/ton Agg.)	PM2.5 (lb/ton Agg.)
Agg. Trans to Bins	2.021E-03	7.646E-04	1.158E-04
Agg. Trans to Conv.	1.40E-04	4.60E-05	1.30E-05
Scalping Screen	2.20E-03	7.40E-04	5.00E-05
Total Agg. Trans. And Screening	4.36E-03	1.55E-03	1.79E-04

Emission factors for conveyor transfers and screening from AP-42 Table 11.19.2-2

Drop Point Emission Factor for Aggregate Transfer to bin from
Equation 1, AP-42 13.2.4 where:
Mean Wind Speed (U) = 10 mph
Moisture Content (M) = 5%
Particle Size Multiplier (k) =
TSP = 0.74
PM = TSP/0.8 = 0.925
PM10 = 0.35
PM2.5 = .053

$$EF\left(\frac{lb}{ton}\right) = (k \times 0.0032)\,\frac{\left(\frac{U}{5}\right)^{1.3}}{\left(\frac{M}{2}\right)^{1.4}}$$

Emission Estimates
POE Asphalt Paving, Inc.
#1800 Hot Mix Asphalt Plant
Post Falls, Idaho

Maximum Hourly Asphalt Production (tons/hr)	500
Maximum Annual Asphalt Production (tons/yr)	250,000
Maximum Tank Heater Input (MMBtu/hr)	0.6
Maximum Tank Heater Fuel Use (gal/hr)	4.2857
Maximum Tank Heater Fuel Use (gal/yr)	2142.86

	Emission Estimates															
	HMA		Tank Heater		Load-out		Silo Filling		Conv. Trans. (×3)		Screen		Agg. Trans. (×2)		Total	
Pollutant	(lb/hr)	(tons/yr)	(lb/hr)	(tons/yr)	(lb/hr)	(tons/yr)	(lb/hr)	(tons/yr)	(lb/hr)	(tons/yr)	(lb/hr)	(tons/yr)	(lb/hr.)	(tons/yr)	(lb/hr)	(tons/yr)
PM (total)	16.500	4.125	1.414E-02	3.536E-03	2.610E-01	6.524E-02	2.929E-01	7.324E-02	1.995E-01	4.988E-02	1.045E+00	2.613E-01	1.920E+00	4.799E-01	20.232	5.058
PM-10 (total)	11.500	2.875	9.857E-03	2.464E-03	2.610E-01	6.524E-02	2.929E-01	7.324E-02	6.555E-02	1.639E-02	3.515E-01	8.788E-02	7.264E-01	1.816E-01	13.207	3.302
P.M.-2.5	1.450	0.363	6.643E-03	1.661E-03	2.610E-01	6.524E-02	2.929E-01	7.324E-02	1.853E-02	4.631E-03	2.375E-02	5.938E-03	1.100E-01	2.750E-02	2.163	0.541
CO	65.000	16.250	2.143E-02	5.357E-03	6.746E-01	1.687E-01	5.900E-01	1.475E-01							66.286	16.572
NOx	13.000	3.250	8.571E-02	2.143E-02											13.086	3.271
SO_2	1.700	0.425	3.043E-01	7.607E-02											2.004	0.501
VOC	16.000	4.000	2.383E-03	5.957E-04	1.955	4.887E-01	6.093	1.523							24.050	6.013
Lead	7.500E-03	1.875E-03	5.400E-06	1.350E-06											7.51E-03	1.88E-03
CO_2	16,500.00	4,125.00	95.571	23.893											16,595.57	4,148.89
Non-PAH HAPs																
Benzene	1.95E-01	4.88E-02	9.171E-07	2.293E-07	1.081E-03	2.70E-04	1.950E-03	4.87E-04							1.98E-01	4.95E-02
Bromomethane					1.996E-04	4.99E-05	2.986E-04	7.46E-05							4.98E-04	1.25E-04
Carbon disulfide					2.703E-04	6.76E-05	9.749E-04	2.44E-04							1.25E-03	3.11E-04
Chloroethane (Ethyl chloride)					4.367E-06	1.09E-06	2.437E-04	6.09E-05							2.48E-04	6.20E-05
Chloromethane (Methyl chloride)					3.119E-04	7.80E-05	1.401E-03	3.50E-04							1.71E-03	4.28E-04
Cumene					2.287E-03	5.72E-04									2.29E-03	5.72E-04
Dichlorobenzene															0.00E+00	0.00E+00
Ethylbenzene	1.20E-01	3.00E-02	2.726E-07	6.814E-08	5.823E-03	1.46E-03	2.315E-03	5.79E-04							1.28E-01	3.20E-02
Formaldehyde	1.55E+00	3.88E-01	1.500E-05	3.750E-06	1.830E-03	4.57E-04	4.204E-02	1.05E-02							1.59E+00	3.98E-01
Hexane	4.60E-01	1.15E-01			3.119E-03	7.80E-04	6.093E-03	1.52E-03							4.69E-01	1.17E-01
Isooctane	2.00E-02	5.00E-03			3.743E-05	9.36E-06	1.889E-05	4.72E-06							2.01E-02	5.01E-03
Methyl chloroform	2.40E-02	6.00E-03	1.011E-06	2.529E-07											2.40E-02	6.00E-03
Methylene chloride (Dichloromethane)							1.645E-05	4.11E-06							1.65E-05	4.11E-06
Methyl Ethyl Ketone					1.019E-03	2.55E-04	2.376E-03	5.94E-04							3.40E-03	8.49E-04
Styrene					1.518E-04	3.80E-05	3.290E-04	8.23E-05							4.81E-04	1.20E-04
Tetrachloroethene (Tetrachloroethylene)					1.601E-04	4.00E-05									1.60E-04	4.00E-05
Trichlorofluoromethane					2.703E-05	6.76E-06									2.70E-05	6.76E-06
Toluene	7.50E-02	1.88E-02	2.657E-05	6.643E-06	4.367E-03	1.09E-03	3.778E-03	9.44E-04							8.32E-02	2.08E-02
Xylene	1.00E-01	2.50E-02	4.671E-07	1.168E-07	1.019E-02	2.55E-03	1.566E-02	3.91E-03							1.26E-01	3.15E-02
Phenol					2.012E-03	5.03E-04									2.01E-03	5.03E-04
PAH HAPs																
2-Methylnaphthalene	3.70E-02	9.25E-03			4.057E-03	1.01E-03	6.690E-03	1.67E-03							4.77E-02	1.19E-02
3-Methylchloranthrene															0.00E+00	0.00E+00
7,12-Dimethylbenz(a)anthracene															0.00E+00	0.00E+00
Acenaphthene	7.00E-04	1.75E-04	2.271E-06	5.679E-07	4.432E-04	1.11E-04	5.966E-04	1.49E-04							1.74E-03	4.36E-04
Acenaphthylene	4.30E-03	1.08E-03	8.571E-07	2.143E-07	4.773E-05	1.19E-05	1.777E-05	4.44E-06							4.37E-03	1.09E-03
Anthracene	1.10E-04	2.75E-05	7.714E-07	1.929E-07	1.193E-04	2.98E-05	1.650E-04	4.13E-05							3.95E-04	9.88E-05
Benzo(a)anthracene	1.05E-04	2.63E-05	1.719E-08	4.296E-09	3.239E-05	8.10E-06	7.109E-05	1.78E-05							2.08E-04	5.21E-05
Benzo(a)pyrene	4.90E-06	1.23E-06			3.921E-06	9.80E-07									8.82E-06	2.21E-06
Benzo(b)fluoranthene	5.00E-05	1.25E-05	4.286E-07	1.071E-07	1.296E-05	3.24E-06									6.34E-05	1.58E-05
Benzo(e)pyrene	5.50E-05	1.38E-05			1.330E-05	3.32E-06	1.206E-05	3.01E-06							8.04E-05	2.01E-05
Benzo(g,h,i)perylene	2.00E-05	5.00E-06	9.686E-09	2.421E-09	3.239E-06	8.10E-07									2.32E-05	5.81E-06
Benzo(k)fluoranthene	2.05E-05	5.13E-06			3.750E-06	9.38E-07									2.43E-05	6.06E-06
Chrysene	9.00E-05	2.25E-05	1.020E-08	2.550E-09	1.756E-04	4.39E-05	2.666E-04	6.66E-05							5.32E-04	1.33E-04
Dibenzo(a,h)anthracene			7.157E-09	1.789E-09	6.307E-07	1.58E-07									6.38E-07	1.59E-07
Fluoranthene	3.05E-04	7.63E-05	1.886E-07	4.714E-08	8.523E-05	2.13E-05	1.904E-04	4.76E-05							5.81E-04	1.45E-04
Fluorene	1.90E-03	4.75E-04	1.371E-07	3.429E-08	1.313E-03	3.28E-04	1.282E-03	3.21E-04							4.49E-03	1.12E-03
Indeno(1,2,3-cd)pyrene	3.50E-06	8.75E-07	9.171E-09	2.293E-09	8.012E-07	2.00E-07									4.31E-06	1.08E-06
Naphthalene	4.50E-02	1.13E-02	7.286E-05	1.821E-05	2.1309E-03	5.33E-04	2.310E-03	5.78E-04							4.95E-02	1.24E-02
Perylene	4.40E-06	1.10E-06			3.750E-05	9.38E-06	3.808E-05	9.52E-06							8.00E-05	2.00E-05
Phenanthrene	3.80E-03	9.50E-04	2.100E-05	5.250E-06	1.381E-03	3.45E-04	2.285E-03	5.71E-04							7.49E-03	1.87E-03
Pyrene	2.70E-04	6.75E-05	1.371E-07	3.429E-08	2.557E-04	6.39E-05	5.586E-04	1.40E-04							1.08E-03	2.71E-04
Polycyclic Organic Matter	2.74E-04	6.85E-05	4.723E-07	1.181E-07	2.30E-04	5.75E-05	3.38E-04	8.44E-05							8.42E-04	2.11E-04

Emission Estimates
POE Asphalt Paving, Inc.
#1800 Hot Mix Asphalt Plant
Post Falls, Idaho

	Emission Estimates																
	HMA		Tank Heater		Load-out		Silo Filling		Conv. Trans. (×3)		Screen		Agg. Trans. (×2)		Total	
Pollutant	(lb/hr)	(tons/yr)	(lb/hr)	(tons/yr)	(lb/hr)	(tons/yr)	(lb/hr)	(tons/yr)	(lb/hr)	(tons/yr)	(lb/hr)	(tons/yr)	(lb/hr.)	(tons/yr)	(lb/hr)	(tons/yr)
Non-HAP Organic Compounds																
Acetone					9.566E-04	2.39E-04	3.351E-03	8.38E-04							4.31E-03	1.08E-03
Butane	3.35E-01	8.38E-02													3.35E-01	8.38E-02
Ethane															0.00E+00	0.00E+00
Ethylene	3.500	0.875			1.476E-02	3.69E-03	6.703E-02	1.68E-02							3.58E+00	8.95E-01
Heptane	4.700	1.175													4.70E+00	1.18E+00
Methane					1.352E-01	3.38E-02	1.584E-02	3.96E-03							1.51E-01	3.78E-02
2-Methyl-1-pentene	2.000	0.500													2.00E+00	5.00E-01
2-Methyl-2-butene	2.90E-01	7.25E-02													2.90E-01	7.25E-02
3-Methylpentane	9.50E-02	2.38E-02													9.50E-02	2.38E-02
1-Pentene	1.100	2.75E-01													1.10E+00	2.75E-01
n-Pentane	1.05E-01	2.63E-02													1.05E-01	2.63E-02
Metals																
Antimony	9.00E-05	2.25E-05	2.250E-05	5.625E-06											1.13E-04	2.81E-05
Arsenic	2.80E-04	7.00E-05	2.400E-06	6.000E-07											2.824E-04	7.06E-05
Barium	2.90E-03	7.25E-04	1.101E-05	2.754E-06											2.91E-03	7.28E-04
Beryllium			1.800E-06	4.500E-07											1.80E-06	4.50E-07
Cadmium	2.05E-04	5.13E-05	1.800E-06	4.500E-07											2.07E-04	5.17E-05
Chromium	2.75E-03	6.88E-04	1.800E-06	4.500E-07											2.75E-03	6.88E-04
Cobalt	1.30E-05	3.25E-06	2.580E-05	6.450E-06											3.88E-05	9.70E-06
Copper	1.55E-03	3.88E-04	3.600E-06	9.000E-07											1.55E-03	3.88E-04
Hexavalent Chromium	2.25E-04	5.63E-05	1.063E-06	2.657E-07											2.26E-04	5.65E-05
Manganese	3.85E-03	9.63E-04	3.600E-06	9.000E-07											3.85E-03	9.63E-04
Mercury	1.30E-03	3.25E-04	1.800E-06	4.500E-07											1.30E-03	3.25E-04
Molybdenum			3.373E-06	8.432E-07											3.37E-06	8.43E-07
Nickel	3.15E-02	7.88E-03	1.800E-06	4.500E-07											3.15E-02	7.88E-03
Phosphorus	1.40E-02	3.50E-03	4.054E-05	1.014E-05											1.40E-02	3.51E-03
Silver	2.40E-04	6.00E-05													2.40E-04	6.00E-05
Selenium	1.75E-04	4.38E-05	9.000E-06	2.250E-06											1.84E-04	4.60E-05
Thallium	2.05E-06	5.13E-07													2.05E-06	5.13E-07
Vanadium			1.363E-04	3.407E-05											1.36E-04	3.41E-05
Zinc	3.05E-02	7.63E-03	2.400E-06	6.000E-07											3.05E-02	7.63E-03
Dioxins and Furans (TEF)																
1,2,3,4,7,8-HxCDD (0.1)			2.957E-12	7.393E-13											2.96E-12	7.39E-13
1,2,3,7,8,9-HxCDD (0.1)			3.257E-12	8.143E-13											3.26E-12	8.14E-13
1,2,3,4,6,7,8-Hp-CDD (0.1)			6.429E-11	1.607E-11											6.43E-11	1.61E-11
Total HpCDD			8.571E-11	2.143E-11											8.57E-11	2.14E-11
Octa CDD (0.001)			6.857E-10	1.714E-10											6.86E-10	1.71E-10
Total PCDD			8.571E-10	2.143E-10											8.57E-10	2.14E-10
Total TCDF			1.414E-11	3.536E-12											1.41E-11	3.54E-12
Total PeCDF			2.057E-12	5.143E-13											2.06E-12	5.14E-13
Total HxCDF			8.571E-12	2.143E-12											8.57E-12	2.14E-12
Total HpCDF			4.157E-11	1.039E-11											4.16E-11	1.04E-11
1,2,3,4,6,7,8-HpCDF (0.01)			1.500E-11	3.750E-12											1.50E-11	3.75E-12
Octa CDF (0.001)			5.143E-11	1.286E-11											5.14E-11	1.29E-11
Total PCDF			1.329E-10	3.321E-11											1.33E-10	3.32E-11
Total PCDD/PCDF			9.857E-10	2.464E-10											9.86E-10	2.46E-10
Total Dioxins and Furans (TEF Adjusted)			7.94E-12	1.984E-12											7.94E-12	1.98E-12

APPENDIX B – AMBIENT AIR QUALITY IMPACT ANALYSES

MEMORANDUM

DATE: March 18, 2011

TO: Carole Zundel, Air Program

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

PROJECT: P-2011.0041 PROJ60755 PTC Application for a modification to the POE Asphalt Paving, Inc. Hot Mix Asphalt Plant

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

1.0 Summary

POE Asphalt Paving, Inc. (POE) submitted a Permit to Construct (PTC) application for modifications to their hot mix asphalt (HMA) plant operated near Post Falls, Idaho. Site-specific air quality impact analyses involving atmospheric dispersion modeling of emissions associated with the HMA plant were performed by the applicant to demonstrate that the facility would not cause or significantly contribute to a violation of any ambient air quality standard (IDAPA 58.01.01.203.02 and 203.03 [Idaho Air Rules Section 203.02 and 203.03]).

Spidell and Associates Environmental Consultants (Spidell) performed site-specific air quality impact analyses to assure compliance with air quality standards for the modification of the POE HMA plant. The submitted information and analyses, in combination with DEQ's air quality analyses: 1) utilized appropriate methods and models; 2) was conducted using reasonably accurate or conservative model parameters and input data; 3) adhered to established DEQ guidelines for new source review dispersion modeling; 4) showed either a) that predicted pollutant concentrations from emissions associated with the facility were below significant impact levels (SILs) or other applicable regulatory thresholds; 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 locations outside of the property boundary. Table 1 presents key assumptions and results to be considered in the development of the permit.

Air impact analyses are required by Idaho Air Rules to be conducted according to methods outlined in 40 CFR 51, Appendix W (Guideline on Air Quality Models). Appendix W requires that facilities be modeled using emissions and operations representative of design capacity or as limited by a federally enforceable permit condition. The submitted information, in combination with DEQ's analyses, demonstrated to the satisfaction of the Department that operation of the proposed facility or modification will not cause or significantly contribute to a violation of any ambient air quality standard, provided the key conditions in Table 1 are representative of facility design capacity or operations as limited by a federally enforceable permit condition.

Table 1. KEY CONDITIONS USED IN MODELING ANALYSES	
Criteria/Assumption/Result	**Explanation/Consideration**
Maximum HMA throughput does not exceed 500 ton HMA/hour, 6,000 ton HMA/day, and 250,000 ton HMA/year.	Short-term and annual modeling was performed assuming these production rates.
Ambient impacts were assessed only for the current location of the HMA plant.	The analyses have not demonstrated compliance with NAAQS for a portable facility.
Co-contributing emissions sources such as other HMA plants, concrete batch plants, or rock crushing plants will not locate on the POE site within 1,000 feet of emissions points of the HMA, except as noted below for a rock crushing plant. However, NAAQS compliance is assured for the HMA plant with a co-contributing rock crushing plant, provided it is not operated during any day when the HMA plant is operated and the annual actual throughput of the rock crushing plant is less than 500,000 ton/year.	Emissions are considered co-contributing if they occur within 1,000 feet (305 meters) of each other.
DEQ Modeling staff contend that NAAQS compliance is assured for the HMA plant operating simultaneously (both within a given day) with a crushing plant, provided HMA daily throughput for that day is limited to half that normally allowed.	Decreased HMA throughput will offset potential impacts of a nearby crushing plant.
No diesel-fired engines powering generators will be operated at the site.	The analyses did not account for operation of any diesel-fired generators.
Fugitive emissions from material handling and vehicle traffic are controlled to a high degree.	Control of conveyor transfers and screening are equivalent to that achieved by a water spray.
Emissions rates for applicable averaging periods are not greater than those used in the modeling analyses, as listed in this memorandum.	NAAQS compliance for emissions rates greater than those listed in this memorandum have not been demonstrated.
Stack heights for the drum dryer, tank heater, and generator are as listed in this memorandum or higher.	NAAQS compliance is still assured if actual stack heights are greater than those listed in this memorandum.
NAAQS compliance is assured provided stack parameters of exhaust temperature and flow rate are not less than about 75 percent of values listed in this memorandum.	Higher temperatures and flow rates increase plume rise, allowing the plume to disperse to a larger degree before impacting ground level.

2.0 Background Information

2.1 Applicable Air Quality Impact Limits and Modeling Requirements

This section identifies applicable ambient air quality limits and analyses used to demonstrate compliance.

2.1.1 Area Classification

The HMA plant will operate as a stationary facility. Impact analyses performed do not support it operating as a portable facility The HMA plant is located in an area 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 modification exceed the significant impact levels (SILs) of Idaho Air Rules Section 006 (referred to as a significant contribution in Idaho Air Rules), then a cumulative NAAQS impact analysis is necessary to demonstrate compliance with 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 SILs and specifies the modeled value that must be used for comparison to the NAAQS.

Table 2. APPLICABLE REGULATORY LIMITS

Pollutant	Averaging Period	Significant Impact Levels[a] ($\mu g/m^3$)[b]	Regulatory Limit[c] ($\mu g/m^3$)	Modeled Value Used[d]
PM_{10}[e]	Annual[f]	1.0	50[g]	Maximum 1^{st} highest[h]
	24-hour	5.0	150[i]	Maximum 6^{th} highest[j]
$PM_{2.5}$[k]	Annual	0.3	15[l]	Use PM_{10} as surrogate
	24-hour	1.2	35[m]	Use PM_{10} as surrogate
Carbon monoxide (CO)	8-hour	500	10,000[n]	Maximum 2^{nd} highest[h]
	1-hour	2,000	40,000[n]	Maximum 2^{nd} highest[h]
Sulfur Dioxide (SO_2)	Annual	1.0	80[g]	Maximum 1^{st} highest[h]
	24-hour	5	365[n]	Maximum 2^{nd} highest[h]
	3-hour	25	1,300[n]	Maximum 2^{nd} highest[h]
	1-hour	3 ppb[o] (7.8 $\mu g/m^3$)	75 ppb[p] (196 $\mu g/m^3$)	Mean of maximum 4^{th} highest[q]
Nitrogen Dioxide (NO_2)	Annual	1.0	100[g]	Maximum 1^{st} highest[h]
	1-hour	4 ppb[o] (7.5 $\mu g/m^3$)	100 ppb[r] (188 $\mu g/m^3$)	Mean of maximum 8^{th} highest[s]
Lead (Pb)	Quarterly	NA	1.5[g]	Maximum 1^{st} highest[h]
	3-month[t]	NA	0.15[g]	Maximum 1^{st} highest[h]

a. Idaho Air Rules Section 006.
b. Micrograms per cubic meter.
c. Incorporated into Idaho Air Rules by reference, as per Idaho Air Rules Section 107.
d. The maximum 1^{st} 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. Not 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. 3-year average of annual concentration.
m. 3-year average of the upper 98^{th} percentile of 24-hour concentrations.
n. Not to be exceeded more than once per year.
o. Interim SIL established by EPA policy memorandum.
p. 3-year average of the upper 99^{th} percentile of the distribution of maximum daily 1-hour concentrations.
q. Mean (of 5 years of data) of the maximum of 4^{th} highest daily 1-hour maximum modeled concentrations for each year of meteorological data modeled.
r. 3-year average of the upper 98^{th} percentile of the distribution of maximum daily 1-hour concentrations.
s. Mean (of 5 years of data) of the maximum of 8^{th} highest daily 1-hour maximum modeled concentrations for each year of meteorological data modeled.
t. 3-month rolling average.

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 (October 23, 1997) that compliance with $PM_{2.5}$ standards will be assured through an air quality analysis for the corresponding PM_{10} standard. DEQ allows a direct surrogate use of PM_{10} modeling results and does not require the adjustments and justifications for surrogate use as suggested by the EPA March 23, 2010, Stephen Page Memo (Memorandum from Stephan Page, Director of Office of Air Quality Planning and Standards, EPA, *Modeling Procedures for Demonstrating Compliance with $PM_{2.5}$ NAAQS*, March 23, 2010). 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.

New NO_2 and SO_2 short-term standards have recently been promulgated by EPA. The standards will not be applicable for permitting purposes in Idaho until they are incorporated by reference *sine die* into Idaho Air Rules (Spring 2011).

Spidell/POE used site-specific significant impact analyses and cumulative NAAQS impact analyses to demonstrate compliance with Idaho Air Rules Section 203.02.

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

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 area surrounding the POE HMA plant.

General default 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 used in the POE site-specific analyses were based on DEQ default values for rural/agricultural areas for all pollutants except PM_{10}. Coeur d'Alene monitoring data for 2001 through

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

2005 were used to calculate background PM_{10} concentrations. The 6th highest 24-hour PM_{10} concentration in the five-year dataset was used as the background. In most instances the maximum monitored value is conservatively used as background. DEQ determined use of the 6th highest value in the dataset would be adequate since the Coeur d'Alene monitor is located in a suburban area rather than a rural area, and DEQ suspects high monitored values would be a result of suburban sources such as residential wood burning and vehicle emissions. The 6th highest value accounts for one allowed exceedance for each year. The default rural/agricultural area PM_{10} background value is 73 μg/m^3 for the 24-hour averaging period and 26 μg/m^3 for the annual averaging period. These are not substantially different from the values based on Coeur d'Alene data.

Table 3. BACKGROUND CONCENTRATIONS

Pollutant	Averaging Period	Background Concentration (μg/m^3)[a]
PM_{10}[b]	24-hour	69
	Annual	20
Carbon monoxide (CO)	1-hour	3,600
	8-hour	2,300
Sulfur dioxide (SO_2)	3-hour	34
	24-hour	26
	Annual	8
Nitrogen dioxide (NO_2)	Annual	17
Lead (Pb)	Quarterly	0.03

a. Micrograms per cubic meter.
b. Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers.

3.0 Modeling Impact Assessment

3.1 Modeling Methodology

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

3.1.1 Overview of Analyses

Spidell performed site-specific analyses to demonstrate compliance with applicable ambient air quality standards. DEQ staff performed supplemental verification analyses because of uncertainties in the methods and data used, primarily with the meteorological data selected. Results obtained by Spidell's analyses, in combination with those obtained by DEQ's verification analyses, demonstrated compliance with applicable standards to DEQ's satisfaction.

The project is a modification to allow operation of a new drum dryer. The air impact analyses performed in support of the modification were conservatively conducted as if DEQ is permitting the entire HMA plant as a new facility.

Table 4 provides a brief description of parameters used in the ambient air impact modeling analyses.

Table 4. MODELING PARAMETERS		
Parameter	**Description/Values**	**Documentation/Addition Description**[a]
General Facility Location	Post Falls	Area is attainment or unclassifiable. Universal Transverse Mercator (UTM) coordinates E 498.4 km, N 5,286.5 km
Model	AERMOD	AERMOD with the PRIME downwash algorithm, version 09292
Meteorological Data	Spokane Sandpoint	1988 through 1992 Spokane data used by Spidell's analyses 2002 through 2006 Sandpoint data used for DEQ verification analyses.
Terrain	Considered	7.5 minute DEM files were used to establish receptor elevations.
Building Downwash	Considered	An office building and asphalt storage silos were considered.
Receptor Grid	Grid 1	10-meter spacing along the property boundary out 50 meters at Southwest Corner of Property.
	Grid 2	25-meter spacing out to 100 meters.
	Grid 3	50-meter spacing out to 500 meters.
	Grid 4	100-meter spacing out to 1000 meters.

3.1.2 Modeling protocol and Methodology

A modeling protocol was submitted to DEQ prior to the application and DEQ provided conditional approval of the protocol. Site-specific modeling was generally conducted using data and methods described in the protocol and in the *State of Idaho Air Quality Modeling Guideline.*

3.1.3 Model Selection

Idaho Air Rules Section 202.02 require that estimates of ambient concentrations be based on air quality models specified in 40 CFR 51, Appendix W (Guideline on Air Quality Models). The refined, steady state, multiple source, Gaussian dispersion model AERMOD was promulgated as the replacement model for ISCST3 in December 2005. AERMOD must be used for all air impact analyses, performed in support of air quality permitting, conducted after November 2006, unless approved by DEQ in advance.

AERMOD was used for the air impact analyses to evaluate impacts of the POE HMA plant.

3.1.4 Meteorological Data

Five years of hourly meteorological data collected from Spokane International Airport were used in the submitted modeling analyses. These data were preprocessed by Spidell using the AERMET program. Meteorological data are also available for the Coeur d'Alene airport but have not been quality-assured for dispersion modeling purposes and are not readily accessible in a model-ready format. For permitting purposes, DEQ has determined that processing of such data is not a reasonable requirement for projects having emissions below significance levels (Idaho Air Rules Section 006) when other reasonably representative meteorological data are available in a model-ready format.

DEQ determined, after further assessment of the application site in relation to the location where meteorological data were collected, that Spokane meteorological data are of somewhat questionable representativeness for the application site. DEQ performed verification impact analyses using meteorological data collected from Sandpoint, Idaho, to further assure that compliance with applicable standards is assured.

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 (09040) and Digital Elevation Model (DEM) 7.5-minute files.

There are not substantial terrain variations along the property boundary where maximum impacts are modeled to occur, as verified by satellite images, complete with UTM coordinates and elevations, as observed with the Google Earth program. Google Earth is available at http://www.google.com/earth/index.html.

3.1.6 Facility Layout

DEQ checked locations specified in the model against those listed in the application, and reviewed the general location using Google Earth.

3.1.7 Building Downwash

Downwash effects caused by the office building and the two storage silos, 66.5 feet high with a 10.4 foot diameter, were accounted for in the analyses. Dimensions of the office building were 100 feet by 90 feet by 24 feet high.

Downwash effects from other structures at the site were not accounted for because much of the equipment is porous with regard to wind, thereby minimizing downwash effects.

3.1.8 Ambient Air Boundary

The property boundary was used as the boundary to ambient air. It was assumed that reasonable measures will be taken by POE to preclude public access to the site.

3.1.9 Receptor Network

The ambient air receptor network met the minimal requirements established in the *State of Idaho Air Quality Modeling Guideline*. DEQ also determined that receptor spacing used was adequate to reasonably resolve maximum modeled concentrations.

3.2 Emission Rates

Emissions rates of criteria pollutants and TAPs were calculated for the stated HMA plant production rates and operational configuration for various applicable averaging periods.

3.2.1 Criteria Pollutant Emissions Rates

Table 5 lists criteria pollutant emissions rates used in the site-specific modeling analyses for the HMA plant production rate, operational configuration, and for all applicable averaging periods.

Fugitive particulate emissions from frontend loader handling of aggregate materials for the HMA plant were designated as emissions point AGGBIN in the model. Two transfers were included for the source: 1) transfer of aggregate from truck unloading to a storage pile; 2) transfer of aggregate from the storage pile to a hopper. Emissions rates are a function of wind speed and were varied in the model according to wind speed. Attachment 1 provides details on emissions calculations.

Emissions from screening of aggregate and three conveyor transfers were combined into one source (emissions point CONV in the model). Spidell used emissions factors for controlled screening and conveyor transfers at DEQ's suggestion. Controlled emissions, based on use of water sprays, were used for screening and conveyor transfers because compliance with the 24-hour PM_{10} standard could not likely be demonstrated when using uncontrolled screening and conveyor transfer emissions.

Table 5. EMISSIONS USED IN SUBMITTED ANALYSES

Emissions Point in Model	Pollutant	Averaging Period	Emissions Rate (lb/hr) 500 ton/hr, 6,000 ton/day 250,000 ton/yr
DRYERSTK – drum dryer/mixer - emissions controlled by a baghouse	PM_{10}	24-hour	5.75
		annual	0.6564
	CO	1-hour 8-hour	65.0
	SO_2	3-hour	1.70
		24-hour	0.850
		Annual	0.0970
	NOx	annual	0.742
SILOFILL– filling of asphalt storage silo	PM_{10}	24-hour	0.1465
		annual	0.0167
	CO	1-hour 8-hour	0.5900
SILOLOUT – asphalt loadout from storage silo	PM_{10}	24-hour	0.1305
		annual	0.0149
	CO	1-hour 8-hour	0.6746
TNKHTR – asphalt oil heater	PM_{10}	24-hour	0.0049
		annual	0.0006
	CO	1-hour 8-hour	2.50
	SO_2	3-hour	0.3043
		24-hour	0.1521
		Annual	0.0174
	NOx	annual	0.0049
AGGBIN[a] – aggregate handling by frontend loader	PM_{10}	24-hour	0.3632
		annual	0.0415
CONV – conveyors, scalping screen	PM_{10}	24-hour	0.2085
		annual	0.0238

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

3.2.2 TAP Emissions Rates

Facility-wide TAP emissions were used in the modeling analyses rather than increases associated with only the modification. Modeled emissions are provided in Table 6. Table 7 is a summary of TAP emissions and a comparison to the applicable ELs.

Table 6. TAP EMISSIONS USED IN DEQ ANALYSES			
Emissions Point in Model	**Pollutant**	**Averaging Period**	**Emissions Rate for 250,000 ton HMA/yr (lb/hr)**
DRYERSTK – drum dryer/mixer - emissions controlled by a baghouse	Arsenic	period	1.598E-5
	Cadmium	period	1.170E-5
	Chromium 6+	period	1.284E-5
	Nickel	period	1.798E-3
	Phosphorus	24-hour	7.000E-3
	Benzene	period	1.113E-2
	Formaldehyde	period	8.847E-2
	PAH (naphthalene)	period	2.568E-3
	POM	period	1.563E-5
SILOFILL – filling of asphalt storage silo	Benzene	period	1.113E-4
	Formaldehyde	period	2.400E-3
	PAH(naphthalene)	period	1.319E-4
	POM	period	1.927E-5
SILOLOUT – asphalt loadout from storage silo	Benzene	period	6.172E-5
	Formaldehyde	period	1.044E-3
	PAH(naphthalene)	period	1.216E-4
	POM	period	1.313E-5
TNKHTR – asphalt tank heater	Arsenic	period	1.370E-7
	Cadmium	period	1.027E-7
	Chromium 6+	period	6.067E-8
	Nickel	period	1.027E-7
	Phosphorous	24-hour	2.027E-5
	Benzene	period	5.235E-8
	Formaldehyde	period	8.562E-7
	PAH (naphthalene)	period	4.159E-6
	POM	period	2.696E-8

Table 7. SUMMARY OF FACILITY-WIDE TAP EMISSIONS USED FOR MODELING				
TAP	**Averaging Period**	**Emissions**	**EL**	**Modeling Required**
Arsenic	period	1.612E-5	1.5E-6	Yes
Benzene	period	1.130E-2	8.0E-4	Yes
Cadmium	period	1.180E-5	3.7E-6	Yes
Chromium 6+	period	1.290E-5	5.6E-7	Yes
Formaldehyde	period	9.098E-2	5.1E-4	Yes
Nickel	period	1.798E-3	2.7E-5	Yes
PAH(naphthalene)	period	2.826E-3	9.1E-5	Yes
Phosphorous	24-hour	7.020E-3	7.0E-3	Yes
POM	period	4.806E-5	2.0E-6	Yes

Section 2.1.3 of this memorandum describes how carcinogenic TAP impacts of 10 times the AACC are allowed if the source utilizes T-RACT for controls. DEQ has determined a baghouse is T-RACT for particulate carcinogenic TAPs from the drum dryer and no additional control beyond good combustion is T-RACT for other carcinogenic TAPs. The analyses performed by Spidell conservatively did not account for T-RACT implemented on emissions sources.

3.3 Emission Release Parameters and Plant Criteria

Table 8 lists the characteristics of the POE HMA plant used in the submitted site-specific air impact analyses.

Table 8. CHARACTERISTIC OF HMA PLANT USED IN DEQ ANALYSES	
Parameter	**Value or Description**
HMA Throughput Rates	500 ton/hr, 6,000 ton/day, 250,000 ton/yr
Co-Contributing Sources	The emissions points of the HMA plant are not located within 1,000 feet of other permittable emissions sources. A rock crushing plant could be operated at the site provided it is not operated during any day when the HMA plant is operated and annual throughput is less than 500,000 ton/yr. Alternatively, a rock crusher could be operated simultaneously (both operating in a given day) with the HMA plant provided the HMA throughput for that day does not exceed a value of half that otherwise allowed.
Drum Dryer	Drum dryer fueled exclusively by natural gas with a baghouse for emissions control.
Dryer Stack Parameters	Stack height ≥8.5 m, stack diameter ≈1.6 m, gas temp ≥ 394 K, flow velocity ≥19 m/sec.
Asphalt Silo Filling	Emissions occur from a "Gob Hopper" located above the silos, at a height of 20.3 m.
Asphalt Loadout	Emissions occur from the bed of the truck loaded with asphalt.
Tank Heater	0.6 MMbtu/hr tank heater fueled by natural gas or diesel
Tank Heater Stack Parameters	Stack height ≥4.3 m, stack diameter ≈0.11 m, gas temp ≥ 450 K, flow velocity ≥8.5 m/sec.
Electrical Power	Line power
Conveyor Transfers	≤3 transfers for any given quantity of material processed. Emissions controlled to a point equivalent to use of a water spray.
Scalping Screen	≤1 screen for any given quantity of material processed. Emissions controlled to a point equivalent to use of a water spray.
Frontend Loader Transfers	≤2 transfers for any given quantity of material processed. Typically involves: 1) aggregate to storage pile; 2) aggregate from pile to hopper.

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

Asphalt silo filling and asphalt loadout were modeled by Spidell as volume sources. Documentation was provided with the application explaining how dispersion parameters were established for the source. DEQ verification analyses were performed with these sources modeled as point sources, rather than volume sources, to account for thermal buoyancy of the emissions. Release parameters for silo filling and asphalt loadout in DEQ's analyses were based on the following:

- Release point of silo filling was established as the top of the "Gob Hopper" that extends above the silo, and the release point of asphalt loadout operations was set to correspond to the top of a truck bed.
- Stack diameter of 3.0 meters was used to approximately correspond to the Gob Hopper. Model-calculated stack tip downwash will account for downwash affects potentially caused by the hopper. The silo structures were also put into the model and will be assessed for plume downwash by the model.
- Stack gas temperature of 346K was calculated by assuming the gas temperature would be half that of the default asphalt temperature of 325°F (1/2 of 325° F = 163° F = 346 K).
- Flow velocity of 0.1 m/sec was used to establish a reasonably conservative total flow from the source of 1,500 actual cubic feet per minute, caused by convection.

DEQ also adjusted the initial dispersion coefficients used for the frontend loader aggregate handling emissions sources and the combined screening and conveyor transfer sources. Spidell's analyses assumed the area where emissions occur is 30 meters by 30 meters, giving a σ_{yo} of 7.0 meters (30 meters / 4.3). DEQ's analyses used a more conservative area of 20 meters by 20 meters, giving a σ_{yo} of 4.65 meters.

Table 9. EMISSIONS RELEASE PARAMETERS

Release Point /Location	**Source Type**	**Stack Height (m)[a]**	**Modeled Diameter (m)**	**Stack Gas Temp. (K)[b]**	**Stack Gas Flow Velocity (m/sec)[c]**
DRYERSTK	Point	8.5	1.6	394	18.7
TNKHTR	Point	4.3	0.11	450	8.5
SILOFILL[d]	Point	20.3	3.0	346	0.1
SILOLOUT[d]	Point	3.7	3.0	346	0.1
Volume Sources					
Release Point /Location	**Source Type**	**Release Height (m)**	**Initial Horizontal Dispersion Coefficient σ_{y0} (m)**	**Initial Vertical Dispersion Coefficient σ_{z0} (m)**	
AGGBIN	Volume	2.5	7.0[e] (4.65)[e]	1.2[e] (1.16)[e]	
CONV	Volume	5.0	7.0[e] (4.65)[e]	1.2[e] (1.16)[e]	
SILOFILL[d]	Volume	20.3	0.74	9.4	
SILOLOUT[d]	Volume	3.7	0.74	9.4	

a. Meters.
b. Kelvin.
c. Meters per second.
d. Modeled by Spidell as a volume source. DEQ verification analyses modeled these sources as a point source.
e. DEQ parameters in parentheses.

3.4 Results for Significant and Cumulative NAAQS Impact Analyses

Table 10 provides submitted results for the Significant Impact Analyses. Cumulative NAAQS impact analyses were required for 24-hour PM_{10}, 3-hour SO_2, and 24-hour SO_2 since impacts exceeded SILs. Table 11 provides results for the cumulative NAAQS impact analyses. DEQ performed verification analyses for 24-hour PM_{10} that involved the following adjustments to the analyses performed by Spidell:

- Use Sandpoint meteorological data rather than Spokane meteorological data because of the questionably representativeness of Spokane data.
- Use the maximum of 2[nd] highest modeled concentrations, rather than the maximum of 6[th] highest, because of questionable representativeness of the meteorological data.
- Model silo filling and silo loadout emissions as point sources rather than volume sources to account for thermal buoyancy and downwash caused by the office building and silo structures.

Table 10. RESULTS FOR SIGNIFICANT IMPACT ANALYSES				
Pollutant	Averaging Period	Maximum Modeled Concentration[a] (μg/m³)[b]	SIL[c] (μg/m³)	Exceeds SIL
PM_{10}[d]	24-hour	50.23 (65.3)	5	Yes
	Annual	0.849	1	No
Carbon monoxide (CO)	1-hour	518.2	2,000	No
	8-hour	271.9	500	No
Sulfur dioxide (SO_2)	3-hour	30.28	25	Yes
	24-hour	8.51	5	Yes
	Annual	0.12	1	No
Nitrogen dioxide (NO_2)	Annual	0.066	1	No

[a]Values in parentheses were obtained through DEQ verification modeling.
[b]Micrograms per cubic meter.
[c]Significant Impact Level.
[d]Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers.

Table 11. RESULTS FOR CUMULATIVE IMPACT ANALYSES						
Pollutant	Averaging Period	Maximum Modeled Concentration[a] (μg/m³)[b]	Background Concentration (μg/m³)	Total Ambient Impact (μg/m³)	NAAQS[c] (μg/m³)	Percent of NAAQS
PM_{10}[d]	24-hour	38.1[e] (57.4)[f]	69	107.1 (126.4)[f]	150	71 (84)[f]
Sulfur dioxide (SO_2)	3-hour[g]	27.5	34	61.5	1,300	5
	24-hour[g]	7.4	26	33.4	365	9

[a]Values in parentheses were obtained through DEQ verification modeling.
[b]Micrograms per cubic meter.
[c]National ambient air quality standards.
[d]Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers.
[e]Modeled design value is the maximum 6th highest modeled value from a 5-year meteorological data set.
[f]Modeled design value is the maximum 2nd highest modeled value from a 5-year meteorological data set.
[g]Modeled design value is the maximum 2nd highest modeled value from a 5-year meteorological data set.

DEQ's verification analysis results were measurably greater than those obtained by Spidell. This can be attributed to the more conservative assumptions and methods used in DEQ's analyses. Results from both analyses were in compliance with the 24-hour PM_{10} NAAQS. Considering the results of both Spidell's and DEQ's PM_{10} 24-hour analyses, compliance with NAAQS has been demonstrated to DEQ's satisfaction.

3.5 Results for TAP Impact Analyses

Table 12 provides results for the submitted TAPs analyses. The submitted application indicates emissions of naphthalene exceeded the PAH Emissions Screening Level (EL); however, modeling results were not submitted for naphthalene as a PAH. DEQ performed the PAH analyses using the base files submitted by Spidell, and results in Table 12 for PAH reflect DEQ's results. Impacts of all TAPs modeled were below applicable AACs/AACCs.

Table 12. RESULTS FOR TAP IMPACT ANALYSES			
Pollutant	Averaging Period	Modeled Impact ($\mu g/m^3$)[a]	AAC/AACC[b] ($\mu g/m^3$)
Arsenic	Annual	1.50E-6	2.3E-4
Benzene	Annual	1.30E-3	1.2E-1
Cadmium	Annual	1.11E-6	5.6E-4
Chromium VI	Annual	1.13E-6	8.3E-5
Formaldehyde	Annual	8.79E-3	7.7E-2
Nickel	Annual	1.54E-4	4.2E-3
PAH (naphthalene)	Annual	1.68E-3	1.4E-2
Phosphorous	24-hour	1.47E-2	5.0E+0
POM	Annual	1.79E-4	3.0E-4

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

3.5 Locating with Other Facilities/Equipment

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

HMA plants commonly co-locate with rock crushing plants. Since the 24-hour PM_{10} impacts are the governing criteria for the POE facility (governing for criteria pollutants – contributions of TAPs from other facilities are not considered in permitting analyses for the HMA plant), simultaneously operation on an annual basis is not a large concern. DEQ modeling staff determined NAAQS compliance is still assured when a rock crushing plant co-locates with the HMA plant, provided the HMA plant does not operate during any day when the rock crushing plant is operating and the annual actual throughput of the rock crushing plant is not greater than 500,000 tons. DEQ modeling staff also determined NAAQS compliance is assured when operating the HMA plant during the same day as the rock crushing plant, provided the throughput of the HMA plant is half that assumed for the modeling analyses performed in support of this project.

4.0 Conclusions

The ambient air impact analyses demonstrated to DEQ's satisfaction that emissions from the POE HMA plant at the Post Falls location will not cause or significantly contribute to a violation of any ambient air quality standard.

ATTACHMENT 1

EMISSIONS CALCULATIONS AND MODELING PARAMETERS FOR

DEQ'S AIR IMPACT ANALYSES

HMA Plant Modeled Emissions Rates

Drum Dryer, Asphalt Silo Filling, Asphalt Loadout, and Asphalt Tank Heater Emissions

Emissions were taken from submitted model input files.

Aggregate Handling Emissions

Emissions from aggregate handling by frontend loaders were calculated for the following transfers: 1) aggregate to a storage pile; 2) aggregate from a pile to a hopper.

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

Emissions were calculated using the following emissions equation:

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

Where:

k	=	0.35 for PM_{10}
M	=	5% for aggregate
U	=	wind speed (mph)

A moisture content of 3% to 7% was estimated as a typical moisture content of aggregate entering the dryer, per STAPPA-ALAPCO-EPA, Emission Inventory Improvement Program, Volume II, Chapter 3, Preferred and Alternative Methods for Estimating Air Emissions from Hot Mix Asphalt Plants, Final Report, July 1996.

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

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

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

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

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

Spidell's analyses used a Category 6 adjustment factor of 5.006 rather than DEQ's value of 3.768. This difference occurred because Spidell used an upper bound windspeed of 20.06 m/sec rather than 14 m/sec. DEQ determined both values are reasonably conservative.

For the operational scenario for 6,000 ton/day HMA and 250,000 ton/year HMA, emissions from frontend loader handling of aggregate are as follows:

Daily PM_{10}:

7.646 E-4 lb PM_{10}	5,760 ton	day	2 transfers	=	0.3670 lb
ton	day	24 hr			hr

Annual PM_{10}:

7.646 E-4 lb PM_{10}	240,000 ton	yr	2 transfers	=	0.04190 lb
ton	yr	8,760 hour			hr

Daily and annual throughputs were based on aggregate being 96% of the total HMA production.

The values listed above are nearly identical to those used in the submitted analyses and listed in Table 5 of this memorandum.

These sources were modeled in DEQ's verification analyses as a single volume source with a 20-meter square area, 5.0 meters thick, with a release height of 2.5 meters. The initial dispersion coefficients were calculated as follows:

σ_{yo} = 20 m / 4.3 = 4.65 m

σ_{zo} = 5 m / 4.3 = 1.16 m

Conveyors and Screens Emissions

These sources include the scalping screen and conveyor transfers. Controlled emissions factors for the conveyor transfers and the scalping screen were used, assuming the control measures used would be equivalent to the application of water sprays.

Daily and annual throughputs were based on aggregate being 96% of the total HMA production.

For the operational scenario for 6,000 ton/day HMA and 250,000 ton/year HMA, emissions are as follows:

Scalping Screen (controlled emissions):

Daily PM_{10}:

$$\frac{0.00074\ \text{lb}\ PM_{10}}{\text{ton}} \times \frac{5{,}760\ \text{ton}}{\text{day}} \times \frac{\text{day}}{24\ \text{hour}} = \frac{0.1776\ \text{lb}}{\text{hr}}$$

Annual PM_{10}:

$$\frac{0.00074\ \text{lb}\ PM_{10}}{\text{ton}} \times \frac{240{,}000\ \text{ton}}{\text{yr}} \times \frac{\text{yr}}{8{,}760\ \text{hour}} = \frac{0.02027\ \text{lb}}{\text{hr}}$$

Conveyor Transfers (controlled emissions):

Daily PM_{10}:

$$\frac{4.60\ \text{E-5 lb}\ PM_{10}}{\text{ton}} \times \frac{5{,}760\ \text{ton}}{\text{day}} \times \frac{\text{day}}{24\ \text{hour}} \times 3\ \text{transfers} = \frac{0.03312\ \text{lb}}{\text{hr}}$$

Annual PM_{10}:

$$\frac{4.60\ \text{E-5 lb}\ PM_{10}}{\text{ton}} \times \frac{240{,}800\ \text{ton}}{\text{yr}} \times \frac{\text{yr}}{8{,}760\ \text{hour}} \times 3\ \text{transfers} = \frac{0.003781\ \text{lb}}{\text{hr}}$$

Total Daily Emissions (unloading, screening, conveyors) = 0.2107 lb/hr

Total Annual Emissions (unloading, screening, conveyors) = 0.02405 lb/hr

The values listed above are nearly identical to those used in the submitted analyses and listed in Table 5 of this memorandum.

These sources were modeled in DEQ's verification analyses as a single volume source with a 20-meter square area, 5.0 meters thick, with a release height of 5.0 meters. The initial dispersion coefficients are calculated as follows:

$\sigma_{yo} = 20\ \text{m} / 4.3 = 4.65\ \text{m}$

$\sigma_{zo} = 5\ \text{m} / 4.3 = 1.16\ \text{m}$

HMA Plant Modeling Parameters

Dryer Baghouse Stack

Release height = 8.5 meters; effective diameter of release area = 1.6 meters;
typical stack gas temperature = 394 K; typical flow velocity = 18.7 meters/second

Asphalt Silo Filling

Spidell modeled as volume source that is on or adjacent to a structure that is 66.5 ft high and 10.5 ft wide, with a release height of 66.5 ft (20.3 m).

Initial dispersion coefficients:

σ_{y0} = 20.3 m / 2.15 = 9.4 m

σ_{z0} = 3.2 m / 4.3 = 0.74 m

DEQ modeled this source as a point source.
- release height of 20.3 meters (equal to height of Gob Hopper above silos)
- stack diameter of 3 meters, corresponding to the assumed diameter of the hopper
- gas temperature was estimated at half the AP42 default asphalt temperature: 325° F / 2 = 163° F
- stack velocity of 0.1 m/sec to account for convective air flow.

Asphalt Loadout

Spidell modeled as volume source, that is on or adjacent to a structure that is 66.5 ft high and 10.5 ft wide, with a release height of 12.3 ft (3.75 m).

Initial dispersion coefficients:

σ_{y0} = 20.3 m / 2.15 = 9.4 m

σ_{z0} = 3.2 m / 4.3 = 0.74 m

DEQ modeled this source as a point source.
- release height of 3.7 meters (equal to height of truck bed).
- stack diameter of 3 meters, corresponding to the assumed diameter of the silo at that point.
- gas temperature was estimated at half the AP42 default asphalt temperature: 325° F / 2 = 163° F.
- stack velocity of 0.1 m/sec to account for convective air flow.

Aggregate to and from Storage

Spidell's analyses released emissions in the model as a volume source not on or adjacent to a structure, with emissions from a 30 m X 30 m area 5 m high, released at 2.5 m.

Initial dispersion coefficients for Spidell's analyses:

σ_{y0} = 30 m / 4.3 = 7.0 m

σ_{z0} = 5 m / 4.3 = 1.2 m

Release emissions in DEQ verification model from a 20 m X 20 m area 5 m high, released at 2.5 m

Initial dispersion coefficients for DEQ's analyses:

σ_{y0} = 20 m / 4.3 = 4.65 m

σ_{z0} = 5 m / 4.3 = 1.16 m

Sources include: two transfers, equivalent in emissions to that of a frontend loader, from the point of aggregate delivery to transfer to the HMA plant hopper.

Conveyor Transfers and Scalping Screen

Spidell's analyses released emissions in the model as a volume source not on or adjacent to a structure, with emissions from a 30 m X 30 m area 5 m high, released at 5 m.
Initial dispersion coefficients for Spidell's analyses:

σ_{y0} = 30 m / 4.3 = 7.0 m

σ_{z0} = 5 m / 4.3 = 1.2 m

Release emissions in DEQ verification model from a 20 m X 20 m area 5 m high, released at 5 m

Initial dispersion coefficients for DEQ's analyses:

σ_{y0} = 20 m / 4.3 = 4.65 m

σ_{z0} = 5 m / 4.3 = 1.16 m

Sources include: all conveyor transfers associated with HMA operations

Asphalt Oil Heater

Parameters for the 0.6 MMBtu/hr diesel-fired boiler were provided by the applicant and are as follows:

Stack height = 4.3 m; stack diameter = 0.11 meters; stack gas temperature = 450 K; flow velocity = 8.5 meters/second

APPENDIX C – FACILITY DRAFT COMMENTS

The following comments were received from the facility on March 4, 2011:

Facility Comment: In the draft permit, on page 3, Item 4, Table 1 the Baghouse should be Model: APM 1080.

DEQ Response: Typo corrected in permit and in statement of basis.

APPENDIX D – PROCESSING FEE

PTC Fee Calculation

Instructions:
Fill in the following information and answer the following questions with a Y or N. Enter the emissions increases and decreases for each pollutant in the table.

Company: POE Asphalt Paving, Inc.
Address: 2732 North Beck Road
City: Post Falls
State: ID
Zip Code: 83854
Facility Contact: John Cushman
Title: Equipment Manager
AIRS No.: 777-00057

N Does this facility qualify for a general permit (i.e. concrete batch plant, hot-mix asphalt plant)? Y/N

Y Did this permit require engineering analysis? Y/N

N Is this a PSD permit Y/N (IDAPA 58.01.01.205.04)

Emissions Inventory			
Pollutant	Annual Emissions Increase (T/yr)	Annual Emissions Reduction (T/yr)	Annual Emissions Change (T/yr)
NO_X	3.3	19.44	-16.2
SO_2	0.5	34.69	-34.2
CO	16.3	20.52	-4.3
PM10	2.9	1.73	1.2
VOC	0.0	15.12	-15.1
TAPS/HAPS	1.5	0	1.5
Total:	24.4	91.5	**-67.1**
Fee Due	**$ 1,000.00**		

Comments: