Statement of Basis
Hot Mix Asphalt Plant General Permit

Permit to Construct No. P-2018.0029
Project ID 62351

Dixie River dba Rock Sand & Gravel 00586
Portable Throughout the State of Idaho

Facility ID 777-00586

Final

April 7, 2020
Joe Palmer
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
acfm	actual cubic feet per minute
ASTM	American Society for Testing and Materials
Btu	British thermal units
CAA	Clean Air Act
CAM	Compliance Assurance Monitoring
CBP	concrete batch plant
CEMS	continuous emission monitoring systems
cfm	cubic feet per minute
CFR	Code of Federal Regulations
CI	compression ignition
CMS	continuous monitoring systems
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	CO_2 equivalent emissions
COMS	continuous opacity monitoring systems
DEQ	Department of Environmental Quality
dscf	dry standard cubic feet
EL	screening emission levels
EPA	U.S. Environmental Protection Agency
FEC	Facility Emissions Cap
GHG	greenhouse gases
gr	grains (1 lb = 7,000 grains)
HAP	hazardous air pollutants
HMA	hot mix asphalt
hp	horsepower
ICE	internal combustion engines
IDAPA	a numbering designation for all administrative rules in Idaho promulgated in accordance with the Idaho Administrative Procedures Act
km	kilometers
lb/hr	pounds per hour
lb/qtr	pound per quarter
m	meters
MACT	Maximum Achievable Control Technology
MMBtu	million British thermal units
MMscf	million standard cubic feet
NAAQS	National Ambient Air Quality Standard
NESHAP	National Emission Standards for Hazardous Air Pollutants
NO_2	nitrogen dioxide
NO_X	nitrogen oxides
NSPS	New Source Performance Standards
O_2	oxygen
PAH	polyaromatic hydrocarbons
PERF	Portable Equipment Relocation Form
PM	particulate matter
$PM_{2.5}$	particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers
PM_{10}	particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers
POM	polycyclic organic matter
ppm	parts per million
PSD	Prevention of Significant Deterioration

PTC	permit to construct
PTE	potential to emit
PW	process weight rate
RAP	recycled asphalt pavement
RFO	reprocessed fuel oil
Rules	*Rules for the Control of Air Pollution in Idaho*
scf	standard cubic feet
SCL	significant contribution limits
SIP	State Implementation Plan
SM	synthetic minor
SM80	synthetic minor facility with emissions greater than or equal to 80% of a major source threshold
SO_2	sulfur dioxide
SO_x	sulfur oxides
T/hr	tons per hour
T/yr	tons per consecutive 12 calendar month period
TAP	toxic air pollutants
T-RACT	Toxic Air Pollutant Reasonably Available Control Technology
ULSD	ultra-low sulfur diesel
U.S.C.	United States Code
VOC	volatile organic compounds
yd^3	cubic yards
$\mu g/m^3$	micrograms per cubic meter

FACILITY INFORMATION

Description

Dixie River dba River Rock Sand & Gravel 00586 has proposed to co-locate an existing portable drum-mix asphalt plant with the stationary Dixie River dba River Rock Sand & Gravel concrete batch plant located at 22027 Weitz Road, Caldwell, Idaho. The asphalt plant will remain portable throughout the state of Idaho. The asphalt plant consists of a counter-flow asphalt drum mixer equipped with a with a bag house to control particulate matter, an asphaltic oil storage tank with a heater, and materials transfer equipment. Materials transfer equipment at the facility will include front end loaders, feed bins, storage silos, conveyors, stock piles, and haul trucks.

Asphalt is made at the facility as follows. First, stockpiled aggregate is transferred to feed bins. Recycled asphalt pavement (RAP) can be used in the aggregate (up to 50% can be allowed). Aggregate is then dispensed from the feed bins onto feeder conveyors, which transfer the aggregate to the asphalt drum mixer. The asphalt drum mixer is fired on natural gas, LPG/propane, #2 diesel fuel, and used oil (RFO). Next, aggregate travels through the rotating drum mixer, and when dried and heated, it is mixed with hot liquid asphaltic oil. The asphaltic oil is heated by the asphalt tank heater to allow it to flow and be mixed with the hot, dry aggregate. The resulting asphalt is conveyed to hot storage bins until it can be loaded into trucks for transport off-site or transferred to silos for temporary storage prior to transport off-site. As part of the operation, a portable rock crusher is allowed to be co-located at the facility if it is not located at the concrete batch plant located at 22027 Weitz Road, Caldwell, Idaho.

When the portable asphalt plant is co-located with the concrete batch plant located at 22027 Weitz Road, Caldwell, Idaho, only line power will be used. IC engine electrical generators shall not be used.

Line power and portable electrical generators will be used at the facility when located away from the concrete batch plant located at 22027 Weitz Road, Caldwell, Idaho.

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).

July 30, 2018	P-2018.0029, Initial PTC for a new portable facility, Permit status (A, but will become S upon issuance of this permit)

Application Scope

This application is requesting to modify the existing PTC to include co-location with a stationary concrete batch plant and a facility name change. The applicant would also like the asphalt plant to maintain its portable status.

If the asphalt plant is located portably away from the concrete batch plant located at 22027 Weitz Road, Caldwell, Idaho, the following two bulleted paragraphs apply:

- The asphalt plant will be fed a mixture of crushed fines and aggregates from a collocated crusher. The rock crusher will be permitted independently from the asphalt plant. In the case of collocation of an asphalt plant with an additional rock crushing plant (secondary to the one rock crushing plant allowed by the permit), the modeling completed by DEQ requires a minimum separation distance of 1,000 ft.
- Two compression ignition IC engines powering electrical generators, a primary and a secondary, will be used to provide electricity for the facility when line power is not available.

The remaining bulleted paragraphs below apply whether the plant is co-located with the concrete batch plant located at 22027 Weitz Road, Caldwell, Idaho or located elsewhere in Idaho:

- The process begins with materials being fed via front end loader to a compartment bin feeder system and then dispensed in metered proportions to a collecting conveyor. The material will pass over a scalping screen before being conveyed into the drum mixer via a scalping screen.
- Inside the drum mixer the aggregates will be heated to specification temperature and then asphaltic oil is added. In some instances up to 50% RAP may be substituted for virgin aggregate.

- The mixed asphalt is dispensed to a slat conveyor and then lifted up to a hot storage silo for intermediate storage. Trucks are then loaded by driving under the hot storage silo.
- The silo loading process will be enclosed and vented back to the drum via suction induced either through the conveyor or via a separate duct line. The unloading process will be uncontrolled.
- Particulate emissions will be controlled by maintaining the moisture content at 1.5% by weight for all ¼ in and smaller aggregate feed materials via water sprays. In addition, all particulate emissions from the asphalt drum mixer will be collected and vented to a high efficiency baghouse with a minimum control efficiency of 98% as proposed by the Applicant.
- The asphalt plant will include a hot oil heating system designed to keep asphaltic oil at specification temperature. Heat will be provided via a fuel oil external combustion burner. This burner will operate intermittently during 24-hours per day much the way a hot water heater cycles. Typical burner operation during any 24-hour period is less than 8 hours.
- Asphalt production rate throughput limits of 150 tons per hour, 1,800 tons per day, and 175,000 tons per year.

Application Chronology

December 13, 2019	DEQ received an application and an application processing fee.
January 2, 2020	DEQ determined the application was incomplete.
January 6, 2020	DEQ received supplemental information from the applicant.
February 5, 2020	DEQ determined the application was complete.
February 25 – March 11, 2020	DEQ provided an opportunity to request a public comment period on the application and proposed permitting action.
March 13, 2020	DEQ made available the draft permit and statement of basis for peer and regional office review.
March 23, 2020	DEQ made available the draft permit and statement of basis for applicant review.
April 7, 2020	DEQ issued the final permit and statement of basis.

TECHNICAL ANALYSIS

The asphalt production facility utilizes a baghouse for control of particulate matter emissions from the asphalt drum mixer. In addition, the Applicant will maintain the moisture content in ¼” or smaller aggregate material at 1.5% by weight, using water sprays, using shrouds, or will use other emissions controls to minimize PM_{10} emissions from aggregate handling.

Emissions Units and Control Equipment

Table 1 EMISSIONS UNIT AND CONTROL EQUIPMENT INFORMATION

Source ID No.	Sources	Control Equipment	Emission Point ID No.
Materials Handling	Material Transfer Points: Materials handling Asphalt aggregate transfers Truck unloading of aggregate Aggregate conveyor transfers Aggregate handling	Maintaining the moisture content in ¼" or smaller aggregate material at 1.5% by weight, using water sprays, using shrouds, or other emissions controls	N/A
Hot Mix Asphalt Drum Mixer	Asphalt Drum Mixer: Manufacturer: Genco Model: Roadrunner Type: Counter-flow Manufacture Date: 1997 Max. production: 150 T/hr, 1,800 T/hr, and 175,000 T/yr Fuel(s): Natural gas, LPG/Propane,#2 fuel oil, and used oil (RFO) #2 fuel sulfur content: 0.0015% by weight Used oil (RFO) sulfur content: 0.5% by weight	Asphalt Drum Mixer Baghouse: Manufacturer: Gencor Model: Portable Type: Reverse pulse-jet Flow rate: 31,390 dscf PM_{10} control efficiency: 98.0%	Exit height: 20 ft (6.1 m) Exit diameter: 3.4 ft (1.04 m) Exit flow rate: 31,390 acfm Exit temperature: 275 °F (135 ºC)
Asphaltic Oil Tank Heater	Asphaltic Oil Tank Heater: Heat input rating: 1.0 MMBtu/hr Fuel : #2 fuel oil Liquid fuel sulfur content: 0.0015% by weight	N/A	Exit height: 8 ft (2.44 m) Exit diameter: 0.25 ft (0.076 m) Exit flow rate: 17,968 acfm Exit temperature: 325 °F (163 ºC)
Primary IC Engine	Primary IC Engine: Manufacturer: Caterpillar Model: C27 Acert Manufacture Date: 2014 Max. power rating: 800 bhp Fuel: ULSD (0.0015% S by weight) Fuel consumption: 41 gal/hr Daily use limit: 24 hrs/day Annual use limit: 4,500 hrs/yr	N/A	Exit height: 12.5 ft (3.8 m) Exit diameter: 0.67 ft (0.20 m) Exit flow rate: 5916 acfm Exit temperature: 130 °F (54ºC)
Secondary IC Engine	Secondary IC Engine: Manufacturer: Isuzu Model: DB-0501i2 Manufacture Date: August 2006 Max. power rating: 65 bhp Fuel: ULSD (0.0015% S by weight) Fuel consumption: 4 gal/hr Daily use limit: 24 hrs/day Annual use limit: 4,500 hrs/yr	N/A	Exit height: 6.0 ft (1.8 m) Exit diameter: 0.21 ft (0.064 m) Exit flow rate: 175 acfm Exit temperature: 124 °F (51 ºC)

Emissions Inventories

Potential to Emit

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

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

- Maximum asphalt throughput does not exceed 150 ton HMA/hour, 1,800 ton HMA/day, and 175,000 ton HMA/year (per the Applicant).
- Emissions from the asphalt drum dryer were based on the maximum emissions from using any of the proposed fuels for combustion in the drum dryer.
- When the asphalt plant is portably located away from the concrete batch plant located at 22027 Weitz Road, Caldwell, Idaho, the following conditions apply:
  - Emissions from a portable rock crusher were included in the emissions modeling analysis with the assumption that when the co-located rock crusher is operating, the asphalt plant is operating at half (900 ton HMA/day) of its maximum capacity.
  - Any emissions unit outside a 1,000 ft radius from the asphalt plant was not included in the emissions modeling analysis for this project.
  - The primary IC engine powering a generator has a maximum brake-horsepower rating of less than less than or equal to 800 bhp, and proposed operation of up to 24 hour/day and 4,500 hour/year (per the Applicant).
  - The secondary IC engine powering a generator has a maximum brake-horsepower rating of less than or equal to 55.3 bhp and proposed operation of up to 24 hour/day and 4,500 hour/year (per the Applicant).

Uncontrolled Potential to Emit

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

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

The following table presents the post project uncontrolled emissions for regulated air pollutants as submitted by the Applicant and verified by DEQ staff. Uncontrolled emissions were determined as follows:

- For the asphalt drum mixer uncontrolled emissions were assumed to be based upon four times the proposed annual throughput (4 x 175,000 T/yr = 700,000 T/yr).
- For the asphaltic oil tank heater controlled emissions were scaled up from 4,500 hours per year of permitted operation (as proposed by the Applicant) to 8,760 hours per year for full-time operation.
- For the materials handling operation controlled and uncontrolled emissions were assumed to be equal.

- For the primary IC engine controlled emissions were scaled up from 4,500 hours per year of permitted operation (as proposed by the Applicant) to 8,760 hours per year for full-time operation.
- For the secondary IC engine controlled emissions were scaled up from 4,500 hours per year of permitted operation (as proposed by the Applicant) to 8,760 hours per year for full-time operation.

The following table presents the uncontrolled Potential to Emit for criteria pollutants as calculated per the DEQ HMA EI spreadsheet. The Tier 4 Final IC engine emission factors are from 40 CFR 1039.101 as Tier 4 is currently not in the HMA EI spreadsheet. See Appendix A for a detailed presentation of the calculations of these emissions for each emissions unit.

Table 2 UNCONTROLLED POTENTIAL TO EMIT FOR REGULATED AIR POLLUTANTS

Emissions Unit	$PM_{10}/PM_{2.5}$	SO_2	NO_X	CO	VOC
	T/yr	T/yr	T/yr	T/yr	T/yr
Asphalt drum mixer	8.05	31.15	19.25	45.5.50	11.2
Asphaltic oil tank heater	0.07	2.27	0.77	0.16	0.02
Primary IC engine and Secondary IC engine	0.42	0.04	7.37	22.5	1.81
Load-out and silo filling	0.39	0.00	0.00	0.89	1.41
Materials handling	0.35	0.00	0.00	0.00	0.00
Total, Point Sources	**9.28**	**33.46**	**27.39**	**69.55**	**14.44**

The following table presents the uncontrolled Potential to Emit for HAP pollutants as calculated per the DEQ HMA EI spreadsheet. See Appendix A for a detailed presentation of the calculations emissions for each emissions unit. Worst-case HAPs emissions were based upon the same assumptions as for criteria pollutants.

Table 3 **UNCONTROLLED POTENTIAL TO EMIT FOR HAZARDOUS AIR POLLUTANTS**

IDAPA Listing	Hazardous Air Pollutants	Uncontrolled PTE (T/yr)
585	Dioxins	3.40E-08
	Furans	4.94E-08
	Acrolein	9.48E-03
	Antimony	2.31E-04
	Barium	2.11E-03
	Chromium	1.95E-03
	Cobalt	2.02E-04
	Copper	1.14E-03
	Ethyl benzene	8.40E-02
	Hexane	3.22E-01
	Manganese	2.79E-03
	Methyl chloroform	1.68E-02
	Methyl ethyl ketone (MEK)	7.00E-03
	Molybdenum	2.52E-05
	Naphthalene	7.35E-02
	Pentane	2.31E-01
	Phosphorus	1.01E-02
	Propionaldehyde	4.55E-02
	Quinone	5.60E-02
	Selenium	1.44E-04
	Silver	1.68E-04
	Thallium	1.44E-06
	Toluene	1.02E+00
	Vanadium	1.02E-03
	Xylene	7.53E-02
	Zinc	2.23E-02
586	Acetaldehyde	4.57E-01
	Arsenic	2.38E-04
	Benzene	1.57E-01
	Benzo(a)anthracene	9.21E-05
	Benzo(a)pyrene	1.01E-05
	Benzo(b)fluoranthene	6.56E-05
	Benzo(k)fluoranthene	2.00E-05
	Beryllium	8.89E-07
	1,3-Butadiene	7.79E-05
	Cadmium	1.56E-04
	Chrysene	1.01E-04
	Dibenzo(a,h)anthracene	9.65E-06
	Formaldehyde	1.09E+00
	Hexavalent Chromium	1.65E-04
	Indeno(1,2,3-cd)pyrene	1.34E-05
	3-Methylchloranthrene	0.00E+00
	Nickel	2.48E-02
Not listed	Acenaphthene	6.25E-04
	Acenaphthylene	7.94E-03
	Anthracene	1.12E-03
	Benzo(e)pyrene	3.85E-05
	Benzo(g,h,l)perylene	2.86E-05
	Dichlorobenzene	0.00E+00
	Fluoranthene	3.29E-04
	Fluorene	4.22E-03
	Isooctane	1.40E-02
	Mercury	9.14E-04
	2-Methylnaphthalene	5.95E-02
	Perylene	3.08E-06
	Phenanthrene	9.27E-03
	Pyrene	1.15E-03
	Total	**3.81**

Pre-Project Potential to Emit

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

The following table presents the pre-project 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 4 PRE-PROJECT POTENTIAL TO EMIT FOR REGULATED AIR POLLUTANTS

Emissions Unit	$PM_{10}/PM_{2.5}$		SO_2		NO_X		CO		VOC	
	lb/hr[(a)]	T/yr[(b)]	lb/hr[(a)]	T/yr[(b)]	lb/hr[(a)]	T/yr[(b)]	lb/hr[(a)]	T/yr[(b)]	lb/hr[(a)]	T/yr[(b)]
Asphalt drum mixer	3.45	2.01	13.35	7.79	8.25	4.81	19.50	11.38	4.80	2.80
Asphaltic oil tank heater	0.017	0.04	0.05	0.12	0.18	0.39	0.04	0.08	0.004	0.009
Primary IC engine and Secondary IC engine	0.10	0.22	0.01	0.02	1.68	3.79	5.14	11.6	0.41	0.93
Load-out and silo filling	0.17	0.10	0.00	0.00	0.00	0.00	0.38	0.22	0.61	0.35
Pre-Project Totals	**3.74**	**2.37**	**13.41**	**7.93**	**10.11**	**8.99**	**25.06**	**23.28**	**5.82**	**4.09**

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.

Post Project Potential to Emit

The following table presents the post project Potential to Emit for criteria pollutants from all emissions units at the facility as determined by DEQ staff. See Appendix A for a detailed presentation of the calculations of these emissions for each emissions unit.

Table 5 POST PROJECT POTENTIAL TO EMIT FOR REGULATED AIR POLLUTANTS

Emissions Unit	$PM_{10}/PM_{2.5}$		SO_2		NO_X		CO		VOC	
	lb/hr[(a)]	T/yr[(b)]	lb/hr[(a)]	T/yr[(b)]	lb/hr[(a)]	T/yr[(b)]	lb/hr[(a)]	T/yr[(b)]	lb/hr[(a)]	T/yr[(b)]
Asphalt drum mixer	3.45	2.01	13.35	7.79	8.25	4.81	19.50	11.38	4.80	2.80
Asphaltic oil tank heater	0.017	0.04	0.05	0.12	0.18	0.39	0.04	0.08	0.004	0.009
Primary IC engine and Secondary IC engine	0.10	0.22	0.01	0.02	1.68	3.79	5.14	11.6	0.41	0.93
Load-out and silo filling	0.17	0.10	0.00	0.00	0.00	0.00	0.38	0.22	0.61	0.35
Post Project Totals	**3.74**	**2.37**	**13.41**	**7.93**	**10.11**	**8.99**	**25.06**	**23.28**	**5.82**	**4.09**

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.

As demonstrated in Tables 2 and 4, this facility has uncontrolled potential to emit for PM_{10}, SO_2, NO_X, CO, and VOC emissions less than the Major Source threshold of 100 T/yr and a controlled potential to emit for PM_{10}, SO_2, NO_X, CO, and VOC emissions less than the Major Source threshold of 100 T/yr. In addition, as demonstrated in Table 3, this facility has an uncontrolled potential to emit for HAP emissions less than the Major Source threshold of 10 T/yr for any one HAP and 25 T/y for all HAPs combined. Therefore, this facility is designated as a Minor facility.

Change in Potential to Emit

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

Table 6 CHANGES IN POTENTIAL TO EMIT FOR REGULATED AIR POLLUTANTS

Emissions	$PM_{10}/PM_{2.5}$		SO_2		NO_X		CO		VOC	
	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr
Pre-Project Potential to Emit	3.74	2.37	13.41	7.93	10.11	8.99	25.06	23.28	5.82	4.09
Post Project Potential to Emit	3.74	2.37	13.41	7.93	10.11	8.99	25.06	23.28	5.82	4.09
Changes in Potential to Emit	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Non-Carcinogenic TAP Emissions

A summary of the estimated PTE emissions increase of non-carcinogenic toxic air pollutants (TAPs) is provided in the following table.

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

Non-Carcinogenic Toxic Air Pollutants	Pre-Project 24-hour Average Emissions Rates for Units at the Facility (lb/hr)	Post Project 24-hour Average Emissions Rates for Units at the Facility (lb/hr)	Change in 24-hour Average Emissions Rates for Units at the Facility (lb/hr)	Non-Carcinogenic Screening Emission Level (lb/hr)	Exceeds Screening Level? (Y/N)
Acetone	6.29E-02	6.29E-02	0.0000	119	No
Acrolein	2.04-03	2.04-03	0.0000	0.017	No
Antimony	3.27E-05	3.27E-05	0.0000	0.033	No
Barium	4.44E-04	4.44E-04	0.0000	2	No
Carbon disulfide	1.87E-04	1.87E-04	0.0000	0.033	No
Chromium metal (II and III)	4.16E-04	4.16E-04	0.0000	0.033	No
Cobalt metal dust, and fume	2.39E-05	2.39E-05	0.0000	0.0033	No
Copper (fume)	2.39E-04	2.39E-04	0.0000	0.013	No
Crotonaldehyde	6.45E-03	6.45E-03	0.0000	0.38	No
Cumene	3.43E-04	3.43E-04	0.0000	16.3	No
Ethyl benzene	1.92E-02	1.92E-02	0.0000	29	No
Ethyl chloride (Chloroethane)	3.72E-05	3.72E-05	0.0000	176	No
Heptane	7.05E-01	7.05E-01	0.0000	109	No
Hexane	7.04E-02	7.04E-02	0.0000	12	No
Manganese as Mn (fume)	5.88E-04	5.88E-04	0.0000	0.067	No
Mercury (alkyl compounds as Hg)	1.95E-04	1.95E-04	0.0000	0.001	No
Methyl bromide	7.47E-05	7.47E-05	0.0000	1.27	No
Methyl chloride (Chloromethane)	2.57E-04	2.57E-04	0.0000	6.867	No
Methyl chloroform	3.60E-03	3.60E-03	0.0000	127	No
Methyl ethyl ketone (MEK)	2.01E-03	2.01E-03	0.0000	39.3	No
Molybdenum (soluble)	2.87E-06	2.87E-06	0.0000	0.333	No
Pentane	1.58E-02	1.58E-02	0.0000	118	No
Phenol	3.02E-04	3.02E-04	0.0000	1.27	No
Phosphorous	2.13E-03	2.13E-03	0.0000	0.007	No
Propionaldehyde	9.75E-03	9.75E-03	0.0000	0.0287	No
Quinone	1.20E-02	1.20E-02	0.0000	0.027	No
Selenium	2.87E-05	2.87E-05	0.0000	0.013	No
Silver as Ag (soluble)	3.60E-05	3.60E-05	0.0000	0.001	No
Styrene monomer	7.21E-05	7.21E-05	0.0000	6.67	No
Thallium	3.08E-07	3.08E-07	0.0000	0.007	No
Toluene	2.19E-01	2.19E-01	0.0000	25	No
Trichloroethylene	0.00E+00	0.00E+00	0.0000	17.93	No
Vanadium as V_2O_5, (respirable dust and fume)	1.16E-04	1.16E-04	0.0000	0.003	No
Xylene	2.11E-02	2.11E-02	0.0000	29	No
Zinc metal	4.68E-03	4.68E-03	0.0000	0.667	No

None of the PTEs for non-carcinogenic TAPs were exceeded as a result of this project.

Carcinogenic TAP Emissions

A summary of the estimated PTE for emissions increase of carcinogenic TAPs is provided in the following table.

Table 8 PRE- AND POST PROJECT POTENTIAL TO EMIT FOR CARCINOGENIC TOXIC AIR POLLUTANTS

Carcinogenic Toxic Air Pollutants	Pre-Project Annual Average Emissions Rates for Units at the Facility (lb/hr)	Post Project Annual Average Emissions Rates for Units at the Facility (lb/hr)	Change in Annual Average Emissions Rates for Units at the Facility (lb/hr)	Carcinogenic Screening Emission Level (lb/hr)	Exceeds Screening Level? (Y/N)
Acetaldehyde	2.60E-02	2.60E-02	0.0000	3.0E-03	No
Arsenic	1.61E-05	1.61E-05	0.000000	1.5E-06	No
Benzene	7.91E-03	7.91E-03	0.0000	8.0E-04	No
Beryllium and compounds	1.04E-07	1.04E-07	0.0000000	2.8E-05	No
Cadmium and compounds	9.68E-06	9.68E-06	0.0000000	3.7E-06	No
Chromium (VI)	9.92E-06	9.92E-06	0.000000	5.6E-07	No
Dichloromethane	2.47E-06	2.47E-06	0.000000	1.6E-03	No
Formaldehyde	6.42E-02	6.42E-02	0.0000	5.1E-04	No
Nickel	1.58E-03	1.58E-03	0.0000	2.7E-05	No
PAHs Total	1.87E-02	1.87E-02	0.0000	9.1E-05	No
POM Total[(a)]	3.40E-05	3.40E-05	**0.000000**	2.0E-06	No
Tetrachloroethylene	2.40E-05	2.40E-05	0.0000	1.3E-02	No

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

None of the PTEs for carcinogenic TAPs were exceeded as a result of this project.

Post Project HAP Emissions

The following table presents the post project potential to emit for hazardous air pollutants (HAPs) 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 9 POTENTIAL TO EMIT FOR HAZARDOUS AIR POLLUTANTS EMISSIONS

IDAPA Listing	Hazardous Air Pollutants	PTE (T/yr)
585	Dioxins	1.02E-08
	Furans	1.43E-08
	Acrolein	2.47E-03
	Antimony	1.02E-04
	Barium	5.50E-04
	Chromium	4.95E-04
	Cobalt	1.01E-04
	Copper	3.00E-04
	Ethyl benzene	2.10E-02
	Hexane	8.05E-02
	Manganese	7.23E-04
	Methyl chloroform	4.20E-03
	Methyl ethyl ketone (MEK)	1.75E-03
	Molybdenum	1.29E-05
	Naphthalene	5.89E-02
	Pentane	1.84E-02
	Phosphorus	2.61E-03
	Propionaldehyde	1.14E-02
	Quinone	1.40E-02
	Selenium	4.18E-05
	Silver	4.20E-05
	Thallium	3.59E-07
	Toluene	2.58E-01
	Vanadium	5.22E-04
	Xylene	2.02E-02
	Zinc	5.82E-03
586	Acetaldehyde	1.15E-01
	Arsenic	7.07E-05
	Benzene	4.49E-02
	Benzo(a)anthracene	2.79E-05
	Benzo(a)pyrene	4.29E-06
	Benzo(b)fluoranthene	2.45E-05
	Benzo(k)fluoranthene	6.49E-06
	Beryllium	4.56E-07
	1,3-Butadiene	4.00E-05
	Cadmium	4.24E-05
	Chrysene	3.54E-05
	Dibenzo(a,h)anthracene	4.96E-06
	Formaldehyde	2.74E-01
	Hexavalent Chromium	4.34E-05
	Indeno(1,2,3-cd)pyrene	6.21E-06
	3-Methylchloranthrene	0.00E+00
	Nickel	6.90E-03
Not listed	Acenaphthene	1.92E-04
	Acenaphthylene	2.05E-03
	Anthracene	2.92E-04
	Benzo(e)pyrene	9.63E-06
	Benzo(g,h,l)perylene	1.10E-05
	Dichlorobenzene	0.00E+00
	Fluoranthene	1.13E-04
	Fluorene	1.15E-03
	Isooctane	3.50E-03
	Mercury	2.29E-04
	2-Methylnaphthalene	1.49E-02
	Perylene	7.70E-07
	Phenanthrene	2.64E-03
	Pyrene	3.15E-04
	Total	**0.97**

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

Ambient Air Quality Impact Analyses

As presented in the Modeling Memo in Appendix B, the estimated emission rates of PM10, PM2.5, SO2, NOX, HAP, and TAP from this project exceeded applicable screening emission levels (EL) and published DEQ modeling thresholds established in IDAPA 58.01.01.585-586 and in the State of Idaho Air Quality Modeling Guideline. Refer to the Emissions Inventories section for additional information concerning the emission inventories.

The ambient air impact analyses and other air quality analyses performed in support of the PTC application demonstrated to DEQ's satisfaction that emissions from the co-located Dixie River HMA, CBP, and rock crushing plant, when operating at the Dixie River site as described in the Modeling Memo in Appendix B will not cause or significantly contribute to a violation of any ambient air quality standard.

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

REGULATORY ANALYSIS

Attainment Designation (40 CFR 81.313)

This modeling analysis for this facility demonstrates compliance with applicable standards in attainment areas. However, because a separate modeling analysis was not provided to demonstrate compliance with applicable standards in non-attainment areas, this portable facility is not permitted for operation in non-attainment areas. This requirement is assured by Permit Condition 2.6.

Facility Classification

The AIRS/AFS facility classification codes are as follows:

For HAPs (Hazardous Air Pollutants) Only:

A = Use when any one HAP has permitted emissions > 10 T/yr or if the aggregate of all HAPS (Total HAPs) has permitted emissions > 25 T/yr.

SM80 = Use if a synthetic minor (uncontrolled HAPs emissions are > 10 T/yr or if the aggregate of all uncontrolled HAPs (Total HAPs) emissions are > 25 T/yr and permitted emissions fall below applicable major source thresholds) and the permit sets limits > 8 T/yr of a single HAP or ≥ 20 T/yr of Total HAPs.

SM = Use if a synthetic minor (uncontrolled HAPs emissions are > 10 T/yr or if the aggregate of all uncontrolled HAPs (Total HAPs) emissions are > 25 T/yr and permitted emissions fall below applicable major source thresholds) and the permit sets limits < 8 T/yr of a single HAP and/or < 20 T/yr of Total HAPs.

B = Use when the potential to emit (i.e. uncontrolled emissions and permitted emissions) are below the 10 and 25 T/yr HAP major source thresholds.

UNK = Class is unknown.

For All Other Pollutants:

A = Use when permitted emissions of a pollutant are > 100 T/yr.

SM80 = Use if a synthetic minor for the applicable pollutant (uncontrolled emissions are > 100 T/yr and permitted emissions fall below 100 T/yr) and permitted emissions of the pollutant are ≥ 80 T/yr.

SM = Use if a synthetic minor for the applicable pollutant (uncontrolled emissions are > 100 T/yr and permitted emissions fall below 100 T/yr) and permitted emissions of the pollutant are < 80 T/yr.

B = Use when the potential to emit (i.e. uncontrolled emissions and permitted emissions) are below the 100 T/yr major source threshold.

UNK = Class is unknown.

Table 10 Regulated Air Pollutant Facility Classification

Pollutant	Uncontrolled PTE (T/yr)	Permitted PTE (T/yr)	Major Source Thresholds (T/yr)	AIRS/AFS Classification
PM	9.28	2.37	**100**	B
PM_{10}	9.28	2.37	**100**	B
$PM_{2.5}$	9.28	2.37	**100**	B
SO_2	33.46	7.93	**100**	B
NO_X	27.39	8.99	**100**	B
CO	69.55	23.28	**100**	B
VOC	14.44	4.09	**100**	B
HAP (single)	1.09	0.27	**10**	B
Total HAPs	3.81	0.97	**25**	B

Permit to Construct (IDAPA 58.01.01.201)

IDAPA 58.01.01.201…………………………... Permit to Construct Required

The permittee has requested that a PTC be issued to the facility for the proposed new emissions source. 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 assured by Permit Conditions 3.5 and 4.4.

Fugitive Emissions (IDAPA 58.01.01.650)

IDAPA 58.01.01.650……………………………Rules for the Control of Fugitive Emissions

The sources of fugitive emissions at this facility are subject to the State of Idaho fugitive emissions standards. These requirements are assured by Permit Conditions 2.1, 2.2, and 2.8.

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

IDAPA 58.01.01.701…………………………... Particulate Matter – New Equipment Process Weight Limitations

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

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

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

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

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

- IDAPA 58.01.01.702.01.a: If PW is < 17,000 lb/hr; $E = 0.045\ (PW)^{0.60}$
- IDAPA 58.01.01.702.01.b: If PW is ≥ 17,000 lb/hr; $E = 1.12\ (PW)^{0.27}$

For the new asphalt drum mixer emissions unit proposed to be installed as a result of this project with a proposed throughput of 150 T/hr, E is calculated as follows:

- Proposed throughput = 150 T/hr x 2,000 lb/1 T = 300,000 lb/hr

Therefore, E is calculated as:

- $E = 1.10 \times PW^{0.25} = 1.10 \times (300{,}000)^{0.25} = 25.7$ lb-PM/hr

As presented previously in the Emissions Inventories Section of this evaluation the post project PTE for this emissions unit is 3.94 lb-PM10/PM2.5 per hour. Assuming PM is 50% PM10/PM2.5 means that PM emissions will be 7.88 lb-PM/hr (3.94 lb- PM10/PM2.5 per hour ÷ 0.5 lb-PM10/PM2.5 per lb-PM). This is less than the calculated Rule requirement PM emissions rate of 25.7 lb-PM/hr. Therefore, compliance with this requirement has been demonstrated.

Rules for Control of Odors (IDAPA 58.01.01.775)

IDAPA 58.01.01.750…………………………... Rules for Control of Odors

Section 776.01 states that no person shall allow, suffer, cause, or permit the emission of odorous gases, liquids, or solids into the atmosphere in such quantities as to cause air pollution. These requirements are assured by Permit Conditions 2.7 and 2.11.

Rules for Control of Hot-Mix Asphalt Plants (IDAPA 58.01.01.805)

IDAPA 58.01.01.805…………………………... Rules for Control of Hot-Mix Asphalt Plants

The purpose of Sections 805 through 808 is to establish for hot-mix asphalt plants restrictions on the emission of particulate matter.

Section 806 states that no person shall cause, allow or permit a hot-mix asphalt plant to have particulate emissions which exceed the limits specified in Sections 700 through 703. As demonstrated previously, these requirements have been met by the proposed PM_{10} emissions rate (see Section on Particulate Matter – New Equipment Process Weight Limitations).

Section 807 states that in the case of more than one stack to a hot-mix asphalt plant, the emission limitation will be based on the total emission from all stacks. The proposed facility only has one stack for emissions from the asphalt drum dryer so there is no need to combine emissions limits from multiple stacks into one stack as required.

Section 808.01 requires fugitive emission controls as follows: 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.

Section 808.02 requires plant property dust controls as follows: 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 Permit Conditions 2.1 and 2.2.

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 (list pollutants, i.e., PM_{10}, SO_2, NO_X, CO, VOC, and HAP) or 10 tons per year for any one HAP or 25 tons per year for all HAP combined (list HAP or HAPs) as demonstrated previously in the Emissions Inventories Section of this analysis. Therefore, the facility is not a Tier I source in accordance with IDAPA 58.01.01.006 and the requirements of IDAPA 58.01.01.301 do not apply.

PSD Classification (40 CFR 52.21)

40 CFR 52.21…………………………………... Prevention of Significant Deterioration of Air Quality

The facility is not a major stationary source as defined in 40 CFR 52.21(b)(1), nor is it undergoing any physical change at a stationary source not otherwise qualifying under paragraph 40 CFR 52.21(b)(1) as a major stationary source, that would constitute a major stationary source by itself as defined in 40 CFR 52. Therefore in accordance with 40 CFR 52.21(a)(2), PSD requirements are not applicable to this permitting action. The facility is 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.

Non-road Engine (40 CFR 1068)

40 CFR 1068…………………………………… General Compliance Provisions for Highway, Stationary, and Nonroad Programs

40 CFR 1068.30 defines a non-road engine is an internal combustion engine that is by itself or in or on a piece of equipment, it is portable or transportable, meaning designed to be and capable of being carried or moved from one location to another. Indicia of transportability include, but are not limited to, wheels, skids, carrying handles, dolly, trailer, or platform.

An IC engine is not a non-road engine if it will remain at a location for more than 12 consecutive months or a shorter period of time for an engine located at a seasonal source. A location is any single site at a building, structure, facility, or installation. For any engine (or engines) that replaces an engine at a location and that is intended to perform the same or similar function as the engine replaced, include the time period of both engines in calculating the consecutive time period. An engine located at a seasonal source is an engine that remains at a seasonal source during the full annual operating period of the seasonal source. A seasonal source is a stationary source that remains in a single location on a permanent basis (*i.e.*, at least two years) and that operates at that single location approximately three months (or more) each year. See §1068.31 for provisions that apply if the engine is removed from the location.

For this project the facility has proposed a compression ignition IC engine that meets the definition of a non-road engine. Note: If the IC engine remains at a site for more than12 months, the facility shall submit an application for a PTC modification to permit the engine as stationary source IC engine.

This requirement is assured by Permit Condition 2.5.

NSPS Applicability (40 CFR 60)

Because the facility produces asphalt and has two compression ignition IC engines the following NSPS Subparts are applicable:

- 40 CFR 60, Subpart I - National Standards of Performance for Hot Mix Asphalt Plants
- 40 CFR 60, Subpart IIII - Standards of Performance for Stationary Compression Ignition Internal Combustion Engines

DEQ has been delegated authority to this subpart.

Those sections that are applicable are highlighted.

40 CFR 60, Subpart I — **National Standards of Performance for Hot Mix Asphalt Plants**

This permitting action is for a new asphalt plant. Therefore, the requirements of this subpart may apply.

§ 60.90…………………………Applicability and designation of affected facility

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

The affected facility includes: the dryer; 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.

§ 60.91…………………………Definitions

This section contains the definitions of this subpart.

§ 60.92…………………………Standard for particulate matter

In accordance with §60.92, no owner or operator shall discharge or cause the discharge into the atmosphere from any affected facility any gases which contain particulate matter in excess of 0.04 gr/dscf or exhibit 20% opacity or greater. Permit Condition 3.4 includes the requirements of this section.

§ 60.93…………………………Test methods and procedures

In accordance with §60.93(a), performance tests shall use as reference methods and procedures the test methods in Appendix A of 40 CFR 60.

In accordance with §60.93(b), compliance with the particulate matter standards shall be determined by EPA Reference Method 5, and opacity shall be determined by EPA Reference Method 9. Permit Conditions 3.15 and 3.16 includes the requirements of this section.

DEQ has been delegated authority to this subpart.

40 CFR 60, Subpart IIII — **Standards of Performance for Stationary Compression Ignition Internal Combustion Engines**

This permitting action is for a new asphalt plant. Included in the proposed permitted equipment are two diesel-fired IC engines, the Primary IC Engine and the Secondary IC Engine. Therefore, the requirements of this subpart may apply.

§ 60.4200………………………Am I subject to this subpart?

(a) The provisions of this subpart are applicable to manufacturers, owners, and operators of stationary compression ignition (CI) internal combustion engines (ICE) as specified in paragraphs (a)(1) through (3) of this section. For the purposes of this subpart, the date that construction commences is the date the engine is ordered by the owner or operator.

(1) Manufacturers of stationary CI ICE with a displacement of less than 30 liters per cylinder where the model year is:

(i) 2007 or later, for engines that are not fire pump engines,

(ii) The model year listed in table 3 to this subpart or later model year, for fire pump engines.

(2) Owners and operators of stationary CI ICE that commence construction after July 11, 2005, where the stationary CI ICE are:

(i) Manufactured after April 1, 2006, and are not fire pump engines, or

(ii) Manufactured as a certified National Fire Protection Association (NFPA) fire pump engine after July 1, 2006.

(3) Owners and operators of stationary CI ICE that modify or reconstruct their stationary CI ICE after July 11, 2005.

(4) The provisions of §60.4208 of this subpart are applicable to all owners and operators of stationary CI ICE that commence construction after July 11, 2005.

(b) The provisions of this subpart are not applicable to stationary CI ICE being tested at a stationary CI ICE test cell/stand.

(c) If you are an owner or operator of an area source subject to this subpart, you are exempt from the obligation to obtain a permit under 40 CFR part 70 or 40 CFR part 71, provided you are not required to obtain a permit under 40 CFR 70.3(a) or 40 CFR 71.3(a) for a reason other than your status as an area source under this subpart. Notwithstanding the previous sentence, you must continue to comply with the provisions of this subpart applicable to area sources.

(d) Stationary CI ICE may be eligible for exemption from the requirements of this subpart as described in 40 CFR part 1068, subpart C (or the exemptions described in 40 CFR part 89, subpart J and 40 CFR part 94, subpart J, for engines that would need to be certified to standards in those parts), except that owners and operators, as well as manufacturers, may be eligible to request an exemption for national security.

(e) Owners and operators of facilities with CI ICE that are acting as temporary replacement units and that are located at a stationary source for less than 1 year and that have been properly certified as meeting the standards that would be applicable to such engine under the appropriate nonroad engine provisions, are not required to meet any other provisions under this subpart with regard to such engines.

This facility includes the installation of two CI stationary at a facility that will be constructed after July 11, 2005, that were manufactured after April 1, 2006, and that are not fire pump engines.

§ 60.4201………………………Emissions Standards for Manufacturers

This Section of the Subpart applies to manufacturers of IC engines. However, the Applicant is not a manufacturer of the IC engines proposed for this project. Therefore, the requirements of this Section of the Subpart are not applicable.

§ 60.4202………………………What emission standards must I meet for emergency engines if I am a stationary CI internal combustion engine manufacturer?

This Section of the Subpart applies to manufacturers of IC engines. However, as discussed previously, the Applicant is not a manufacturer of the IC engines proposed for this project. Therefore, the requirements of this Section of the Subpart are not applicable.

§ 60.4203………………………How long must my engines meet the emission standards if I am a manufacturer of stationary CI internal combustion engines?

Engines manufactured by stationary CI internal combustion engine manufacturers must meet the emission standards as required in §§60.4201 and 60.4202 during the certified emissions life of the engines.

This Section of the Subpart applies to manufacturers of IC engines. However, as discussed previously, the Applicant is not a manufacturer of the IC engines proposed for this project. Therefore, the requirements of this Section of the Subpart are not applicable.

§ 60.4204………………………What emission standards must I meet for non-emergency engines if I am an owner or operator of a stationary CI internal combustion engine?

(a) Owners and operators of pre-2007 model year non-emergency stationary CI ICE with a displacement of less than 10 liters per cylinder must comply with the emission standards in table 1 to this subpart. Owners and operators of pre-2007 model year non-emergency stationary CI ICE with a displacement of greater than or equal to 10 liters per cylinder and less than 30 liters per cylinder must comply with the emission standards in 40 CFR 94.8(a)(1).

(b) Owners and operators of 2007 model year and later non-emergency stationary CI ICE with a displacement of less than 30 liters per cylinder must comply with the emission standards for new CI engines in §60.4201 for their 2007 model year and later stationary CI ICE, as applicable.

The Subpart requires that the Permittee comply with Table 1 of IIII if the engine is pre-2007 and has a displacement of less than 10 liters/cylinder. By installing Tier certified 2007 or later model year IC engines, as proposed by the Applicant, the emissions requirements of this Section of the Subpart have been met. These requirements are assured by Permit Conditions 4.5 and 4.6.

§ 60.4205……………………… What emission standards must I meet for emergency engines if I am an owner or operator of a stationary CI internal combustion engine?

Emergency stationary CI internal combustion engines must meet the emission standards as required in §§60.4205.

This Section of the Subpart applies to emergency IC engines. However, this application if for full-time IC engines, not emergency IC engines. Therefore, the requirements of this Section of the Subpart are not applicable.

§ 60.4206……………………… How long must my engines meet the emission standards if I am an owner or operator of a stationary CI internal combustion engine?

Owners and operators of stationary CI ICE must operate and maintain stationary CI ICE that achieve the emission standards as required in §§60.4204 and 60.4205 over the entire life of the engine.

This requirement is assured by Permit Condition 4.11.

§ 60.4207……………………… What fuel requirements must I meet if I am an owner or operator of a stationary CI internal combustion engine subject to this subpart?

(a) Beginning October 1, 2007, owners and operators of stationary CI ICE subject to this subpart that use diesel fuel must use diesel fuel that meets the requirements of 40 CFR 80.510(a).

(b) Beginning October 1, 2010, owners and operators of stationary CI ICE subject to this subpart with a displacement of less than 30 liters per cylinder that use diesel fuel must purchase diesel fuel that meets the requirements of 40 CFR 80.510(b) for nonroad diesel fuel.

(c) [Reserved]

(d) Beginning June 1, 2012, owners and operators of stationary CI ICE subject to this subpart with a displacement of greater than or equal to 30 liters per cylinder are no longer subject to the requirements of paragraph (a) of this section, and must use fuel that meets a maximum per-gallon sulfur content of 1,000 parts per million (ppm).

(e) Stationary CI ICE that have a national security exemption under §60.4200(d) are also exempt from the fuel requirements in this section.

The Applicant has stated that they will fuel the IC engines with diesel fuel with a maximum sulfur content of 15 ppm or 0.0015% by weight which meets the requirements of this Section of the Subpart. This requirement is assured by Permit Condition 4.10.

§ 60.4208……………………… What is the deadline for importing or installing stationary CI ICE produced in previous model years?

(a) After December 31, 2008, owners and operators may not install stationary CI ICE (excluding fire pump engines) that do not meet the applicable requirements for 2007 model year engines.

(b) After December 31, 2009, owners and operators may not install stationary CI ICE with a maximum engine power of less than 19 KW (25 HP) (excluding fire pump engines) that do not meet the applicable requirements for 2008 model year engines.

(c) After December 31, 2014, owners and operators may not install non-emergency stationary CI ICE with a maximum engine power of greater than or equal to 19 KW (25 HP) and less than 56 KW (75 HP) that do not meet the applicable requirements for 2013 model year non-emergency engines.

(d) After December 31, 2013, owners and operators may not install non-emergency stationary CI ICE with a maximum engine power of greater than or equal to 56 KW (75 HP) and less than 130 KW (175 HP) that do not meet the applicable requirements for 2012 model year non-emergency engines.

(e) After December 31, 2012, owners and operators may not install non-emergency stationary CI ICE with a maximum engine power of greater than or equal to 130 KW (175 HP), including those above 560 KW (750 HP), that do not meet the applicable requirements for 2011 model year non-emergency engines.

(f) After December 31, 2016, owners and operators may not install non-emergency stationary CI ICE with a maximum engine power of greater than or equal to 560 KW (750 HP) that do not meet the applicable requirements for 2015 model year non-emergency engines.

(g) After December 31, 2018, owners and operators may not install non-emergency stationary CI ICE with a maximum engine power greater than or equal to 600 KW (804 HP) and less than 2,000 KW (2,680 HP) and a displacement of greater than or equal to 10 liters per cylinder and less than 30 liters per cylinder that do not meet the applicable requirements for 2017 model year non-emergency engines.

(h) In addition to the requirements specified in §§60.4201, 60.4202, 60.4204, and 60.4205, it is prohibited to import stationary CI ICE with a displacement of less than 30 liters per cylinder that do not meet the applicable requirements specified in paragraphs (a) through (g) of this section after the dates specified in paragraphs (a) through (g) of this section.

(i) The requirements of this section do not apply to owners or operators of stationary CI ICE that have been modified, reconstructed, and do not apply to engines that were removed from one existing location and reinstalled at a new location.

For the Primary IC Engine the Applicant has proposed to install a 2014 model Tier certified 4 engine that meets the applicable requirements of this Section of the Subpart for that model year IC engine. In addition, for the Secondary IC Engine the Applicant has proposed to install a 2006 model Tier certified 2 engine that meets the applicable requirements of this Section of the Subpart for that model year IC engine. These requirements are assured by Permit Condition 4.5 and 4.6.

§ 60.4209……………………… What are the monitoring requirements if I am an owner or operator of a stationary CI internal combustion engine?

If you are an owner or operator, you must meet the monitoring requirements of this section. In addition, you must also meet the monitoring requirements specified in §60.4211.

(a) If you are an owner or operator of an emergency stationary CI internal combustion engine that does not meet the standards applicable to non-emergency engines, you must install a non-resettable hour meter prior to startup of the engine.

(b) If you are an owner or operator of a stationary CI internal combustion engine equipped with a diesel particulate filter to comply with the emission standards in §60.4204, the diesel particulate filter must be installed with a backpressure monitor that notifies the owner or operator when the high backpressure limit of the engine is approached.

The Applicant has not proposed an emergency IC engine. Therefore, the hour meter is not required. In addition, the Applicant has not proposed to install an IC engine with a diesel particulate filter. Therefore, the back pressure monitor is not required.

§ 60.4210……………………… What are my compliance requirements if I am a stationary CI internal combustion engine manufacturer?

This Section of the Subpart applies to manufacturers of IC engines. However, as discussed previously, the Applicant is not a manufacturer of the IC engines proposed for this project. Therefore, the requirements of this Section of the Subpart are not applicable.

§ 60.4211……………………… What are my compliance requirements if I am an owner or operator of a stationary CI internal combustion engine?

(a) If you are an owner or operator and must comply with the emission standards specified in this subpart, you must do all of the following, except as permitted under paragraph (g) of this section:

(1) Operate and maintain the stationary CI internal combustion engine and control device according to the manufacturer's emission-related written instructions;

(2) Change only those emission-related settings that are permitted by the manufacturer; and

(3) Meet the requirements of 40 CFR parts 89, 94 and/or 1068, as they apply to you.

(b) If you are an owner or operator of a pre-2007 model year stationary CI internal combustion engine and must comply with the emission standards specified in §§60.4204(a) or 60.4205(a), or if you are an owner or operator of a CI fire pump engine that is manufactured prior to the model years in table 3 to this subpart and must comply with the emission standards specified in §60.4205(c), you must demonstrate compliance according to one of the methods specified in paragraphs (b)(1) through (5) of this section.

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

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

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

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

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

(c) If you are an owner or operator of a 2007 model year and later stationary CI internal combustion engine and must comply with the emission standards specified in §60.4204(b) or §60.4205(b), or if you are an owner or operator of a CI fire pump engine that is manufactured during or after the model year that applies to your fire pump engine power rating in table 3 to this subpart and must comply with the emission standards specified in §60.4205(c), you must comply by purchasing an engine certified to the emission standards in §60.4204(b), or §60.4205(b) or (c), as applicable, for the same model year and maximum (or in the case of fire pumps, NFPA nameplate) engine power. The engine must be installed and configured according to the manufacturer's emission-related specifications, except as permitted in paragraph (g) of this section.

(d) If you are an owner or operator and must comply with the emission standards specified in §60.4204(c) or §60.4205(d), you must demonstrate compliance according to the requirements specified in paragraphs (d)(1) through (3) of this section.

(1) Conducting an initial performance test to demonstrate initial compliance with the emission standards as specified in §60.4213.

(2) Establishing operating parameters to be monitored continuously to ensure the stationary internal combustion engine continues to meet the emission standards. The owner or operator must petition the Administrator for approval of operating parameters to be monitored continuously. The petition must include the information described in paragraphs (d)(2)(i) through (v) of this section.

(i) Identification of the specific parameters you propose to monitor continuously;

(ii) A discussion of the relationship between these parameters and NO_X and PM emissions, identifying how the emissions of these pollutants change with changes in these parameters, and how limitations on these parameters will serve to limit NO_X and PM emissions;

(iii) A discussion of how you will establish the upper and/or lower values for these parameters which will establish the limits on these parameters in the operating limitations;

(iv) A discussion identifying the methods and the instruments you will use to monitor these parameters, as well as the relative accuracy and precision of these methods and instruments; and

(v) A discussion identifying the frequency and methods for recalibrating the instruments you will use for monitoring these parameters.

(3) For non-emergency engines with a displacement of greater than or equal to 30 liters per cylinder, conducting annual performance tests to demonstrate continuous compliance with the emission standards as specified in §60.4213.

(e) If you are an owner or operator of a modified or reconstructed stationary CI internal combustion engine and must comply with the emission standards specified in §60.4204(e) or §60.4205(f), you must demonstrate compliance according to one of the methods specified in paragraphs (e)(1) or (2) of this section.

(1) Purchasing, or otherwise owning or operating, an engine certified to the emission standards in §60.4204(e) or §60.4205(f), as applicable.

(2) Conducting a performance test to demonstrate initial compliance with the emission standards according to the requirements specified in §60.4212 or §60.4213, as appropriate. The test must be conducted within 60 days after the engine commences operation after the modification or reconstruction.

(f) Emergency stationary ICE may be operated for the purpose of maintenance checks and readiness testing, provided that the tests are recommended by Federal, State or local government, the manufacturer, the vendor, or the insurance company associated with the engine. Maintenance checks and readiness testing of such units is limited to 100 hours per year. There is no time limit on the use of emergency stationary ICE in emergency situations. The owner or operator may petition the Administrator for approval of additional hours to be used for maintenance checks and readiness testing, but a petition is not required if the owner or operator maintains records indicating that Federal, State, or local standards require maintenance and testing of emergency ICE beyond 100 hours per year. Emergency stationary ICE may operate up to 50 hours per year in non-emergency situations, but those 50 hours are counted towards the 100 hours per year provided for maintenance and testing. The 50 hours per year for non-emergency situations cannot be used for peak shaving or to generate income for a facility to supply power to an electric grid or otherwise supply non-emergency power as part of a financial arrangement with another entity. For owners and operators of emergency engines, any operation other than emergency operation, maintenance and testing, and operation in non-emergency situations for 50 hours per year, as permitted in this section, is prohibited.

(g) If you do not install, configure, operate, and maintain your engine and control device according to the manufacturer's emission-related written instructions, or you change emission-related settings in a way that is not permitted by the manufacturer, you must demonstrate compliance as follows:

(1) If you are an owner or operator of a stationary CI internal combustion engine with maximum engine power less than 100 HP, you must keep a maintenance plan and records of conducted maintenance to demonstrate compliance and must, to the extent practicable, maintain and operate the engine in a manner consistent with good air pollution control practice for minimizing emissions. In addition, if you do not install and configure the engine and control device according to the manufacturer's emission-related written instructions, or you change the emission-related settings in a way that is not permitted by the manufacturer, you must conduct an initial performance test to demonstrate compliance with the applicable emission standards within 1 year of such action.

(2) If you are an owner or operator of a stationary CI internal combustion engine greater than or equal to 100 HP and less than or equal to 500 HP, you must keep a maintenance plan and records of conducted maintenance and must, to the extent practicable, maintain and operate the engine in a manner consistent with good air pollution control practice for minimizing emissions. In addition, you must conduct an initial performance test to demonstrate compliance with the applicable emission standards within 1 year of startup, or within 1 year after an engine and control device is no longer installed, configured, operated, and maintained in accordance with the manufacturer's emission-related written instructions, or within 1 year after you change emission-related settings in a way that is not permitted by the manufacturer.

(3) If you are an owner or operator of a stationary CI internal combustion engine greater than 500 HP, you must keep a maintenance plan and records of conducted maintenance and must, to the extent practicable, maintain and operate the engine in a manner consistent with good air pollution control practice for minimizing emissions. In addition, you must conduct an initial performance test to demonstrate compliance with the applicable emission standards within 1 year of startup, or within 1 year after an engine and control device is no longer installed, configured, operated, and maintained in accordance with the manufacturer's emission-related written instructions, or within 1 year after you change emission-related settings in a way that is not permitted by the manufacturer. You must conduct subsequent performance testing every 8,760 hours of engine operation or 3 years, whichever comes first, thereafter to demonstrate compliance with the applicable emission standards.

By installing Tier certified 2007 or later model year IC engines, as proposed by the Applicant, the emissions requirements of this Section of the Subpart have been met. These requirements are assured by Permit Conditions 4.5 and 4.6.

§ 60.4214……………………… What are my notification, reporting, and recordkeeping requirements if I am an owner or operator of a stationary CI internal combustion engine?

(a) Owners and operators of non-emergency stationary CI ICE that are greater than 2,237 KW (3,000 HP), or have a displacement of greater than or equal to 10 liters per cylinder, or are pre-2007 model year engines that are greater than 130 KW (175 HP) and not certified, must meet the requirements of paragraphs (a)(1) and (2) of this section.

(1) Submit an initial notification as required in §60.7(a)(1). The notification must include the information in paragraphs (a)(1)(i) through (v) of this section.

(i) Name and address of the owner or operator;

(ii) The address of the affected source;

(iii) Engine information including make, model, engine family, serial number, model year, maximum engine power, and engine displacement;

(iv) Emission control equipment; and

(v) Fuel used.

(2) Keep records of the information in paragraphs (a)(2)(i) through (iv) of this section.

(i) All notifications submitted to comply with this subpart and all documentation supporting any notification.

(ii) Maintenance conducted on the engine.

(iii) If the stationary CI internal combustion is a certified engine, documentation from the manufacturer that the engine is certified to meet the emission standards.

(iv) If the stationary CI internal combustion is not a certified engine, documentation that the engine meets the emission standards.

(b) If the stationary CI internal combustion engine is an emergency stationary internal combustion engine, the owner or operator is not required to submit an initial notification. Starting with the model years in table 5 to this subpart, if the emergency engine does not meet the standards applicable to non-emergency engines in the applicable model year, the owner or operator must keep records of the operation of the engine in emergency and non-emergency service that are recorded through the non-resettable hour meter. The owner must record the time of operation of the engine and the reason the engine was in operation during that time.

(c) If the stationary CI internal combustion engine is equipped with a diesel particulate filter, the owner or operator must keep records of any corrective action taken after the backpressure monitor has notified the owner or operator that the high backpressure limit of the engine is approached

The IC engines proposed to be installed by the Applicant are Tier certified 2007 or later model year IC engines. Therefore, the requirements of this Section of the Subpart are not applicable.

§ 60.4218………………………What parts of the General Provisions apply to me?

Table 8 to this subpart shows which parts of the General Provisions in §§60.1 through 60.19 apply to you.

These requirements are assured by Permit Condition 4.18.

NESHAP Applicability (40 CFR 61)

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

MACT Applicability (40 CFR 63)

Because the facility has two compression ignition IC engines the following NESHAP Subpart may be applicable:

- 40 CFR 60, Subpart ZZZZ - National Emission Standard for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines

However, as discussed previously in the NSPS Applicability (40 CFR 60) section, Subpart IIII applies to the two proposed Tier certified IC engines. Therefore, the requirements of NESHAP Subpart ZZZZ do not apply to the two IC engines proposed for this project.

Permit Conditions Review

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

Facility-Wide Conditions

Permit Condition 2.3 establishes that the asphalt plant shall not locate within 1,000 feet (±6 feet) of a rock crushing plant or a concrete batch plant except with the concrete batch plant (Facility ID 027-00176) located at 22027 Weitz Road, Caldwell, Idaho permitted under P-2018.0021.

Permit Condition 2.5 establishes that if the asphalt plant is not located with the concrete batch plant (Facility ID 027-00176) at 22027 Weitz Road, Caldwell, Idaho, permitted under P-2018.0021,the permittee shall relocate the permitted HMA production equipment to a different aggregate pit or storage area at least once every 12 months.

Asphalt Production Equipment

Permit Condition 3.9 establishes that the permittee does not need to maintain the setback distances when the asphalt plant is co-located with the concrete batch plant (Facility ID 027-00176) located at 22027 Weitz Road, Caldwell, Idaho.

Internal Combustion Engines

Permit Condition 4.7 establishes that the Primary and Secondary IC engines shall not be allowed to operate when the asphalt plant is co-located with the concrete batch plant located at 22027 Weitz Road, Caldwell, Idaho.

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 – EMISSION INVENTORIES

Facility:	Dixie River dba River Rock Sand & Gravel 00586
3/3/2020 14:06	Permit/Facility ID: P-2018.0029 777-00586

Silo Filling Operations AP-42 Section 11.1

Emissions Toggle =	1	
Max Hourly Production	150	T/hr
Max Daily Production	1,800	Tons/day
Max Annual Production	175,000	Tons/yr

Pollutant	Emission Factor[a] Silo Fill (lb/ton)	Emissions (lb/hr) 1-hr Average	Emissions (T/yr)	TAPs Emissions (lb/hr) **Annual** or 24-hr Average
PM (total) [b]	5.86E-04	0.0879	0.0513	
PM-10 (total) [b]	5.86E-04	0.0879	0.0513	
PM-2.5 [b]	5.86E-04	0.0879	0.0513	
CO [b]	1.18E-03	0.1770	0.1032	
NOx				
SO_2				
VOC [d,g]	1.22E-04	1.83E-02	0.0107	
Lead				
HCl [d,e]	No Data			
Dioxins[e]				
2,3,7,8-TCDD				
Total TCDD				
1,2,3,7,8-PeCDD				
Total PeCDD				
1,2,3,4,7,8-HxCDD				
1,2,3,6,7,8-HxCDD				
1,2,3,7,8,9-HxCDD				
Total HxCDD				
1,2,3,4,6,7,8-Hp-CDD				
Total HpCDD				
Octa CDD				
Total PCDD[h]				
Furans[e]				
2,3,7,8-TCDF				
Total TCDF				
1,2,3,7,8-PeCDF				
2,3,4,7,8-PeCDF				
Total PeCDF				
1,2,3,4,7,8-HxCDF				
1,2,3,6,7,8-HxCDF				
2,3,4,6,7,8-HxCDF				
1,2,3,7,8,9-HxCDF				
Total HxCDF				
1,2,3,4,6,7,8-HpCDF				
1,2,3,4,7,8,9-HpCDF				
Total HpCDF				
Octa CDF				
Total PCDF[h]				
Total PCDD/PCDF[h]				
Non-PAH HAPs				
Acetaldehyde[e]				
Acrolein[e]				
Benzene[e]	3.90E-06	5.85E-04	3.41E-04	0.0001
1,3-Butadiene[e]				
Ethylbenzene[e]	4.63E-06	6.95E-04	4.05E-04	3.47E-04
Formaldehyde[e]	8.41E-05	1.26E-02	7.36E-03	0.0017
Hexane[e]	1.22E-05	1.83E-03	1.07E-03	9.14E-04
Isooctane	3.78E-08	5.67E-06	3.31E-06	2.83E-06
Methyl Ethyl Ketone[e]	4.75E-06	7.13E-04	4.16E-04	3.56E-04
Pentane[e]				
Propionaldehyde[e]				
Quinone[e]				
Methyl chloroform[e]		0.00E+00	0.00E+00	
Toluene[e]	7.56E-06	1.13E-03	6.61E-04	5.67E-04
Xylene[e]	3.13E-05	4.70E-03	2.74E-03	2.35E-03
POM (7-PAH Group)		1.01E-04		**1.35E-05**

Pollutant	Emission Factor[a] Silo Fill (lb/ton)	Emissions (lb/hr) 1-hr Average	Emissions (T/yr)	TAPs Emissions (lb/hr) **Annual** or 24-hr Average
PAH HAPs[f]				
2-Methylnaphthalene	1.34E-05	2.01E-03	1.17E-03	2.67E-04
3-Methylchloranthrene[e]				
Acenaphthene	1.19E-06	1.79E-04	1.04E-04	2.38E-05
Acenaphthylene	3.55E-08	5.33E-06	3.11E-06	7.10E-07
Anthracene	3.30E-07	4.95E-05	2.89E-05	6.59E-06
Benzo(a)anthracene	1.42E-07	2.13E-05	1.24E-05	2.84E-06
Benzo(a)pyrene[e]	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(b)fluoranthene	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(e)pyrene	2.41E-08	3.62E-06	2.11E-06	4.82E-07
Benzo(g,h,I)perylene	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(k)fluoranthene	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chrysene	5.33E-07	8.00E-05	4.67E-05	1.07E-05
Dibenzo(a,h)anthracene	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Dichlorobenzene				
Fluoranthene	3.81E-07	5.71E-05	3.33E-05	7.61E-06
Fluorene	2.56E-06	3.85E-04	2.24E-04	5.12E-05
Indeno(1,2,3-cd)pyrene	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Naphthalene[e]	4.62E-06	6.93E-04	4.04E-04	9.23E-05
Perylene	7.62E-08	1.14E-05	6.66E-06	1.52E-06
Phenanthrene	4.57E-06	6.86E-04	4.00E-04	9.13E-05
Pyrene	1.12E-06	1.68E-04	9.77E-05	2.23E-05
Non-HAP Organic Compounds				
Acetone[e]	6.70E-06	1.01E-03	0.0006	5.03E-04
Benzaldehyde				
Butane				
Butyraldehyde				
Crotonaldehyde[e]				
Ethylene	1.34E-04	2.01E-02	0.0117	1.01E-02
Heptane				
Hexanal				
Isovaleraldehyde				
2-Methyl-1-pentene				
2-Methyl-2-butene				
3-Methylpentane				
1-Pentene				
n-Pentane				
Valeraldehyde				
Metals				
Antimony[e]				
Arsenic[e]				
Barium[e]				
Beryllium[e]				
Cadmium[e]				
Chromium[e]				
Cobalt[e]				
Copper[e]				
Hexavalent Chromium[e]				
Manganese[e]				
Mercury[e]				
Molybdenum[e]				
Nickel[e]				
Phosphorus[e]				
Silver[e]				
Selenium[e]				
Thallium[e]				
Vanadium[e]				
Zinc[e]				

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

b) AP-42, Table 11.1-14, Predictive Emission Factor Equations for Load-Out and Silo Filling Operations, 3/04 Defaults: (-V) = 0.5 T (°F) = 325

Equation		LOADOUT	SILO FILL	
Total PM EF = $0.000181+0.00141(-V)e^{((0.0251)(T+460)-20.43)}$ + $000332+ 0.00105(-V)e^{((0.0251)(T+46}$	=	5.219E-04	5.859E-04	(split addends)
Organic PM EF = $0.00141(-V)e^{((0.0251)(T+460)-20.43)}$ + $0.00105(-V)e^{((0.0251)(T+460)-20.43)}$	=	3.409E-04	2.539E-04	(split addends)
TOC PM EF = $0.0172(-V)e^{((0.0251)(T+460)-20.43)}$ + $0.0504(-V)e^{((0.0251)(T+460)-20.43)}$	=	4.159E-03	1.219E-02	(split addends)
CO PM EF = $0.00558(-V)e^{((0.0251)(T+460)-20.43)}$ + $0.00488(-V)e^{((0.0251)(T+460)-20.43)}$	=	1.349E-03	1.180E-03	(split addends)

e) IDAPA Toxic Air Pollutant

f) AP-42, Table 11.1-15, Speciation Profiles for Load-out, Silo Filling, & Asphalt Storage--Organic Particulate-Based Compounds, 3/04 (EF=Spec% * Organic PM EF)

g) AP-42, Table 11.1-16, Speciation Profiles for Load-out, Silo Filling, &Asphalt Storage--Organic Volatile-Based Compounds, 3/04, (EF=Spec% * TOC PM EF)

Pollutants shown in bold text are carcinogens subject to an annual standard. These lb/hr values are annual averages.

Pollutants shown in blue text are organic volatile-based compounds, EF = Spec% x TOC PM EF.

Facility:	Dixie River dba River Rock Sand & Gravel 00586
3/3/2020 14:06	Permit/Facility ID: P-2018.0029 777-00586

Silo Filling Operations AP-42 Section 11.1, Page 2

Fuel Type Toggle =	1	
Max Hourly Production	150	T/hr
Max Daily Production	1,800	Tons/day
Max Annual Production	175,000	Tons/yr

Pollutant	Emission Factor[a] Silo Fill (lb/ton)	Emissions (lb/hr) 1-hr Average	Emissions (T/yr)	TAPs Emissions (lb/hr) **Annual** or 24-hr Average
non-PAH HAPs[g]				
Bromomethane[e]	5.97E-07	8.96E-05	0.0001	4.48E-05
2-Butanone (see Methyl Ethyl Ketone)				
Carbon disulfide[e]	1.95E-06	2.92E-04	0.0002	1.46E-04
Chloroethane (Ethyl chloride[e])	4.87E-07	7.31E-05	0.0000	3.66E-05
Chloromethane (Methyl chloride[e])	2.80E-06	4.20E-04	0.0002	2.10E-04
Cumene[e]				
n-Hexane (see Hexane[e])				
Methylene chloride (Dichloromethane[e])	3.29E-08	4.94E-06	2.88E-06	2.47E-06
MTBE				
Styrene[e]	6.58E-07	9.87E-05	5.76E-05	4.94E-05
Tetrachloroethene (Tetrachloroethylene[e])	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,1,1-Trichloroethane (Methyl chloroform[e])	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Trichloroethene (Trichloroethylene[e])				
Trichlorofluoromethane				
m-/p-Xylene[e] (added into Xylene[e])	2.44E-05	3.66E-03	0.0021	1.83E-03
o-Xylene[e] (added into Xylene[e])	6.95E-06	1.04E-03	0.0006	5.21E-04
Phenol[e,f]				
Non-HAP Organic Compounds				
Methane	3.17E-03	4.75E-01	0.2772	2.38E-01

Pollutants shown in blue text are organic volatile-based compounds, EF = Spec% x TOC PM EF

Facility: **Dixie River dba River Rock Sand & Gravel 00586**

3/3/2020 14:10 **Permit/Facility ID: P-2018.0029 777-00586**

Load-out Operations AP-42 Section 11.1

Emissions Toggle =	1	
Max Hourly Production	150	T/hr
Max Daily Production	1,800	Tons/day
Max Annual Production	175,000	Tons/yr

Pollutant	Emission Factor[a] Loadout (lb/ton)	Emissions (lb/hr) 1-hr Average	Emissions (T/yr)	TAPs Emissions (lb/hr) **Annual** or 24-hr Average
PM (total) [b]	5.22E-04	0.078	0.05	
PM-10 (total) [b]	5.22E-04	0.078	0.05	
PM-2.5 [b]	5.22E-04	0.078	0.05	
CO [b]	1.35E-03	0.202	0.12	
NOx				
SO_2				
VOC [d,g]	3.91E-03	0.586	0.34	
Lead				
HCl [d,e]	No Data			
Dioxins[e]				
2,3,7,8-TCDD				
Total TCDD				
1,2,3,7,8-PeCDD				
Total PeCDD				
1,2,3,4,7,8-HxCDD				
1,2,3,6,7,8-HxCDD				
1,2,3,7,8,9-HxCDD				
Total HxCDD				
1,2,3,4,6,7,8-Hp-CDD				
Total HpCDD				
Octa CDD				
Total PCDD[h]				
Furans[e]				
2,3,7,8-TCDF				
Total TCDF				
1,2,3,7,8-PeCDF				
2,3,4,7,8-PeCDF				
Total PeCDF				
1,2,3,4,7,8-HxCDF				
1,2,3,6,7,8-HxCDF				
2,3,4,6,7,8-HxCDF				
1,2,3,7,8,9-HxCDF				
Total HxCDF				
1,2,3,4,6,7,8-HpCDF				
1,2,3,4,7,8,9-HpCDF				
Total HpCDF				
Octa CDF				
Total PCDF[h]				
Total PCDD/PCDF[h]				
Non-PAH HAPs				
Acetaldehyde[e]				
Acrolein[e]				
Benzene[e]	2.16E-06	3.24E-04	1.89E-04	**4.32E-05**
1,3-Butadiene[e]				
Ethylbenzene[e]	1.16E-05	1.75E-03	1.02E-03	8.73E-04
Formaldehyde[e]	3.66E-06	5.49E-04	3.20E-04	**7.31E-05**
Hexane[e]	6.24E-06	9.36E-04	5.46E-04	4.68E-04
Isooctane	7.49E-08	1.12E-05	6.55E-06	5.61E-06
Methyl Ethyl Ketone[e]	2.04E-06	3.06E-04	1.78E-04	1.53E-04
Pentane[e]				
Propionaldehyde[e]				
Quinone[e]				
Methyl chloroform[e]				
Toluene[e]	8.73E-06	1.31E-03	7.64E-04	6.55E-04
Xylene[e]	5.03E-05	7.55E-03	4.40E-03	3.77E-03
POM (7-PAH Group)		6.90E-05		**9.19E-06**

Pollutant	Emission Factor[a] Loadout (lb/ton)	Emissions (lb/hr) 1-hr Average	Emissions (T/yr)	TAPs Emissions (lb/hr) **Annual** or 24-hr Average
PAH HAPs[f]				
2-Methylnaphthalene	8.11E-06	1.22E-03	7.10E-04	**1.62E-04**
3-Methylchloranthrene[e]				
Acenaphthene	8.86E-07	1.33E-04	7.76E-05	**1.77E-05**
Acenaphthylene	9.55E-08	1.43E-05	8.35E-06	**1.91E-06**
Anthracene	2.39E-07	3.58E-05	2.09E-05	**4.77E-06**
Benzo(a)anthracene	6.48E-08	9.72E-06	5.67E-06	**1.29E-06**
Benzo(a)pyrene[e]	7.84E-09	1.18E-06	6.86E-07	**1.57E-07**
Benzo(b)fluoranthene	2.59E-08	3.89E-06	2.27E-06	**5.18E-07**
Benzo(e)pyrene	2.66E-08	3.99E-06	2.33E-06	**5.31E-07**
Benzo(g,h,I)perylene	6.48E-09	9.72E-07	5.67E-07	**1.29E-07**
Benzo(k)fluoranthene	7.50E-09	1.13E-06	6.56E-07	**1.50E-07**
Chrysene	3.51E-07	5.27E-05	3.07E-05	**7.02E-06**
Dibenzo(a,h)anthracene	1.26E-09	1.89E-07	1.10E-07	**2.52E-08**
Dichlorobenzene				
Fluoranthene	1.70E-07	2.56E-05	1.49E-05	**3.41E-06**
Fluorene	2.63E-06	3.94E-04	2.30E-04	**5.24E-05**
Indeno(1,2,3-cd)pyrene	1.60E-09	2.40E-07	1.40E-07	**3.20E-08**
Naphthalene[e]	4.26E-06	6.39E-04	3.73E-04	**8.51E-05**
Perylene	7.50E-08	1.13E-05	6.56E-06	**1.50E-06**
Phenanthrene	2.76E-06	4.14E-04	2.42E-04	**5.52E-05**
Pyrene	5.11E-07	7.67E-05	4.47E-05	**1.02E-05**
Non-HAP Organic Compounds				
Acetone[e]	1.95E-06	2.92E-04	1.70E-04	1.46E-04
Benzaldehyde				
Butane				
Butyraldehyde				
Crotonaldehyde[e]				
Ethylene	2.95E-05	4.43E-03	2.58E-03	2.21E-03
Heptane				
Hexanal				
Isovaleraldehyde				
2-Methyl-1-pentene				
2-Methyl-2-butene				
3-Methylpentane				
1-Pentene				
n-Pentane				
Valeraldehyde				
Metals				
Antimony[e]				
Arsenic[e]				
Barium[e]				
Beryllium[e]				
Cadmium[e]				
Chromium[e]				
Cobalt[e]				
Copper[e]				
Hexavalent Chromium[e]				
Manganese[e]				
Mercury[e]				
Molybdenum[e]				
Nickel[e]				
Phosphorus[e]				
Silver[e]				
Selenium[e]				
Thallium[e]				
Vanadium[e]				
Zinc[e]				

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

b) AP-42, Table 11.1-14, Predictive Emission Factor Equations for Load-Out and Silo Filling Operations, 3/04 Defaults: (-V) = 0.5 T (^oF) = 325

		LOADOUT	SILO FILL	
Total PM EF = $0.000181+0.00141(-V)e^{((0.0251)(T+460)-20.43)}$ + $000332+ 0.00105(-V)e^{((0.0251)(T+46}$	=	5.219E-04	5.859E-04	(split addends)
Organic PM EF = $0.00141(-V)e^{((0.0251)(T+460)-20.43)}$ + $0.00105(-V)e^{((0.0251)(T+460)-20.43)}$	=	3.409E-04	2.539E-04	(split addends)
TOC PM EF = $0.0172(-V)e^{((0.0251)(T+460)-20.43)}$ + $0.0504(-V)e^{((0.0251)(T+460)-20.43)}$	=	4.159E-03	1.219E-02	(split addends)
CO PM EF = $0.00558(-V)e^{((0.0251)(T+460)-20.43)}$ + $0.00488(-V)e^{((0.0251)(T+460)-20.43)}$	=	1.349E-03	1.180E-03	(split addends)

e) IDAPA Toxic Air Pollutant

f) AP-42, Table 11.1-15, Speciation Profiles for Load-out, Silo Filling, & Asphalt Storage--Organic Particulate-Based Compounds, 3/04 (EF=Spec% * Organic PM EF)

g) AP-42, Table 11.1-16, Speciation Profiles for Load-out, Silo Filling, &Asphalt Storage--Organic Volatile-Based Compounds, 3/04, (EF=Spec% * TOC PM EF)

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

Pollutants shown in blue text are organic volatile-based compounds, EF = Spec% x TOC PM EF.

Facility: **Dixie River dba River Rock Sand & Gravel 00586**

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Load-out Operations AP-42 Section 11.1, Page 2

Fuel Type Toggle =	1	
Max Hourly Production	150	T/hr
Max Daily Production	1,800	Tons/day
Max Annual Production	175,000	Tons/yr

Pollutant	Emission Factor[a] Loadout (lb/ton)	Emissions (lb/hr) 1-hr Average	Emissions (T/yr)	TAPs Emissions (lb/hr) **Annual** or 24-hr Average
non-PAH HAPs[g]				
Bromomethane[e]	3.99E-07	5.99E-05	3.49E-05	2.99E-05
2-Butanone (see Methyl Ethyl Ketone)				
Carbon disulfide[e]	5.41E-07	8.11E-05	4.73E-05	4.05E-05
Chloroethane (Ethyl chloride[e])	8.73E-09	1.31E-06	7.64E-07	6.55E-07
Chloromethane (Methyl chloride[e])	6.24E-07	9.36E-05	5.46E-05	4.68E-05
Cumene[e]	4.57E-06	6.86E-04	4.00E-04	3.43E-04
n-Hexane (see Hexane[e])				
Methylene chloride (Dichloromethane[e])				
MTBE				
Styrene[e]	3.04E-07	4.55E-05	2.66E-05	2.28E-05
Tetrachloroethene (Tetrachloroethylene[e])	3.20E-07	4.80E-05	2.80E-05	2.40E-05
1,1,1-Trichloroethane (Methyl chloroform[e])				
Trichloroethene (Trichloroethylene[e])				
Trichlorofluoromethane	5.41E-08	8.11E-06	4.73E-06	4.05E-06
m-/p-Xylene[e] (added into Xylene[e])	1.71E-05	2.56E-03	1.49E-03	1.28E-03
o-Xylene[e] (added into Xylene[e])	3.33E-05	4.99E-03	2.91E-03	2.50E-03
Phenol[e,f]	4.02E-06	6.03E-04	3.52E-04	3.02E-04
Non-HAP Organic Compounds				
Methane	2.70E-04	4.05E-02	2.37E-02	2.03E-02

Pollutants shown in blue text are organic volatile-based compounds, EF = Spec% x TOC PM E

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

Facility:	**Dixie River dba River Rock Sand & Gravel 00586**			**EMISSION INVENTORY**	
3/3/2020 14:10	**Permit/Facility ID:**	**P-2018.0029**	**777-00586**	**TONS PER YEAR**	

Max Controlled Emissions of Any Pollutant from Drum Mix HMA Plant Fabric Filter, Tank Heater, Generator, Silo Fill/Load-out

A. Drum Mix Plant: **150** Tons/hour 1,167 Hours/year **175,000** Tons/year HMA throughput **1,800** hrs/day

Maximum emission for each pollutant from any fuel-burning options selected on "Facility Data" worksheet. Fuels Selected = #2 Fuel Oil Used Oil Natural Gas LPG/Propane

B. Tank Heater: **1.0000** MMBtu/hr **4,500** Hours/year **12** hrs/day

Maximum emission for each pollutant for heater burning any fuel selected on "Facility Data" worksheet. Fuels Selected = #2 Fuel Oil

C1. IC Engine 1: **3.32** gal/hour **4500** Hours/year IC Engine <600hp #2 Fuel Oil **24** hrs/day

C2. IC Engine 2: **40.87** gal/hour **4500** Hours/year IC Engine > 600hp #2 Fuel Oil **24** hrs/day

Pollutant	**A Drum Mix** Max Emission Rate for Pollutant (T/yr)	**B Asphalt Tank Heater** Max Emission Rate for Pollutant (T/yr)	**C IC Engine IC1 + IC2** Max Emission Rate for Pollutant (T/yr)	**D Load-out & Silo Filling**, Emission Rate for Pollutant (T/yr)	**E POINT SOURCE TOTAL** of Max Emission Rates from A, B, & C (T/yr) Exclude Fugitives (D)
PM (total)	2.89	5.42E-02	1.36E+00	9.69E-02	4.30
PM-10 (total)	2.01	3.78E-02	2.15E-01	9.69E-02	2.26
PM-2.5	1.95	2.53E-02	7.72E-01	9.69E-02	2.75
CO	11.38	8.21E-02	1.16E+01	2.21E-01	23.02
NOx	4.81	3.94E-01	3.79E+00		8.99
SO_2	7.79	1.17E+00	1.91E-02		8.97
VOC	2.80	9.13E-03	9.31E-01	3.53E-01	3.74
Lead	1.31E-03	2.48E-05	0.00E+00		1.34E-03
HCl [e]	1.84E-02	0.00E+00	0.00E+00		1.84E-02
Dioxins[e]					
2,3,7,8-TCDD	1.84E-11				1.84E-11
Total TCDD	8.14E-11				8.14E-11
1,2,3,7,8-PeCDD	2.71E-11				2.71E-11
Total PeCDD	1.93E-09				1.93E-09
1,2,3,4,7,8-HxCDD	3.68E-11	1.13E-11			4.81E-11
1,2,3,6,7,8-HxCDD	1.14E-10				1.14E-10
1,2,3,7,8,9-HxCDD	8.58E-11	1.25E-11			9.82E-11
Total HxCDD	1.05E-09				1.05E-09
1,2,3,4,6,7,8-Hp-CDD	4.20E-10	2.46E-10			6.66E-10
Total HpCDD	1.66E-09	3.28E-10			1.99E-09
Octa CDD	2.19E-09	2.63E-09			4.81E-09
Total PCDD[h]	6.91E-09	3.28E-09			1.02E-08
Furans[e]					
2,3,7,8-TCDF	8.49E-11				8.49E-11
Total TCDF	3.24E-10	5.42E-11			3.78E-10
1,2,3,7,8-PeCDF	3.76E-10				3.76E-10
2,3,4,7,8-PeCDF	7.35E-11				7.35E-11
Total PeCDF	7.35E-09	7.88E-12			7.36E-09
1,2,3,4,7,8-HxCDF	3.50E-10				3.50E-10
1,2,3,6,7,8-HxCDF	1.05E-10				1.05E-10
2,3,4,6,7,8-HxCDF	1.66E-10				1.66E-10
1,2,3,7,8,9-HxCDF	7.35E-10				7.35E-10
Total HxCDF	1.14E-09	3.28E-11			1.17E-09
1,2,3,4,6,7,8-HpCDF	5.69E-10				5.69E-10
1,2,3,4,7,8,9-HpCDF	2.36E-10				2.36E-10
Total HpCDF	8.75E-10	1.59E-10			1.03E-09
Octa CDF	4.20E-10	1.97E-10			6.17E-10
Total PCDF[h]	3.50E-09	5.09E-10			4.01E-09
Total PCDD/PCDF[h]	1.05E-08	3.78E-09			1.43E-08
Non-PAH HAPs					
Acetaldehyde[e]	1.14E-01		1.10E-03		1.15E-01
Acrolein[e]	2.28E-03		1.94E-04		2.47E-03
Benzene[e]	3.41E-02	0.00E+00	1.07E-02	5.30E-04	4.49E-02
1,3-Butadiene[e]	0.00E+00		4.00E-05		4.00E-05
Ethylbenzene[e]	2.10E-02			1.42E-03	2.10E-02
Formaldehyde[e]	2.71E-01	5.75E-05	2.20E-03	7.68E-03	2.74E-01
Hexane[e]	8.05E-02	0.00E+00		1.61E-03	8.05E-02
Isooctane	3.50E-03			9.86E-06	3.50E-03
Methyl Ethyl Ketone[e]	1.75E-03			5.94E-04	1.75E-03
Pentane[e]	0.00E+00	0.00E+00			0.00E+00
Propionaldehyde[e]	1.14E-02				1.14E-02
Quinone[e]	1.40E-02				1.40E-02
Methyl chloroform[e]	4.20E-03				4.20E-03
Toluene[e]	2.54E-01	0.00E+00	3.96E-03	1.43E-03	2.58E-01
Xylene[e]	1.75E-02	0.00E+00	2.72E-03	7.14E-03	2.02E-02
TOTAL Federal HAPs (T/yr)=					**9.68E-01**

Pollutant	**A Drum Mix** Max Emission Rate for Pollutant (T/yr)	**B Asphalt Tank Heater** Max Emission Rate for Pollutant (T/yr)	**C IC Engine IC1 + IC2** Max Emission Rate for Pollutant (T/yr)	**D Load-out & Silo Filling** Emission Rate for Pollutant (T/yr)	**E POINT SOURCE TOTAL** of Max Emission Rates from A, B, & C (T/yr) Exclude Fugitives (D)
PAH HAPs					
2-Methylnaphthalene	1.49E-02	0.00E+00		1.88E-03	1.49E-02
3-Methylchloranthrene[e]	0.00E+00	0.00E+00			0.00E+00
Acenaphthene	1.23E-04	8.70E-06	6.04E-05	1.82E-04	1.92E-04
Acenaphthylene	1.93E-03	3.28E-06	1.21E-04	1.15E-05	2.05E-03
Anthracene	2.71E-04	2.96E-06	1.74E-05	4.98E-05	2.92E-04
Benzo(a)anthracene[e]	1.84E-05	0.00E+00	9.56E-06	1.81E-05	2.79E-05
Benzo(a)pyrene[e]	8.58E-07	0.00E+00	3.43E-06	6.86E-07	4.29E-06
Benzo(b)fluoranthene[e]	8.75E-06	1.64E-06	1.41E-05	2.27E-06	2.45E-05
Benzo(e)pyrene	9.63E-06	0.00E+00		4.44E-06	9.63E-06
Benzo(g,h,I)perylene	3.50E-06	0.00E+00	7.51E-06	5.67E-07	1.10E-05
Benzo(k)fluoranthene[e]	3.59E-06	0.00E+00	2.91E-06	6.56E-07	6.49E-06
Chrysene[e]	1.58E-05	0.00E+00	1.96E-05	7.74E-05	3.54E-05
Dibenzo(a,h)anthracene	0.00E+00	0.00E+00	4.96E-06	1.10E-07	4.96E-06
Dichlorobenzene	0.00E+00	0.00E+00			0.00E+00
Fluoranthene	5.34E-05	7.22E-07	5.86E-05	4.82E-05	1.13E-04
Fluorene	9.63E-04	5.25E-07	1.91E-04	4.54E-04	1.15E-03
Indeno(1,2,3-cd)pyrene[e]	6.13E-07	0.00E+00	5.60E-06	1.40E-07	6.21E-06
Naphthalene[e]	5.69E-02	2.79E-04	1.72E-03	7.77E-04	5.89E-02
Perylene	7.70E-07	0.00E+00		1.32E-05	7.70E-07
Phenanthrene	2.01E-03	8.05E-05	5.44E-04	6.42E-04	2.64E-03
Pyrene	2.63E-04	5.25E-07	5.16E-05	1.42E-04	3.15E-04
Non-HAP Organic Compounds					
Acetone[e]	7.26E-02	0.00E+00		7.57E-04	7.26E-02
Benzaldehyde	9.63E-03	0.00E+00			9.63E-03
Butane	5.86E-02	0.00E+00			5.86E-02
Butyraldehyde	1.40E-02	0.00E+00			1.40E-02
Crotonaldehyde[e]	7.53E-03	0.00E+00			7.53E-03
Ethylene	6.13E-01	0.00E+00		1.43E-02	6.13E-01
Heptane	8.23E-01	0.00E+00			8.23E-01
Hexanal	9.63E-03	0.00E+00			9.63E-03
Isovaleraldehyde	2.80E-03	0.00E+00			2.80E-03
2-Methyl-1-pentene	3.50E-01	0.00E+00			3.50E-01
2-Methyl-2-butene	5.08E-02	0.00E+00			5.08E-02
3-Methylpentane	1.66E-02	0.00E+00			1.66E-02
1-Pentene	1.93E-01	0.00E+00			1.93E-01
n-Pentane[e]	1.84E-02	0.00E+00			1.84E-02
Valeraldehyde[e]	5.86E-03	0.00E+00			5.86E-03
Metals					
Antimony[e]	1.58E-05	8.62E-05			1.02E-04
Arsenic[e]	4.90E-05	2.17E-05			7.07E-05
Barium[e]	5.08E-04	4.22E-05			5.50E-04
Beryllium[e]	0.00E+00	4.56E-07			4.56E-07
Cadmium[e]	3.59E-05	6.54E-06			4.24E-05
Chromium[e]	4.81E-04	1.39E-05			4.95E-04
Cobalt[e]	2.28E-06	9.88E-05			1.01E-04
Copper[e]	2.71E-04	2.89E-05			3.00E-04
Hexavalent Chromium[e]	3.94E-05	4.07E-06			4.34E-05
Manganese[e]	6.74E-04	4.93E-05			7.23E-04
Mercury[e]	2.28E-04	1.86E-06			2.29E-04
Molybdenum[e]	0.00E+00	1.29E-05			1.29E-05
Nickel[e]	5.51E-03	1.39E-03			6.90E-03
Phosphorus[e]	2.45E-03	1.55E-04			2.61E-03
Silver[e]	4.20E-05	0.00E+00			4.20E-05
Selenium[e]	3.06E-05	1.12E-05			4.18E-05
Thallium[e]	3.59E-07				3.59E-07
Vanadium[e]	0.00E+00	5.22E-04			5.22E-04
Zinc[e]	5.34E-03	4.78E-04			5.82E-03

e) IDAPA Toxic Air Pollutant

Facility:	Dixie River dba River Rock Sand & Gravel 00586				EMISSION INVENTORY					
3/3/2020 14:10	Permit/Facility ID:		P-2018.0029	777-00586	TONS PER YEAR				Page 2 of 2	

Max Controlled Emissions of Any Pollutant from Drum Mix HMA Plant Fabric Filter, Tank Heater, Generator, Silo Fill/Load-out

A. Drum Mix Plant:	**150**	Tons/hour	1,167	Hours/year	**175,000**	Tons/year			**1,800**	Tons/day
Maximum emission for each pollutant from any fuel-burning option selected. Fuels Selected =						#2 Fuel Oil	Used Oil	Natural Gas	LPG/Propane	
B. Tank Heater:	**1.0000**	MMBtu/hr	**4,500**	Hours/year					**12**	hrs/day
Maximum emission for each pollutant from any fuel-burning option selected. Fuels Selected =						#2 Fuel Oil				
C1. Generator G1:	**3.32**	gal/hour	**4500**	Hours/year		#2 Fuel Oil	IC Engine <600hp		**24**	hrs/day
C2. Generator G2:	**40.87**	gal/hour	**4500**	Hours/year		#2 Fuel Oil	IC Engine > 600hp		**24**	hrs/day

Pollutant	**A** **Drum Mix** Max Emission Rate for Pollutant (T/yr)	**B** **Asphalt Tank Heater** Max Emission Rate for Pollutant (T/yr)	**C Generator** Max Emission Rate for Pollutant (T/yr)	**D Load-out, Silo Filling, & Tank Storage** Emission Rate for Pollutant (T/yr)	**E POINT SOURCE TOTAL** of Max Emission Rates from A, B, & C (T/yr) Exclude Fugitives (D)
non-PAH HAPs[g]					
Bromomethane[e]				8.72E-05	0.00E+00
2-Butanone (see Methyl Ethyl Ketone)					0.00E+00
Carbon disulfide[e]				2.18E-04	0.00E+00
Chloroethane (Ethyl chloride[e])				4.34E-05	0.00E+00
Chloromethane (Methyl chloride[e])				3.00E-04	0.00E+00
Cumene				4.00E-04	0.00E+00
n-Hexane				0.00E+00	0.00E+00
Methylene chloride (Dichloromethane[e])				2.88E-06	0.00E+00
MTBE					0.00E+00
Styrene[e]				8.41E-05	0.00E+00
Tetrachloroethene (Tetrachloroethylene[e])				2.80E-05	0.00E+00
1,1,1-Trichloroethane (Methyl chloroform[e])				0.00E+00	0.00E+00
Trichloroethene (Trichloroethylene[e])				0.00E+00	0.00E+00
Trichlorofluoromethane				4.73E-06	0.00E+00
m-/p-Xylene[e]				3.62E-03	0.00E+00
o-Xylene[e]				3.52E-03	0.00E+00
Phenol[e,f]				3.52E-04	0.00E+00
Non-HAP Organic Compounds					
Methane				3.01E-01	0.00E+00

e) IDAPA Toxic Air Pollutant

Facility:	**Dixie River dba River Rock Sand & Gravel 00586**			**TAPs EL Screen - ALL SOURCES**	
3/3/2020 14:10	**Permit/Facility ID:**	**P-2018.0029**	**777-00586**	586 pollutants are shown in bold	Page 1 of 2

Max Emissions of Any Pollutant from Drum Mix HMA Plant Fabric Filter, Tank Heater, Silo Fill/Load-out - Generator not included

A. Drum Mix Plant:	**150** Tons/hour	1,167 Hours/year		**175,000** Tons/year		**1,800** Tons/day	
Maximum emission for each pollutant from any fuel-burning option selected on "Facility Data" worksheet							
B. Tank Heater:	**1.0000** MMBtu Rated	**4,500** Hours/year		**D. Include all emissions from Load-out/Silo Filling?**			**Yes**
Maximum emission for each pollutant for heater burning any fuel selected on "Facility Data" worksheet				Short Term Source Factor 586 ELs?			1
C1. IC Engine G1:	**3.32** gal/hour	**4500** Hours/year	IC Engine <600hp		#2 Fuel Oil	**24** hrs/day	
C2. IC Engine G2:	**40.87** gal/hour	**4500** Hours/year	IC Engine > 600hp		#2 Fuel Oil	**24** hrs/day	

Pollutant	**TOTAL** of Max Emission Rates from A, B, & D (lb/hr)	**TAPs** Screening Emission Limit (EL) Increment[b] (lb/hr)	**TAPs** Emissions Exceed EL Increment?	**Modeled? Meets AAC or AACC?**
HCl [e]	0.032	0.05	No	
Dioxins		**Toxic Equivalency Factor[c]**	**Adjusted Emission Rate (lb/hr)**	
2,3,7,8-TCDD	4.20E-12	1.0	4.20E-12	
Total TCDD	1.86E-11	n/a		
1,2,3,7,8-PeCDD	6.19E-12	1.0	6.19E-12	
Total PeCDD	4.39E-10	n/a		
1,2,3,4,7,8-HxCDD	1.10E-11	0.1	1.10E-12	
1,2,3,6,7,8-HxCDD	2.60E-11	0.1	2.60E-12	
1,2,3,7,8,9-HxCDD	2.24E-11	0.1	2.24E-12	
Total HxCDD	2.40E-10	n/a		
1,2,3,4,6,7,8-Hp-CDD	1.52E-10	0.01	1.52E-12	
Total HpCDD	4.55E-10	n/a		
Octa CDD	1.10E-09	0.0003	3.30E-13	
Total PCDD	2.33E-09	n/a		
Furans				
2,3,7,8-TCDF	1.94E-11	0.1	1.94E-12	
Total TCDF	8.63E-11	n/a		
1,2,3,7,8-PeCDF	8.59E-11	0.03	2.58E-12	
2,3,4,7,8-PeCDF	1.68E-11	0.3	5.03E-12	
Total PeCDF	1.68E-09	n/a		
1,2,3,4,7,8-HxCDF	7.99E-11	0.1	7.99E-12	
1,2,3,6,7,8-HxCDF	2.40E-11	0.1	2.40E-12	
2,3,4,6,7,8-HxCDF	3.80E-11	0.1	3.80E-12	
1,2,3,7,8,9-HxCDF	1.68E-10	0.1	1.68E-11	
Total HxCDF	2.67E-10	n/a		
1,2,3,4,6,7,8-HpCDF	1.30E-10	0.01	1.30E-12	
1,2,3,4,7,8,9-HpCDF	5.39E-11	0.01	5.39E-13	
Total HpCDF	2.36E-10	n/a		
Octa CDF	1.41E-10	0.0003	4.23E-14	
Total PCDF	9.15E-10	n/a		
Total PCDD/PCDF	3.26E-09	n/a		
TOTAL	Adjusted lb/hr	TAPs EL for 2,3,7,8 TCDD	**Exceeds TAPs EL?**	**Modeled?**
Dioxin/Furans[c]	6.06E-11	1.50E-10	No	
Non-PAH HAPs				
Acetaldehyde	2.60E-02	3.00E-03	Exceeds	
Acrolein	1.95E-03	0.017	No	
Benzene	7.91E-03	8.00E-04	Exceeds	
1,3-Butadiene				
Ethylbenzene	1.92E-02	29	No	
Formaldehyde	6.37E-02	5.10E-04	Exceeds	
Hexane	7.04E-02	12	No	
Isooctane	3.01E-03			
Methyl Ethyl Ketone	2.01E-03	39.3	No	
Pentane	0.00E+00	118	No	
Propionaldehyde	9.75E-03	0.0287	No	
Quinone	1.20E-02	0.027	No	
Methyl chloroform	3.60E-03	127	No	
Toluene	2.19E-01	25	No	
Xylene	2.11E-02	29	No	

Pollutant	**TOTAL** of Max Emission Rates from A, B, & D (lb/hr)	**TAPs** Screening Emission Limit (EL) Increment[b] (lb/hr)	**TAPs** Emissions Exceed EL Increment?	**Modeled? Meets AAC or AACC?**
PAH HAPs				
2-Methylnaphthalene	3.83E-03	9.10E-05	Exceeds	
3-Methylchloranthrene	0.00E+00	2.50E-06	No	
Acenaphthene	7.15E-05	9.10E-05	No	
Acenaphthylene	4.43E-04	9.10E-05	Exceeds	
Anthracene	7.40E-05	9.10E-05	No	
Benzo(a)anthracene	8.33E-06			see POM
Benzo(a)pyrene	3.52E-07	2.00E-06	No	see POM
Benzo(b)fluoranthene	2.89E-06			see POM
Benzo(e)pyrene	3.21E-06	9.10E-05	No	
Benzo(g,h,I)perylene	9.28E-07	9.10E-05	No	
Benzo(k)fluoranthene	9.69E-07			see POM
Chrysene	2.13E-05			see POM
Dibenzo(a,h)anthracene	2.52E-08			see POM
Dichlorobenzene	0.00E+00	9.10E-05	No	
Fluoranthene	2.34E-05	9.10E-05	No	
Fluorene	3.24E-04	9.10E-05	Exceeds	
Indeno(1,2,3-cd)pyrene	1.72E-07			see POM
Naphthalene[e]	1.32E-02	9.10E-05	Exceeds	
Perylene	3.20E-06	9.10E-05	No	
Phenanthrene	6.24E-04	9.10E-05	Exceeds	
Pyrene	9.26E-05	9.10E-05	Exceeds	
PolycyclicOrganicMatter[d]	3.40E-05	2.00E-06	Exceeds	
Non-HAP Organic Compounds				
Acetone	6.29E-02	119	No	
Benzaldehyde	8.25E-03			
Butane	5.03E-02			
Butyraldehyde	1.20E-02			
Crotonaldehyde	6.45E-03	0.38	No	
Ethylene	5.37E-01			
Heptane	7.05E-01	109	No	
Hexanal	8.25E-03			
Isovaleraldehyde	2.40E-03			
2-Methyl-1-pentene	3.00E-01			
2-Methyl-2-butene	4.35E-02			
3-Methylpentane	1.43E-02			
1-Pentene	1.65E-01			
n-Pentane[e]	1.58E-02	118	No	
Valeraldehyde (n-Valeraldehyde)	5.03E-03	11.7	No	
Metals				
Antimony[e]	3.27E-05	0.033	No	
Arsenic	1.61E-05	1.50E-06	Exceeds	
Barium	4.44E-04	0.033	No	
Beryllium	1.04E-07	2.80E-05	No	
Cadmium	9.68E-06	3.70E-06	Exceeds	
Chromium	4.16E-04	0.033	No	
Cobalt	2.39E-05	0.0033	No	
Copper	2.39E-04	0.013	No	
Hexavalent Chromium	9.92E-06	5.60E-07	Exceeds	
Manganese	5.88E-04	0.067	No	
Mercury	1.95E-04	0.003	No	
Molybdenum	2.87E-06	0.333	No	
Nickel	1.58E-03	2.70E-05	Exceeds	
Phosphorus	2.13E-03	0.007	No	
Silver	3.60E-05	0.007	No	
Selenium	2.87E-05	0.013	No	
Thallium	3.08E-07	0.007	No	
Vanadium	1.16E-04	0.003	No	
Zinc	4.68E-03	0.667	No	

a) Reserved.
b) Toxic Air Pollutants, IDAPA 58.01.01.585 and .586, levels in effect as of February 25, 2009
c) 2005, Van den Berg, et al, The 2005 World Health Organization Reevaluation of Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-Like Compounds, *Toxicological Sciences* 93(2), 223-241 (2006). Accessible at http://toxsci.oxfordjournals.org/cgi/reprint/93/2/223.
Use of the 2005 WHO toxic equivalency factors (TEFs) is consistent with current EPA recommendations for TRI reporting (72 FR 26544, May 10, 2007)
n/a = not available. IDAPA 58.01.01.586, TAPs Carcinogenic Increments: Total of adjusted emission rates are treated as a single TAP (2,3,7,8 TCDD)
d) IDAPA 58.01.01.586, Polycyclic Organic Matter: Emissions of highlighted PAHs h shall be considered together as one TAP equivalent in potency to benzo(a)pyrene.
e) Naphthalene is listed as a noncarcinogenic TAP in IDAPA 58.01.01.585 (EL = 3.33 lb/hr), but must also be considered as a carcinogenic PAH (EL = 9.10E-05 lb/hr)

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

Pollutants shown in blue text are emitted only when burning Used Oil, but not when burning #2 Fuel Oil or Natural Gas

TAPs from the IC engines are not included in this summary. They are regulated by a NESHAP/NSPS and not to be inculded in the TAPs analysis

Facility:	Dixie River dba River Rock Sand & Gravel 00586			
3/3/2020 14:10	Permit/Facility ID:	P-2018.0029	777-00586	

TAPs EL Screen - ALL SOURCES

Max Emissions of Any Pollutant from Drum Mix HMA Plant Fabric Filter, Tank Heater, Silo Fill/Load-out - Generator not included

A. Drum Mix Plant:	**150** Tons/hour	1,167 Hours/year	**175,000** Tons/year	**1,800** Tons/day		
Maximum emission for each pollutant from any fuel-burning option selected in "Facility Data" worksheet.						
B. Tank Heater:	**1.0000** MMBtu Rated	**4,500** Hours/year	**D. Include all emissions from Load-out/Silo Filling?**	**Yes**		
Maximum emission for each pollutant for heater burning any fuel selected in "Facility Data" worksheet.						
C1. IC Engine G1:	**3.32** gal/hour	**4500** Hours/year		#2 Fuel Oil	**24** hrs/day	
C2. IC Engine G2:	**40.87** gal/hour	**4500** Hours/year		#2 Fuel Oil	**24** hrs/day	

Pollutant	**TOTAL** of Max Emission Rates from A, B, & D (lb/hr)	**TAPs** Screening Emission Limit (EL) Increment[b] (lb/hr)	**TAPs** Emissions Exceed EL Increment?	**Modeled?**
non-PAH HAPs[g]				
Bromomethane (Methyl bromide[e])	7.47E-05	1.27	No	
2-Butanone (see Methyl Ethyl Ketone)				
Carbon disulfide[e]	1.87E-04	2	No	
Chloroethane (Ethyl chloride[e])	3.72E-05	176	No	
Chloromethane (Methyl chloride[e])	2.57E-04	6.867	No	
Cumene[e]	3.43E-04	16.3	No	
n-Hexane[e] (see Hexane[e])				
Methylene chloride (Dichloromethane[e])	2.47E-06	1.60E-03	No	
MTBE	0.00E+00			
Styrene[e]	7.21E-05	6.67	No	
Tetrachloroethene (Tetrachloroethylene[e])	2.40E-05	1.30E-02	No	
1,1,1-Trichloroethane (see Methyl chloroform[e])				
Trichloroethene (Trichloroethylene[e])	0.00E+00	17.93	No	
Trichlorofluoromethane	4.05E-06			
m-/p-Xylene[e] (added into Xylene[e])				
o-Xylene[e] (added into Xylene[e])				
Phenol[e,f]	3.02E-04	1.27	No	
Non-HAP Organic Compounds				
Methane	2.58E-01			

a) For HMA facilities subject to NSPS (40 CFR 60, Subpart I), PTE includes fugitive emissions of PM from load-out, silo filling & storage tank operations.
e) IDAPA Toxic Air Pollutant, 58.01.01.585 or .586

Maximum Controlled Emissions of Any Pollutant from Drum Mix HMA Plant with Fabric Filter, Tank Heater, Generator, Silo Fill/Load-out

A. Drum Mix Plant:	**150** Tons/hour		1,167 Hours/year	**175,000** Tons/year				**1,800** Tons/day	
Maximum emission for each pollutant from any fuel-burning options selected on "Facility Data" worksheet. Fuels Selected =						#2 Fuel Oil	Used Oil	Natural Gas	LPG/Propane
B. Tank Heater:	**1.0000** MMBtu Rated		**4,500** Hours/year					**12** hrs/day	
Maximum emission for each pollutant for heater burning any fuel selected on "Facility Data" worksheet. Fuels Selected =						#2 Fuel Oil			
C1. IC Engine:	**3.32** gal/hour		**4500** Hours/year	IC Engine < 600hp		#2 Fuel Oil		**24** hrs/day	
C2. IC Engine:	**40.87** gal/hour		**4500** Hours/year	IC Engine > 600h		#2 Fuel Oil		**24** hrs/day	

Pollutant	A **Drum Dryer** Max Emission Rate for Pollutant (lb/hr)	B **Asphaltic Oil Tank Heater** Max Emission Rate for Pollutant (lb/hr)	C1 * see note **IC1< 600 bhp Generator** Max Emission Rate for Pollutant (lb/hr)	C2 * see note **IC2 > 600 bhp Generator** Max Emission Rate for Pollutant (lb/hr)	D1 **Silo Filling** Emission Rate for Pollutant (lb/hr)	D2 **Load-out** Emission Rate for Pollutant (lb/hr)
PM (total)						
PM-10 (total)						
PM-2.5						
CO						
NOx						
SO_2						
VOC						
Lead						
HCl [e]	3.15E-02	0.00E+00	0	0		
Dioxins[e]						
2,3,7,8-TCDD	4.20E-12		0	0		
Total TCDD	1.86E-11		0	0		
1,2,3,7,8-PeCDD	6.19E-12		0	0		
Total PeCDD	4.39E-10		0	0		
1,2,3,4,7,8-HxCDD	8.39E-12	2.59E-12	0	0		
1,2,3,6,7,8-HxCDD	2.60E-11		0	0		
1,2,3,7,8,9-HxCDD	1.96E-11	2.85E-12	0	0		
Total HxCDD	2.40E-10		0	0		
1,2,3,4,6,7,8-Hp-CDD	9.59E-11	5.62E-11	0	0		
Total HpCDD	3.80E-10	7.50E-11	0	0		
Octa CDD	4.99E-10	6.00E-10	0	0		
Total PCDD[h]	1.58E-09	7.50E-10	0	0		
Furans[e]						
2,3,7,8-TCDF	1.94E-11		0	0		
Total TCDF	7.39E-11	1.24E-11	0	0		
1,2,3,7,8-PeCDF	8.59E-11		0	0		
2,3,4,7,8-PeCDF	1.68E-11		0	0		
Total PeCDF	1.68E-09	1.80E-12	0	0		
1,2,3,4,7,8-HxCDF	7.99E-11		0	0		
1,2,3,6,7,8-HxCDF	2.40E-11		0	0		
2,3,4,6,7,8-HxCDF	3.80E-11		0	0		
1,2,3,7,8,9-HxCDF	1.68E-10		0	0		
Total HxCDF	2.60E-10	7.50E-12	0	0		
1,2,3,4,6,7,8-HpCDF	1.30E-10		0	0		
1,2,3,4,7,8,9-HpCDF	5.39E-11		0	0		
Total HpCDF	2.00E-10	3.64E-11	0	0		
Octa CDF	9.59E-11	4.50E-11	0	0		
Total PCDF[h]	7.99E-10	1.16E-10	0	0		
Total PCDD/PCDF[h]	2.40E-09	8.62E-10	0	0		
Non-PAH HAPs						
Acetaldehyde[e]	2.60E-02		0	0		
Acrolein[e]	1.95E-03		0	0		
Benzene[e]	**7.79E-03**	**0.00E+00**	0	0	**7.79E-05**	**4.32E-05**
1,3-Butadiene[e]			0	0		
Ethylbenzene[e]	1.80E-02		0	0	3.47E-04	8.73E-04
Formaldehyde[e]	**6.19E-02**	**1.31E-05**	0	0	**1.68E-03**	**7.31E-05**
Hexane[e]	6.90E-02	0.00E+00	0	0	9.14E-04	4.68E-04
Isooctane	3.00E-03		0	0	2.83E-06	5.61E-06
Methyl Ethyl Ketone[e]	1.50E-03		0	0	3.56E-04	1.53E-04
Pentane[e]		0.00E+00	0	0		
Propionaldehyde[e]	9.75E-03		0	0		
Quinone[e]	1.20E-02		0	0		
Methyl chloroform[e]	3.60E-03		0	0		
Toluene[e]	2.18E-01	0.00E+00	0	0	5.67E-04	6.55E-04
Xylene[e]	1.50E-02		0	0	2.35E-03	3.77E-03
POM (7-PAH Group)	**1.09E-05**	**3.75E-07**		**0.00E+00**	**1.35E-05**	**9.19E-06**

Pollutant	A **Drum Dryer** Max Emission Rate for Pollutant (lb/hr)	B **Asphaltic Oil Tank Heater** Max Emission Rate for Pollutant (lb/hr)	C1 * see note **IC1< 600 bhp Generator** Max Emission Rate for Pollutant (lb/hr)	C2 * see note **IC2 > 600 bhp Generator** Max Emission Rate for Pollutant	D **Silo Filling** Emission Rate for Pollutant (lb/hr)	D2 **Load-out** Emission Rate for Pollutant (lb/hr)
PAH HAPs						
2-Methylnaphthalene	**3.40E-03**	**0.00E+00**	0	0	**2.67E-04**	**1.62E-04**
3-Methylchloranthrene[e]	**0.00E+00**	**0.00E+00**	0	0		
Acenaphthene	**2.80E-05**	**1.99E-06**	0	0	**2.38E-05**	**1.77E-05**
Acenaphthylene	**4.39E-04**	**7.50E-07**	0	0	**7.10E-07**	**1.91E-06**
Anthracene	**6.19E-05**	**6.75E-07**	0	0	**6.59E-06**	**4.77E-06**
Benzo(a)anthracene[e]	**4.20E-06**	**0.00E+00**	0	0	**2.84E-06**	**1.29E-06**
Benzo(a)pyrene[e]	**1.96E-07**	**0.00E+00**	0	0	**0.00E+00**	**1.57E-07**
Benzo(b)fluoranthene[e]	**2.00E-06**	**3.75E-07**	0	0	**0.00E+00**	**5.18E-07**
Benzo(e)pyrene	**2.20E-06**	**0.00E+00**	0	0	**4.82E-07**	**5.31E-07**
Benzo(g,h,I)perylene	**7.99E-07**	**0.00E+00**	0	0	**0.00E+00**	**1.29E-07**
Benzo(k)fluoranthene[e]	**8.19E-07**	**0.00E+00**	0	0	**0.00E+00**	**1.50E-07**
Chrysene[e]	**3.60E-06**	**0.00E+00**	0	0	**1.07E-05**	**7.02E-06**
Dibenzo(a,h)anthracene[e]	**0.00E+00**	**0.00E+00**	0	0	**0.00E+00**	**2.52E-08**
Dichlorobenzene	**0.00E+00**	**0.00E+00**	0	0		
Fluoranthene	**1.22E-05**	**1.65E-07**	0	0	**7.61E-06**	**3.41E-06**
Fluorene	**2.20E-04**	**1.20E-07**	0	0	**5.12E-05**	**5.24E-05**
Indeno(1,2,3-cd)pyrene[e]	**1.40E-07**	**0.00E+00**	0	0	**0.00E+00**	**3.20E-08**
Naphthalene[e]	**1.30E-02**	**6.37E-05**	0	0	**9.23E-05**	**8.51E-05**
Perylene	**1.76E-07**	**0.00E+00**	0	0	**1.52E-06**	**1.50E-06**
Phenanthrene	**4.59E-04**	**1.84E-05**	0	0	**9.13E-05**	**5.52E-05**
Pyrene	**5.99E-05**	**1.20E-07**	0	0	**2.23E-05**	**1.02E-05**
Non-HAP Organic Compounds						
Acetone[e]	6.23E-02	0.00E+00	0	0	5.03E-04	1.46E-04
Benzaldehyde	8.25E-03	0.00E+00	0	0		
Butane	5.03E-02	0.00E+00	0	0		
Butyraldehyde	1.20E-02	0.00E+00	0	0		
Crotonaldehyde[e]	6.45E-03	0.00E+00	0	0		
Ethylene	5.25E-01	0.00E+00	0	0	1.01E-02	2.21E-03
Heptane	7.05E-01	0.00E+00	0	0		
Hexanal	8.25E-03	0.00E+00	0	0		
Isovaleraldehyde	2.40E-03	0.00E+00	0	0		
2-Methyl-1-pentene	3.00E-01	0.00E+00	0	0		
2-Methyl-2-butene	4.35E-02	0.00E+00	0	0		
3-Methylpentane	1.43E-02	0.00E+00	0	0		
1-Pentene	1.65E-01	0.00E+00	0	0		
n-Pentane	1.58E-02	0.00E+00	0	0		
Valeraldehyde[e]	5.03E-03	0.00E+00	0	0		
Metals						
Antimony[e]	1.35E-05	1.92E-05	0	0		
Arsenic[e]	**1.12E-05**	**4.95E-06**	0	0		
Barium[e]	4.35E-04	9.38E-06	0	0		
Beryllium[e]	**0.00E+00**	**1.04E-07**	0	0		
Cadmium[e]	**8.19E-06**	**1.49E-06**	0	0		
Chromium[e]	4.13E-04	3.08E-06	0	0		
Cobalt[e]	1.95E-06	2.20E-05	0	0		
Copper[e]	2.33E-04	6.42E-06	0	0		
Hexavalent Chromium[e]	**8.99E-06**	**9.30E-07**	0	0		
Manganese[e]	5.78E-04	1.09E-05	0	0		
Mercury[e]	1.95E-04	4.12E-07	0	0		
Molybdenum[e]	0.00E+00	2.87E-06	0	0		
Nickel[e]	**1.26E-03**	**3.17E-04**	0	0		
Phosphorus[e]	2.10E-03	3.45E-05	0	0		
Silver[e]	3.60E-05	0.00E+00	0	0		
Selenium[e]	2.63E-05	2.49E-06	0	0		
Thallium[e]	3.08E-07	0.00E+00	0	0		
Vanadium[e]	0.00E+00	1.16E-04	0	0		
Zinc[e]	4.58E-03	1.06E-04	0	0		

e) IDAPA Toxic Air Pollutant

Criteria Pollutant lb/hr emissions are maximum 1-hr averages

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

Pollutants shown in blue text are emitted only when burning Used Oil, but not when burning #2 Fuel Oil or Natural Gas

* TAPs from IC engines are set to zero because they are regulated by a NSPS/NESHAP

APPENDIX B – AMBIENT AIR QUALITY IMPACT ANALYSES

draft M E M O R A N D U M

DATE: February 26, 2020

TO: Joe Palmer, Permit Writer, Air Program

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

PROJECT: P-2018.0029 PROJ 62351, Modification of Permit to Construct (PTC) P-2018.0029 PROJECT 62351 for Dixie River dba River Rock Sand & Gravel Hot Mix Asphalt Plant; and modification of PTC P-2018.0021 PROJECT 62350 for Dixie River dba River Rock Sand & Gravel Concrete Batch Plant. Permit modifications will allow the two facilities to operate simultaneously at the Dixie River Pit.

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

Contents

Acronyms, Units, and Chemical Nomenclature

AAC	Acceptable Ambient Concentration of a non-carcinogenic TAP
AACC	Acceptable Ambient Concentration of a Carcinogenic TAP
acfm	Actual cubic feet per minute
AERMAP	The terrain data preprocessor for AERMOD
AERMET	The meteorological data preprocessor for AERMOD
AERMOD	American Meteorological Society/Environmental Protection Agency Regulatory Model
Appendix W	40 CFR 51, Appendix W – Guideline on Air Quality Models
As	Arsenic
BPIP	Building Profile Input Program
BRC	Below Regulatory Concern
CBP	Concrete Batch Plant
CFR	Code of Federal Regulations
CMAQ	Community Multi-Scale Air Quality Modeling System
CO	Carbon Monoxide
DEM	Digital Elevation Map
DEQ	Idaho Department of Environmental Quality
Dixie River	Dixie River dba River Rock Sand & Gravel
EL	Emissions Screening Level of a TAP
EPA	United States Environmental Protection Agency
GB	Americrete Ready Mix dba GB Redi-Mix
GEP	Good Engineering Practice
hr	hours
IC	internal combustion
Idaho Air Rules	Rules for the Control of Air Pollution in Idaho, located in the Idaho Administrative Procedures Act 58.01.01
ISCST3	Industrial Source Complex Short Term 3 dispersion model
K	Kelvin
m	Meters
m/sec	Meters per second
MMBtu	Million British Thermal Units
NAAQS	National Ambient Air Quality Standards
NO	Nitrogen Oxide
NO_2	Nitrogen Dioxide
NOx	Oxides of Nitrogen
NWS	National Weather Service
O_3	Ozone
PAH	Polyaromatic Hydrocarbons
Pb	Lead
PM_{10}	Particulate matter with an aerodynamic particle diameter less than or equal to a nominal 10 micrometers
$PM_{2.5}$	Particulate matter with an aerodynamic particle diameter less than or equal to a nominal 2.5 micrometers
POM	Polycyclic Organic Matter

ppb	parts per million
PRIME	Plume Rise Model Enhancement
PTC	Permit to Construct
PTE	Potential to Emit
SIL	Significant Impact Level
SO_2	Sulfur Dioxide
TAP	Toxic Air Pollutant
tpy	tons per year
USGS	United States Geological Survey
UTM	Universal Transverse Mercator
VOC	Volatile Organic Compounds
$\mu g/m^3$	Micrograms per cubic meter of air

1.0 Summary

Dixie River dba River Rock Sand & Gravel (Dixie River) submitted two Permit to Construct (PTC) applications to modify existing PTCs for operation of a portable hot mix asphalt (HMA) and a concrete batch plant (CBP) in Idaho. Idaho Administrative Procedures Act 58.01.01.203.02 and 203.03 (Idaho Air Rules Section 203.02 and 203.03) requires that no permit be issued unless it is demonstrated that applicable emissions do not result in violation of a National Ambient Air Quality Standard (NAAQS) or Toxic Air Pollutant (TAP) increment. This memorandum provides a summary of the applicability assessment for analyses and air impact analyses used to demonstrate compliance with applicable NAAQS and TAP increments, as required by Idaho Air Rules Section 203.02 and 203.03.

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

Table 1 presents key assumptions and results to be considered in the development of the permits. Idaho Air Rules require air impact analyses be conducted in accordance with methods outlined in 40 CFR 51, Appendix W *Guideline on Air Quality Models* (Appendix W). Appendix W requires that air quality impacts be assessed using atmospheric dispersion models with 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: 1) utilized appropriate methods and models; 2) was conducted using reasonably accurate or conservative model parameters and input data (review of emissions estimates was addressed by the DEQ permit writer); 3) adhered to established DEQ guidelines for new source review dispersion modeling; 4) showed either a) that estimated potential/allowable emissions are at a level defined as below regulatory concern (BRC) and do not require a NAAQS compliance demonstration; b) that predicted pollutant concentrations from emissions associated with the project as modeled were below Significant Impact Levels (SILs) or other applicable regulatory thresholds; or c) that predicted pollutant concentrations from emissions associated with the project as modeled, when appropriately combined with co-contributing sources and background concentrations, were below applicable NAAQS at ambient air locations where and when the project has a significant impact; 5) showed that TAP emissions increases associated with the project will not result in increased emissions above ELs or ambient air impacts exceeding allowable TAP increments.

This conclusion assumes that conditions in Table 1 are representative of facility design capacity or operations as limited by a federally enforceable permit condition. The DEQ permit writer should use Table 1 and other information presented in this memorandum to generate appropriate permit provisions/restrictions to assure the requirements of Appendix W are met regarding emissions representative of design capacity or permit allowable rates.

Summary of Submittals and Actions

- December 13, 2019: Applications received by DEQ.
- December 17, 2019: Regulatory start date.
- January 2, 2020: Application determined incomplete. A facility plot plan, showing equipment locations, was not provided.
- January 6, 2020: Dixie River provided a facility plot plan.
- February 5, 2020: Application determined complete by DEQ.

Table 1. KEY CONDITIONS USED IN MODELING ANALYSES	
Criteria/Assumption/Result	**Explanation/Consideration**
Key Conditions for Both Permits	
Existing Permit Conditions: Conditions in the existing PTC will be carried over for operation at the Dixie River Pit except as noted in this table.	The revised PTC will have specific conditions that will only apply when located at the Dixie River Pit.
Control of Vehicle Fugitive Emissions: Air impact analyses were performed assuming fugitive particulate emissions from vehicle traffic on unpaved roadways is negligible and could be reasonably accounted for in the background concentration used.	Emissions from vehicle traffic must be controlled to a high degree, otherwise compliance with particulate NAAQS has not been demonstrated.
Emission Rates: Emissions rates for applicable averaging periods are not greater than those used in the modeling analyses, as listed in this memorandum.	Compliance has not been demonstrated for emissions rates greater than those used in the modeling analyses.
P-2018.0029 HMA Plant	
Existing Permit Conditions: Conditions in the existing PTC for the portable HMA plant will be carried over for operation at the Dixie River Pit except as noted in this table.	The revised PTC for the portable HMA plant will have specific conditions that will only apply when located at the Dixie River Pit.
Dixie River Pit Location: The HMA drum dryer was modeled at 519,091 meters Easting, 4,838,035 meters Northing, zone 11.	NAAQS is only demonstrated for the layout modeled. Locations of HMA plant sources will be considered representative provided the HMA drum dryer stack is positioned within 100 feet of the modeled location.
Operation with a Co-Contributing CBP and Rock Crushing Plant at the Dixie River Pit: The HMA Plant was modeled with simultaneous operation of the Dixie River CBP (Facility ID: 027-00176) as described in modified PTC P-2018.0021 Project 62016 for the Dixie River Pit. The HMA Plant was also modeled with simultaneous operation of a rock crushing plant with a 25,000 ton/month throughput and no operation of internal combustion (IC) engines powering generators.	The issued permit must specify that that only the referenced rock crushing plant, with permit restrictions on the processing rate and IC engine operation, may operate at the Dixie River Pit while the HMA Plant is located at the site with the stationary CBP.
Multiyear Continuous Operation: The HMA was modeled as a permanent source operating year around at specified production rates.	The existing permit restricted operations at any one site to 1 year. This restriction is not necessary when operating at the Dixie River Pit as described in this memorandum.
Source Setback from Ambient Air: Site-specific impact modeling was performed, using the ambient air boundary described by the applicant and planned specific locations of the HMA plant, CBP, and rock crushing plant.	Specified setbacks in the existing permit do not apply when the HMA plant is operated at the Dixie River Pit; however, emission sources must be located where they were represented in the air impact model.
Operation of Generators: No diesel-fired IC engines, powering electrical generators, were included in the air impact analyses.	Operation of generators is a substantial portion of emissions from an HMA plant. Since this source was excluded from the analyses, the permit must prohibit the use of generators by the HMA plant at the Dixie River Pit.
Reduced Production when Co-located with a Rock Crushing Plant: Air impact modeling was performed using full allowable production rates for the HMA plant with simultaneous operation of a rock crushing plant.	When the HMA plant is operating at the Dixie River Pit as described in the memorandum, it is not necessary to reduce HMA production when a rock crushing plant is also operating at the site.

Table 1. KEY CONDITIONS USED IN MODELING ANALYSES	
Criteria/Assumption/Result	**Explanation/Consideration**
Drum Dryer Stack Height: The drum dryer stack height must be as listed in this memorandum or higher.	NAAQS compliance is still assured if actual stack heights are greater than those listed in this memo.
Emission Release Parameters: NAAQS compliance is assured provided stack parameters of exhaust temperatures and flow rates 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.
Required Characteristics of Co-Contributing Rock Crushing Plant: The crushing plant must have a throughput of not more than 25,000 ton/month and not operate any IC engines powering electrical generators.	The permit must not allow operation of the HMA plant at the Dixie River site if the rock crushing plant does not meet the throughput and engine restrictions.
P-2018.0021 Concrete Batch Plant	
Criteria/Assumption/Result	**Explanation/Consideration**
Dixie River Pit Location: The CBP truck loadout source was modeled at 519,130 meters Easting, 4,837,832 meters Northing, zone 11.	NAAQS is only demonstrated for the layout modeled. Locations of sources will be considered representative provided the CBP loadout source is within 100 feet of the modeled location.
Operation with a Co-Contributing HMA Plant and Rock Crushing Plant at the Dixie River Pit: The CBP was modeled with simultaneous operation of the Dixie River HMA Plant (Facility ID: 777-00586) as described in modified PTC P-2018.0029 Project 62061 for the Dixie River Pit. The CBP was also modeled with simultaneous operation of a rock crushing plant with a 25,000 ton/month throughput and no operation of IC engines powering generators.	It is not necessary for the CBP PTC to preclude operation of a rock crushing plant within 1,000 feet of the CBP.
Source Setback from Ambient Air: Site-specific impact modeling was performed, using the ambient air boundary described by the applicant and planned specific locations of the HMA plant, CBP, and rock crushing plant.	Specified setbacks in the existing permit are no longer necessary because modeling was performed for the actual equipment configuration at the Dixie River site; however, emission sources must be located where they were represented in the air impact model.

2.0 Background Information

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

2.1 Project Description, Proposed Location, and Area Classification

This memo addresses two permitting projects, allowing co-location and simultaneous operation of a HMA Plant, CBP, and rock crushing plant at the Dixie River Pit, about 4 miles northwest of Caldwell, Idaho. The CBP is regulated by PTC P-2018.0021, also for location at the Dixie River Pit. The current permit does not allow simultaneous operation with a rock crushing plant within 1,000 feet. The HMA Plant is regulated by PTC P-2018.0029, allowing the plant to operate as a portable facility. The current permit does not allow simultaneous operation with a CBP or rock crushing plant, and the permit does not allow the plant to remain at any one site for more than 1 year. The existing PTCs for the HMA Plant and the CBP must be modified to provide special permit conditions when the three facilities are operating together at the Dixie River Pit.

2.2 Air Impact Analyses Required for All Permits to Construct

Criteria Pollutant and TAP Impact Analyses for a PTC are addressed in Idaho Air Rules Sections 203.02 and 203.03:

> *No permit to construct shall be granted for a new or modified stationary source unless the applicant shows to the satisfaction of the Department all of the following:*
>
> ***02. NAAQS****. The stationary source or modification would not cause or significantly contribute to a violation of any ambient air quality standard.*
>
> ***03. Toxic Air Pollutants.*** *Using the methods provided in Section 210, the emissions of toxic air pollutants from the stationary source or modification would not injure or unreasonably affect human or animal life or vegetation as required by Section 161. Compliance with all applicable toxic air pollutant carcinogenic increments and toxic air pollutant non-carcinogenic increments will also demonstrate preconstruction compliance with Section 161 with regards to the pollutants listed in Sections 585 and 586.*

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

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

2.3 Significant Impact Level and Cumulative NAAQS Impact Analyses

The SIL analysis for a new facility or proposed modification to a facility involves modeling estimated criteria air pollutant emissions from the facility or modification to determine the potential impacts to ambient air. Air impact analyses are required by Idaho Air Rules to be conducted according to methods outlined in Appendix W. Appendix W requires that facilities be modeled using emissions and operations representative of design capacity or as limited by a federally enforceable permit condition.

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

If modeled maximum pollutant impacts to ambient air from the emissions sources associated with a new facility or modification exceed the SILs, then a cumulative NAAQS impact analysis is necessary to demonstrate compliance with NAAQS and Idaho Air Rules Section 203.02.

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

If the cumulative NAAQS impact analysis indicates a violation of the standard, the permit may not be issued if the proposed project has a significant contribution (exceeding the SIL) to the modeled violation. This evaluation is made specific to both time and space. As an example, consider a hypothetical case where the SIL analysis indicates the project (new source or modification) has impacts exceeding the SIL and the cumulative impact analysis indicates a violation of the NAAQS. If project-specific impacts are below the SIL at the specific receptors showing the violations during the time periods when modeled violations occurred, then the project does not have a significant contribution to the specific violations.

Table 2. APPLICABLE REGULATORY LIMITS

Pollutant	Averaging Period	Significant Impact Levels[a] (µg/m³)[b]	Regulatory Limit[c] (µg/m³)	Modeled Design Value Used[d]
PM_{10}[e]	24-hour	5.0	150[f]	Maximum 6th highest[g]
$PM_{2.5}$[h]	24-hour	1.2	35[i]	Mean of maximum 8th highest[j]
	Annual	0.2	12[k]	Mean of maximum 1st highest[l]
Carbon monoxide (CO)	1-hour	2,000	40,000[m]	Maximum 2nd highest[n]
	8-hour	500	10,000[m]	Maximum 2nd highest[n]
Sulfur Dioxide (SO_2)	1-hour	3 ppb[o] (7.8 µg/m³)	75 ppb[p] (196 µg/m³)	Mean of maximum 4th highest[q]
	3-hour	25	1,300[m]	Maximum 2nd highest[n]
Nitrogen Dioxide (NO_2)	1-hour	4 ppb (7.5 µg/m³)	100 ppb[r] (188 µg/m³)	Mean of maximum 8th highest[s]
	Annual	1.0	100[t]	Maximum 1st highest[n]
Lead (Pb)	3-month[u]	NA	0.15[t]	Maximum 1st highest[n]
	Quarterly	NA	1.5[t]	Maximum 1st highest[n]
Ozone (O_3)	8-hour	40 TPY VOC[v]	70 ppb[w]	Not typically modeled

a. Idaho Air Rules Section 006 (definition for significant contribution) or as incorporated by reference as per Idaho Air Rules Section 107.03.b.
b. Micrograms per cubic meter.
c. Incorporated into Idaho Air Rules by reference, as per Idaho Air Rules Section 107.
d. The maximum 1st highest modeled value is always used for the significant impact analysis unless indicated otherwise. Modeled design values are calculated for each ambient air receptor.
e. Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers.
f. Not to be exceeded more than once per year on average over 3 years.
g. Concentration at any modeled receptor when using five years of meteorological data.
h. Particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers.
i. 3-year mean of the upper 98th percentile of the annual distribution of 24-hour concentrations.
j. 5-year mean of the 8th highest modeled 24-hour concentrations at the modeled receptor for each year of meteorological data modeled. For the SIL analysis, the 5-year mean of the 1st highest modeled 24-hour impacts at the modeled receptor for each year.
k. 3-year mean of annual concentration. The NAAQS was revised from 15 µg/m³ to12 µg/m³ on December 14, 2012. However, this standard will not be applicable for permitting purposes in Idaho until it is incorporated by reference *sine die* into Idaho Air Rules (Spring 2014).
l. 5-year mean of annual averages at the modeled receptor.
m. Not to be exceeded more than once per year.
n. Concentration at any modeled receptor.
o. Interim SIL established by EPA policy memorandum.
p. 3-year mean of the upper 99th percentile of the annual distribution of maximum daily 1-hour concentrations.
q. 5-year mean of the 4th highest daily 1-hour maximum modeled concentrations for each year of meteorological data modeled. For the significant impact analysis, the 5-year mean of 1st highest modeled 1-hour impacts for each year is used.
r. 3-year mean of the upper 98th percentile of the annual distribution of maximum daily 1-hour concentrations.
s. 5-year mean of the 8th highest daily 1-hour maximum modeled concentrations for each year of meteorological data modeled. For the significant impact analysis, the 5-year mean of maximum modeled 1-hour impacts for each year is used.
t. Not to be exceeded in any calendar year.
u. 3-month rolling average.
v. An annual emissions rate of 40 ton/year of VOCs is considered significant for O_3.
w. Annual 4th highest daily maximum 8-hour concentration averaged over three years.

Compliance with Idaho Air Rules Section 203.02 is generally demonstrated if: a) applicable specific criteria pollutant emission increases are at a level defined as BRC, using the criteria established by DEQ regulatory interpretation[1] (see Section 3.1.1 of this memorandum); or b) all modeled impacts of the SIL analysis are below the applicable SIL or other level determined to be inconsequential to NAAQS compliance; or c) modeled design values of the cumulative NAAQS impact analysis (modeling all emissions from the facility and co-contributing sources, and adding a background concentration) are less than applicable NAAQS at receptors where impacts from the proposed facility/modification exceeded the SIL or other identified level of consequence; or d) if the cumulative NAAQS analysis showed NAAQS violations, the impact of proposed facility/modification to any modeled violation was inconsequential (typically assumed to be less than the established SIL) for that specific receptor and for the specific modeled time when the violation occurred.

2.4 Toxic Air Pollutant Analyses

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

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

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

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

Per Section 210, if the total project-wide emissions increase of any TAP associated with a new source or modification exceeds screening emission levels (ELs) of Idaho Air Rules Section 585 or 586, then the ambient impact of the emissions increase must be estimated. If ambient impacts are less than applicable Acceptable Ambient Concentrations (AACs) for non-carcinogens of Idaho Air Rules Section 585 and Acceptable Ambient Concentrations for Carcinogens (AACCs) of Idaho Air Rules Section 586, then compliance with TAP requirements has been demonstrated.

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

3.0 Analytical Methods and Data

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

3.1 Emission Source Data

Emissions of criteria pollutants and TAPs resulting from operation of the three applicable facilities at the Dixie River Pit were calculated by DEQ for various applicable averaging periods. DEQ's HMA plant and CBP emission calculation spreadsheets were used to calculate emissions for the proposed configuration of the facilities, given the specified equipment and requested operational rates. Emissions from the rock crushing facility were modeled as a co-contributing source and emissions were calculated as described in this section and in Attachment 1 of this memorandum. DEQ air impact analyses assured that the estimated potential emissions rates were properly used in the model. The rates listed must represent the maximum allowable rate as averaged over the specified period.

Emissions rates used in the dispersion modeling analyses, as listed in this memorandum, should be reviewed by the DEQ permit writer and compared with those in the final emissions inventory used in the DEQ Statement of Basis. All modeled criteria air pollutant and TAP emissions rates must be equal to or greater than the facility's potential emissions calculated in the PTC emissions inventory or proposed permit allowable emission rates. Emissions from the rock crushing plant were treated as a co-contributing facility, with emissions estimated at a level considered as reasonably conservative. The DEQ modeling group calculated emissions associated with the rock crushing plant based on information provided by the applicant and these calculations are described in more detail in Attachment 1.

3.1.1 Criteria Pollutant Emissions Rates and Modeling Applicability

Exclusion of BRC Sources from NAAQS Compliance Demonstration Requirements

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

The DEQ emission inventory asserts that facility-wide controlled PTE emissions of certain criteria pollutants are above BRC levels, as listed in Table 3. The only emissions considered in this calculation are non-fugitive emissions from the three facilities, including: the drum dryer, asphalt heater, and asphalt silo loading for the HMA Plant; weigh-batcher baghouse, water heater, cement silo filling, and cement supplement silo filling for the CBP. Emissions from material handling of aggregate and asphalt, cement truck loadout, and rock crushing emissions are considered fugitive, and as such were excluded from permit-applicability PTE.

Table 4 lists criteria pollutant emission rates used in the DEQ site-specific impact modeling analyses for the specified HMA Plant. Table 5 lists criteria pollutant emission rates used in the analyses for the CBP, and Table 6 lists rates for the rock crushing plant. Attachment 1 provides additional details of DEQ emission calculations used in the impact modeling analyses.

Table 3. CRITERIA POLLUTANT NAAQS COMPLIANCE DEMONSTRATION APPLICABILITY			
Criteria Pollutant	**BRC Level (ton/year)**	**Applicable Facility Wide PTE Emissions (ton/year)**	**Air Impact Analyses Required?**
PM_{10}[a]	1.5	2.2	Yes
$PM_{2.5}$[b]	1.0	2.1	Yes
Carbon Monoxide (CO)	10.0	12.1	Yes
Sulfur Dioxide (SO_2)	4.0	7.9	Yes
Nitrogen Oxides (NOx)	4.0	5.9	Yes
Lead (Pb)	0.06	0.0095	No
Ozone (as VOC)	4.0	2.9	No

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

Table 4. HMA PLANT EMISSIONS USED IN DEQ ANALYSES			
Emissions Point in Model	**Pollutant**	**Averaging Period**	**Emissions Rate (lb/hr)**[a]
HMA_DRY – asphalt drum dryer/mixer - emissions controlled by a baghouse	$PM_{2.5}$	24-hour	1.673[b]
		Annual	0.4455[c]
	PM_{10}	24-hour	1.725[b]
	NOx	1-hour	8.250
		Annual	1.099[c]
	SO_2	1-hour	13.35
	CO	1-hour	19.50
HMA_SILOLOAD – loading of asphalt storage silo	$PM_{2.5}$	24-hour	0.04394[b]
		Annual	0.01170[c]
	PM_{10}	24-hour	0.04394[b]
	CO	1-hour	0.1770
HMA_ASP_LOAD – asphalt loadout from silo to truck	$PM_{2.5}$	24-hour	0.03915[b]
		Annual	0.01043[c]
	PM_{10}	24-hour	0.03915[b]
	CO	1-hour	0.2024
HMA_HEATER – asphalt oil heater	$PM_{2.5}$	24-hour	0.005619[b]
		Annual	0.005619[c]
	PM_{10}	24-hour	0.008392[b]
	NOx	1-hour	0.1751
		Annual	0.08997[c]
	SO_2	1-hour	0.05181
	CO	1-hour	0.03649
HMA_AGGHAND – aggregate handling by frontend loader and conveyor transfers	$PM_{2.5}$	24-hour	0.03920[b,d]
		Annual	0.01044[c,d]
	PM_{10}	24-hour	0.2589[b,d]
HMA_SCREEN – scalping screen	$PM_{2.5}$	24-hour	0.0009360[b]
		Annual	0.0002493[c]
	PM_{10}	24-hour	0.06264[b]

a. Pounds per hour emission rate used in impact modeling analyses for specified averaging periods.
b. Calculated by multiplying the daily throughput or daily operational hours by the emission factor, then dividing by 24.
c. Emissions rate is equal to annual emissions divided over 8,760 hours/year.
d. Emissions are varied in the model according to wind speed category (see Attachment 1). Emissions listed are based on a 10 miles/hour (mph) wind speed.

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

Table 5. CBP EMISSIONS USED IN DEQ ANALYSES

Emissions Point in Model	Pollutant	Averaging Period	Emissions Rate (lb/hr)[a]
CBP_CSILO – cement silo loading	$PM_{2.5}$	24-hour	0.001800[b]
		Annual	0.001284[c]
	PM_{10}	24-hour	0.005008[b]
CBP_SSILO – supplement silo loading	$PM_{2.5}$	24-hour	0.002700[b]
		Annual	0.001926[c]
	PM_{10}	24-hour	0.01073[b]
CBP_WEIGBATC – weigh batcher baghouse	$PM_{2.5}$	24-hour	0.0007110[b]
		Annual	0.0005073[c]
	PM_{10}	24-hour	0.002371[b]
CBP_WHEAT – hot water heater	$PM_{2.5}$	24-hour	0.01267[b]
		Annual	0.01267[c]
	PM_{10}	24-hour	0.01267[b]
	NOx	1-hour	0.1667
		Annual	0.1667[c]
	SO_2	1-hour	0.001000
	CO	1-hour	0.140
CBP_LOAD – truck loadout	$PM_{2.5}$	24-hour	0.5676[b]
		Annual	0.4050[c]
	PM_{10}	24-hour	0.9449[b]
CBP_GL_AGG – ground level sand and aggregate handling	$PM_{2.5}$	24-hour	0.01834[b,d]
		Annual	0.01309[c,d]
	PM_{10}	24-hour	0.1127[b,d]
CBP_EL_AGG – elevated sand and aggregate handling	$PM_{2.5}$	24-hour	0.009172[b,d]
		Annual	0.006543[c,d]
	PM_{10}	24-hour	0.05633[b,d]

a. Pounds per hour emission rate used in modeling analyses for specified averaging periods.
b. Calculated by multiplying the daily throughput or daily operational hours by the emission factor, then dividing by 24.
c. Emissions rate is equal to annual emissions divided over 8760 hours/year (hours in a year).
d. Emissions are varied in the model according to wind speed category. Emissions listed are based on a 10 mph wind speed.

Emissions from material handling associated with the CBP were grouped into two volume sources. CBP_GL_AGG is ground level material handling emissions and includes: 1) loader transfers of aggregate and sand to ground storage; 2) loader transfers of aggregate and sand to a hopper. CBP_EL_AGG is elevated material handling emissions and includes the transfer of aggregate and sand to elevated storage.

Table 6. ROCK CRUSHING PLANT EMISSIONS USED IN DEQ ANALYSES			
Emissions Point in Model	**Pollutant**	**Averaging Period**	**Emissions Rate (lb/hr)[a]**
RC_AREA1 – rock crushing plant (crushing, screening, and conveyors), section 1	$PM_{2.5}$	24-hour	0.001868[b]
		Annual	0.09201[c]
	PM_{10}	24-hour	1.236[b]
RC_AREA2 – rock crushing plant (crushing, screening, and conveyors), section 2	$PM_{2.5}$	24-hour	0.001868[b]
		Annual	0.09201[c]
	PM_{10}	24-hour	1.236[b]

a. Pounds per hour emission rate used in modeling analyses for specified averaging periods.
b. Calculated by multiplying the daily throughput or daily operational hours by the emission factor, then dividing by 24.
c. Emissions rate is equal to annual emissions divided over 8760 hours/year (hours in a year).

Emissions from the rock crushing plant were calculated based on 25,000 ton/month (the stated throughput obtained from the applicant). Daily emissions were based on double the monthly average throughput [(25,000 ton/month)(month/30 days)(2)] and annual emissions were based on 300,000 ton/year [(12 months)(25,000 ton/month)]. Emission generating activities associated with the crusher included: 1) 2 crushers; 2) 3 screens; 3) 4 conveyor transfers. Total emissions were evenly divided among two volume sources: RC_AREA1 and RC_AREA2.

Exclusion from Impact Analyses by Modeling Thresholds

DEQ may determine that reasonably expected impacts from specific criteria pollutant emissions, for those pollutants not excluded from analysis by DEQ's regulatory interpretation policy of exemption provisions (discussed above), are so minimal that NAAQS compliance is assured without the need to perform a project-specific impact analysis. Modeling applicability threshold emission values were established to evaluate the level below which NAAQS compliance is effectively assured. These thresholds are established in the *Idaho Air Quality Modeling Guideline*[2] (http://www.deq.idaho.gov/media/1029/modeling-guideline.pdf). Modeling thresholds, for criteria pollutants other than Pb, were developed to ensure modeled impacts are less than the SIL for sources with good dispersion characteristics (at least as good as those associated with the source modeled for generation of the thresholds). The modeling threshold for Pb was set to assure compliance with the NAAQS, since there is no SIL for Pb.

Total project emissions are provided in Table 7 along with Level I and Level II Modeling Applicability Thresholds.

Estimated emissions exceed Level I Modeling Thresholds by a considerable margin. Level II Modeling Thresholds are not appropriate for PM_{10} and $PM_{2.5}$ because of the poor dispersion characteristics of fugitive particulate emissions. Level II Modeling Thresholds are questionably appropriate for CO, NOx, and SO_2 emissions from the dryer stack. As compared to parameters in the modeling used to develop Level II thresholds, the HMA sources have a slightly shorter stack height, but will still achieve good dispersion from the high volume of hot exhaust from the drum dryer. Emissions are also distributed among three different sources rather than a single, concentrated point. Additionally, the thresholds are designed to assure an impact below the SIL, and estimated emissions are facility-wide. Therefore, impacts slightly above the SIL would still almost certainly still result in a cumulative impact well below NAAQS. Allowable emissions of 1-hour CO and annual NOx were substantially below the Level II Modeling Threshold and project-specific air impact analyses were not performed for those pollutants.

Table 7. EMISSION COMPARISONS TO MODELING THRESHOLDS				
Pollutant / Averaging Period	**Emission Rate[a]**	**Level I Threshold[b]**	**Level II Threshold[c]**	**Project-Specific Air Impact Analyses Required**
PM_{10}[d] 24-hour	3.3 lb/hr	0.22 lb/hr	2.6 lb/hr	Yes
$PM_{2.5}$[d] 24-hour	2.44 lb/hr	0.054 lb/hr	0.63 lb/hr	Yes
$PM_{2.5}$[d] annual	4.1 ton/yr	0.35 ton/yr	4.1 ton/yr	Yes
CO[e] 1-hour, 8-hour	20 lb/hr	15 lb/hr	175 lb/hr	No[h]
NOx[f] 1-hour	8.59 lb/hr	0.20 lb/hr	2.4 lb/hr	Yes
NOx[f] annual	1.4 ton/yr	1.2 ton/yr	14 ton/yr	No[h]
SO_2[g] 1-hour	13.4 lb/hr	0.21 lb/hr	2.5 lb/hr	Yes

a. Emission rate in either pounds/hour (lb/hr) over the specified time period or ton/year (ton/yr) over the specified time period.
b. Level I Modeling Applicability Thresholds are unconditional.
c. Level II Modeling Applicability Thresholds require DEQ approval and are dependent on the use of parameters that would result in dispersion as good or better than parameters used in modeling used to generate Level II thresholds. DEQ determined Level II thresholds cannot be used for this project.
d. Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers.
e. Particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers.
f. Nitrogen oxides.
g. Sulfur dioxide.
h. DEQ determined Level II thresholds were appropriate for this pollutant.

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

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

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

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

Secondary Particulate Formation

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

3.1.2 Toxic Air Pollutant Emissions Rates

TAP emissions regulations under Idaho Air Rules Section 220 are only applicable for new or modified sources constructed after July 1, 1995. The HMA plant and the CBP both operate under valid DEQ permits, and TAP analyses were performed for the permits issued. Table 8 lists emission rates used in the TAP impact analyses. The existing HMA plant permit required relocation every 12 months, thereby allowing use of a short-term AACC adjustment upward by a factor of 10, as directed by Idaho Air Rules Section 210.15. A TAP assessment was needed for this modification since the HMA plant will remain at the Dixie River site for more than a short-term period. The TAP impact analyses include carcinogenic TAPs from both the HMA plant and CBP.

Table 8. TAP EMISSIONS USED IN DEQ ANALYSES				
HMA Plant				
TAP	**Averaging Period**[a]	**Emissions (lb/hr)**[b]		
		HMA_DRY[c]	**HMA_SILOLOAD**[d]	**HMA_ASP_LOAD**[e]
Acetaldehyde	Annual	2.597E-2		
Benzene	Annual	7.791E-3	7.791E-5	4.320E-5
Formaldehyde	Annual	6.193E-2	1.680E-3	7.311E-5
Naphthalene	Annual	1.299E-2	9.231E-5	8.514E-5
Fluorene	Annual	2.197E-4	5.123E-5	5.244E-5
Phenanthrene	Annual	4.595E-4	9.130E-5	5.517E-5
POM	Annual	1.094E-5	1.349E-5	9.191E-6
Arsenic	Annual	1.119E-5		
Cadmium	Annual	8.191E-6		
Chromium 6+	Annual	8.990E-6		
Nickle	Annual	1.259E-3		
CBP				
TAP	**Averaging Period**	**CBP_LOAD**[f]	**CBP_CSILO**[g]	**CBP_SSILO**[h]
Arsenic	Annual	2.946E-5	4.456E-8	1.563E-6
Cadmium	Annual	8.257E-8	2.459E-6	3.094E-10
Chromium 6+	Annual	5.861E-6	6.095E-8	5.719E-7
Nickle	Annual	2.873E-5	4.393E-7	3.563E-6

a. Maximum annual emissions are used for carcinogenic TAPs listed in Idaho Air Rules Section 586, and maximum 24-hour emissions are used for noncarcinogenic TAPs listed in Idaho Air Rules Section 585.
b. Maximum emissions for the averaging period of the TAP increment, expressed as pounds/hour.
c. Drum Dryer
d. Loading of asphalt storage silo.
e. Asphalt loadout from storage silo.
f. Truck loadout of aggregate, sand, and cement.
g. Cement silo loading.
h. Cement supplement silo loading.

3.1.3 Emissions Release Parameters

Table 9 provides emission release parameters for the HMA plant used in the analyses, including stack height, stack diameter, exhaust temperature, and exhaust velocity. Additional details are provided in Attachment 1. Table 10 provides release parameters for the CBP and Table 11 provides release parameters for the rock crushing plant.

Asphalt silo filling and loadout at the HMA plant were modeled as point sources, rather than volume sources, to account for thermal buoyancy of the emissions plume. Release parameters for asphalt silo filling and loadout were based on the following:

- Release point of asphalt silo filling was set to a typical height of a storage silo (30 feet) 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 a typical silo. Model-calculated stack tip downwash will account for downwash affects potentially caused by the silo.
- 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.

Table 9. HMA PLANT EMISSION RELEASE PARAMETERS

Release Point /Location	Source Type	Stack Height (m)[a]	Modeled Diameter (m)[a]	Stack Gas Temp. (K)[b]	Stack Gas Flow Velocity (m/sec)[c]
HMA_DRY	Point	6.1 (20 ft)	1.04 (3.4 ft)	408 (275 °F)	17.6 (58 fps)
HMA_HEATER	Point	2.4 (8.0 ft)	0.08 (0.3 ft)	436 (325 °F)	10.3 (34 fps)
HMA_SILOLOAD	Point	9.0 (30 ft)	3.0 (9.8 ft)	346 (163 °F)	0.1
HMA_ASP_LOAD	Point	3.5 (11.5 ft)	3.0 (9.8 ft)	346 (163 °F)	0.1
Volume Sources					
Release Point /Location	**Source Type**	**Release Height (m)[a]**	**Initial Horizontal Dispersion Coefficient σ_{y0} (m)**	**Initial Vertical Dispersion Coefficient σ_{z0} (m)**	
HMA_AGGHAND	Volume	2.5 (8.2)	4.65	1.16	
HMA_SCREEN	Volume	3.0 (9.8)	0.93	2.33	

a. Meters. Values in parentheses are in feet.
b. Kelvin. Values in parentheses are in degrees Fahrenheit.
c. Meters per second. Values in parentheses are in feet/second.

Table 10. CBP EMISSION RELEASE PARAMETERS					
Release Point /Location	**Source Type**	**Stack Height (m)[a]**	**Modeled Diameter (m)[a]**	**Stack Gas Temp. (K)[b]**	**Stack Gas Flow Velocity (m/sec)[c]**
CBP_CSILO	Point	22.9 (75 ft)	0.61 (2.0 ft)	0.0	3.2 (20.5 ft/sec)
CBP_SSILO	Point	22.9 (75 ft)	0.61 (2.0 ft)	0.0	3.2 (20.5 ft/sec)
CBP_WHEAT	Point	1.31 (4.3 ft)	0.30 (1.0 ft)	450 (350 ^{o}F)	3.9 (12.8 ft/sec)
CBP_WEIGBATC	Point	3.0 (9.8 ft)	1.00 (3.3 ft)	0.0	1.0 (3.3 ft/sec)
Volume Sources					
Release Point /Location	**Source Type**	**Release Height (m)[a]**	**Initial Horizontal Dispersion Coefficient σ_{y0} (m)**	**Initial Vertical Dispersion Coefficient σ_{z0} (m)**	
CBP_LOAD	Volume	3.75 (12.3 ft)	2.33	3.49	
CBP_GLAGG	Volume	2.0 (6.6 ft)	2.33	0.70	
CBP_ELAGG	Volume	5.0 (16.4 ft)	2.33	4.65	

a. Meters. Values in parentheses are in feet.
b. Kelvin. Values in parentheses are in degrees Fahrenheit.
c. Meters per second. Values in parentheses are in feet/second.

CBP emissions point release parameters were based on information provided by the applicant in the previous permitting analyses for permit P-2018.0021 Project 62016. Using the silo bin vent volumetric flow rate of 1,860 actual feet^3/minute (acfm) and an effective stack release diameter of 2.0 feet (square stack, 12 inches by 36 inches) as provided in the application, a stack exhaust flow velocity of 3.2 meters/second was calculated. The vents were modeled using an exhaust temperature of 0 Kelvin, which triggers the model to set the release temperature equal to the ambient air temperature. This eliminates thermal buoyancy of the plume. The accuracy of flow parameters (other than stack height) for these vents is not critical since emissions are relatively low and are emitted at a large height above groundlevel.

Emissions from truck loadout of dry concrete, fly ash, and aggregate were modeled as a volume source. The release height was set at 3.75 meters, the typical height of cement truck feed chutes. The initial horizontal dimension (σ_{yo}) was set at a value equal to the length of the source's side divided by 4.3, as directed by EPA guidance for AERMOD[3]. The length of side was set to 10 meters to represent the structure of the plant and any adjacent building, and σ_{yo} was calculated at 2.33 meters. The initial vertical dimension (σ_{zo}) was set at a value equal to the vertical extent of the source or the height of an adjacent building divided by 2.15, as directed by EPA guidance for AERMOD. The vertical extent of the volume source was set at two times the release height (7.5 meters), giving a σ_{zo} of 3.49 meters.

The heater exhaust release parameters of stack height, stack diameter, and exhaust temperature were provided by the applicant in the application forms. An exhaust temperature of 7,250 ^{o}F was provided on the forms. DEQ determined this was not reasonably accurate for the heater and used a value of 350 ^{o}F, which is more typical for these type of sources. DEQ calculated an exhaust flow of 600 acfm using a combustion evaluation calculation, assuming no excess air. A flow velocity of 3.9 meters/second (12.7 feet/second) was calculated by using the 600 acfm flow for the exhaust with the 1.0 feet stack diameter.

Table 11. ROCK CRUSHING PLANT EMISSION RELEASE PARAMETERS				
Release Point /Location	**Source Type**	**Release Height (m)**	**Initial Horizontal Dispersion Coefficient σ_{y0} (m)**	**Initial Vertical Dispersion Coefficient σ_{z0} (m)**
RC_AREA1	Volume	3.0 (9.8 ft)	11.6	1.4
RC_AREA2	Volume	3.0 (9.8 ft)	11.6	1.4

a. Meters. Values in parentheses are in feet.

Operations of the rock crushing plant were modeled as two volume sources with dimensions of 50 meters X 50 meters, with a height of 6.0 meters. The release height of each volume source was set at 3.0 meters to reasonably account for emissions from elevated sources of crushers, screens, and conveyors.

3.2 Background Concentrations

Background concentrations are used if a cumulative NAAQS impact analysis is needed to demonstrate compliance with applicable NAAQS. A background concentration tool was used to establish ambient air background concentrations for this project. The design value (DV) background concentration tool is accessed from the Northwest International Air Quality Environmental Science and Technology Consortium (NW AIRQUEST: https://arcg.is/1jXmHH) using the project site coordinates. These background air pollutant levels are based on regional-scale air impact modeling of criteria pollutants in Washington, Oregon, and Idaho. The modeling was performed for years 2014-2017, using updated air pollutant emissions inventories and improved interpolation techniques. Modeled background values were adjusted by the tool according to available ambient monitoring data. The applicable background concentrations for the site are listed in Table 12.

Table 12. AMBIENT BACKGROUND CONCENTRATIONS AT THE LINKONE FACILITY.		
Pollutant	**Averaging Period**	**Background Concentration ($\mu g/m^3$)[a,b]**
$PM_{2.5}$[c]	24-hour	25.8
	Annual	7.4
PM_{10}[d]	24-hour	79.1
NO_2[e]	1-hour	58.5 (31.1 ppb[f])
SO_2[g]	1-hour	13.1 (5.0 ppb)

a. Micrograms per cubic meter, except where noted otherwise.
b. NW AIRQUEST ambient background lookup tool, 2014-2017.
c. Particulate matter with an aerodynamic diameter of 2.5 microns or less.
d. Particulate matter with an aerodynamic diameter of 10 microns or less.
e. Nitrogen dioxide.
f. Parts per billion by volume.
g. Sulfur dioxide.

3.3 Impact Modeling Methodology

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

3.3.1 General Overview of Analyses

DEQ performed non-site-specific analyses that were considered to be reasonably representative of the proposed site configuration of an HMA plant, CBP, and rock crushing plant. Results demonstrated compliance with applicable air quality standards to DEQ's satisfaction, provided emission points are located where indicated in the application and operational restrictions are maintained.

Site-specific modeling was used because of the co-location restrictions in the applicable HMA plant permit could not be met at the Dixie River site. Table 13 provides a brief description of parameters used in the impact modeling analyses.

Table 13. MODELING PARAMETERS

Parameter	Description/Values	Documentation/Addition Description
General Facility Location	Site-specific near Caldwell	Area not within non-attainment areas.
Model	AERMOD	AERMOD with the PRIME downwash algorithm, version 19191
Meteorological Data	Boise	See Section 3.3.5
Terrain	considered	1/3 arc second National Elevation Dataset (NED) was acquired from the USGS for the surrounding area. AERMAP version 19191 was used to process terrain elevation data for all buildings and receptors. See Section 3.3.5 for more details.
Building Downwash	Considered	No substantial structures were identified for the HMA plant or rock crushing plant in the application. Downwash for a CBP structure was considered in the analyses.
Receptor Grid	Grid 1	10-meter spacing along the ambient air boundary out to 50 meters.
	Grid 2	25-meter spacing out to 200 meters.
	Grid 3	50-meter spacing out to 500 meters.
	Grid 4	100-meter spacing out to 2,000 meters.
	Grid 5	200-meter spacing out to3,000 meters.
	Grid 6	500-meter spacing out to 5,000 meters.

3.3.2 Modeling protocol and Methodology

A modeling protocol was not submitted to DEQ prior to the application because DEQ performed the required air impact analyses. Site-specific modeling was generally conducted using data and methods described in the *State of Idaho Air Quality Modeling Guideline*.[2]

3.3.3 Model Selection

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

AERMOD version 19191 was used for the modeling analyses to evaluate impacts of the facility. This version was the current version at the time the application was received by DEQ.

3.3.4 Data and Parameters used for Modeling 1-Hour NO_2 with ARM2

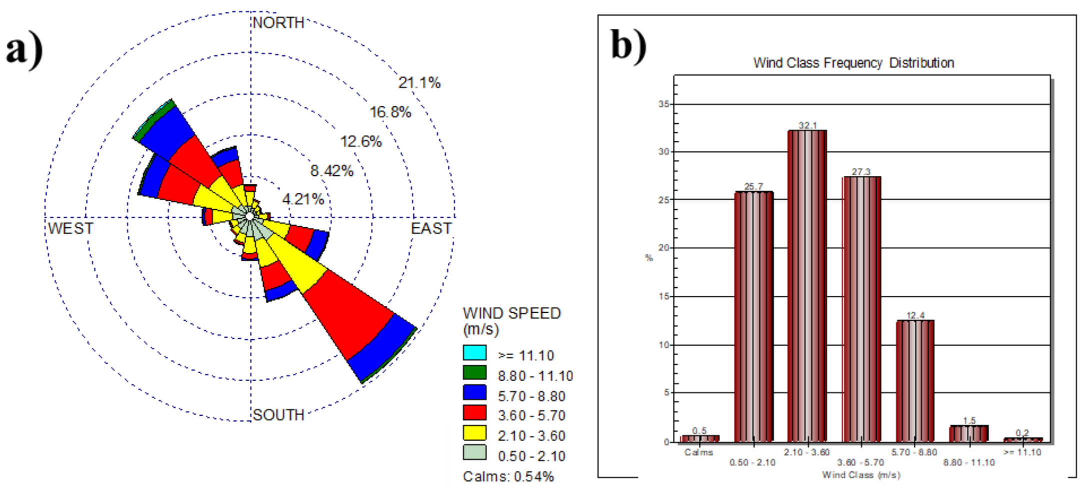
The Ambient Ratio Method 2 (ARM2) was used with AERMOD to provide a more refined estimate of 1-hour NO_2 concentrations at specific receptors. The default minimum ARM2 NO_2/NOx ratio of 0.5 used as well as the default maximum ratio of 0.9.

3.3.5 Meteorological Data

DEQ processed a meteorological dataset from Boise, Idaho (KBOI; station ID 726810-24131) covering the years 2014-2018. The upper air soundings required by AERMET were obtained from the Boise airport station (site ID 24131). Surface characteristics were determined by DEQ staff using AERSURFACE version 13016. DEQ modeling staff evaluated annual moisture conditions for the AERSURFACE runs based on thirty years of Boise airport precipitation data. Conditions were determined to be “wet” for 2014 and 2017, and “average” for 2015, 2016, and 2018. Average moisture content is defined as within a 30 percentile of the 30-year mean of 11.3 inches.

Figure 1 shows a wind rose and wind speed histogram at Boise Airport. On average, winds are dominated by southeasterlies with magnitudes of between 2.10 and 3.60 meters/second. Calms were relatively low at 0.54 percent, and less than 1.0 percent of the data were missing from the five-year record.

Figure 1. (a) WIND ROSE AND (b) WIND SPEED HISTOGRAM AT BOISE AIRPORT IN IDAHO (2014-2018).



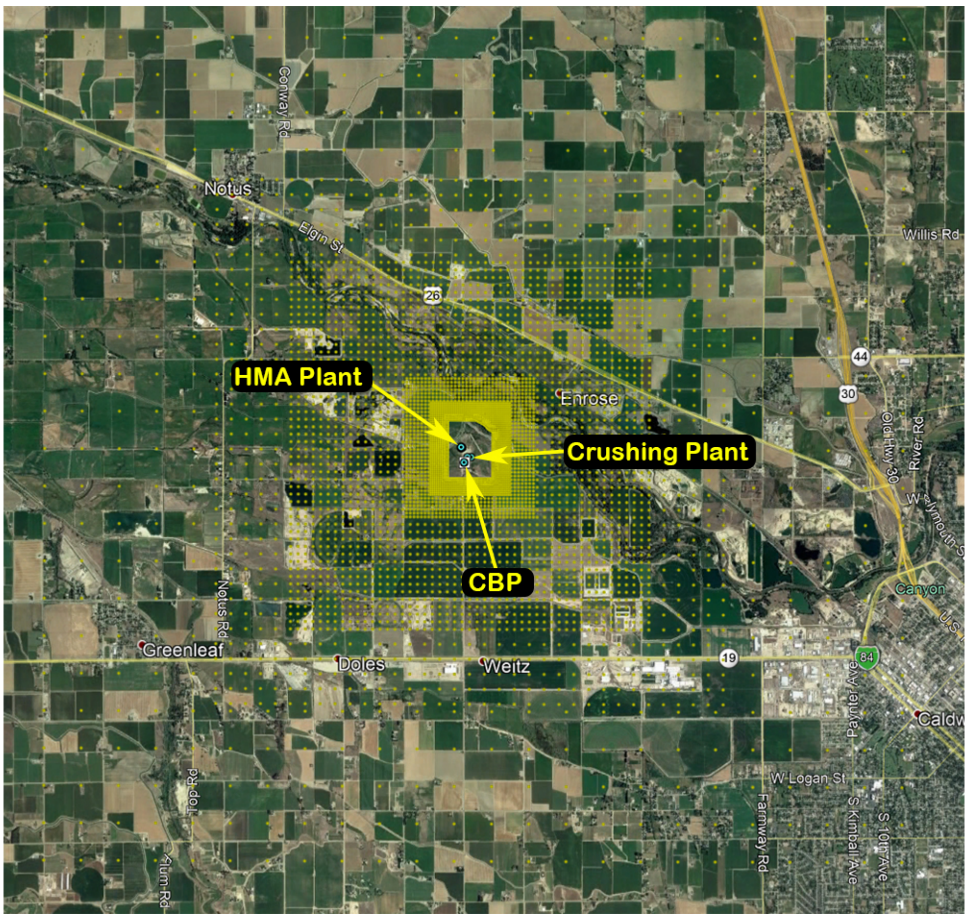
AERMINUTE version 15271 was used to process Automated Surface Observing Systems (ASOS) wind data for use in AERMET. AERMET version 19191 was used to process surface and upper air data and to generate a model-ready meteorological data input file. The “adjust u star” (ADJ_U*) option was applied in AERMET to enhance model performance during low wind speeds under stable conditions.

3.3.6 Effects of Terrain on Modeled Impacts

Ambient air impact analyses used terrain data extracted from United States Geological Survey (USGS) National Elevation Dataset (NED) files.

The terrain preprocessor AERMAP version 18081 was used by DEQ to extract the elevations from the NED files and assign them to receptors in the modeling domain in a format usable by AERMOD. AERMAP also determined the hill-height scale for each receptor. The hill-height scale is an elevation value based on the surrounding terrain which has the greatest effect on that individual receptor. AERMOD uses those heights to evaluate whether the emissions plume has sufficient energy to travel up and over the terrain or if the plume will travel around the terrain. Figure 2 depicts the full receptor grid used in the impact modeling analyses, overlaid on a terrain image from Google Earth.

Figure 2. EMISSION SOURCE LOCATIONS AND AMBIENT AIR RECEPTOR LOCATIONS USED IN THE IMPACT MODELING ANALYSES.



3.3.7 Facility Layout

Dixie River provided at aerial photograph showing the area controlled by the facility owner and the locations on the property of the HMA plant, CBP, and rock crushing plant. DEQ used this figure to determine geographical coordinates of emission sources for model input. Location of emission sources is a critical parameter that substantially affects impacts to ambient air. Results of these impact analyses cannot be considered representative of reasonably conservative impacts if the locations of the plants are different from what was used in the impact modeling by more than 100 feet. Figure 3 shows the positioning of the HMA plant, CBP, and rock crushing plant at the site.

Figure 3. EMISSION SOURCE LOCATIONS AND AMBIENT AIR BOUNDARY USED IN THE IMPACT MODELING ANALYSES.

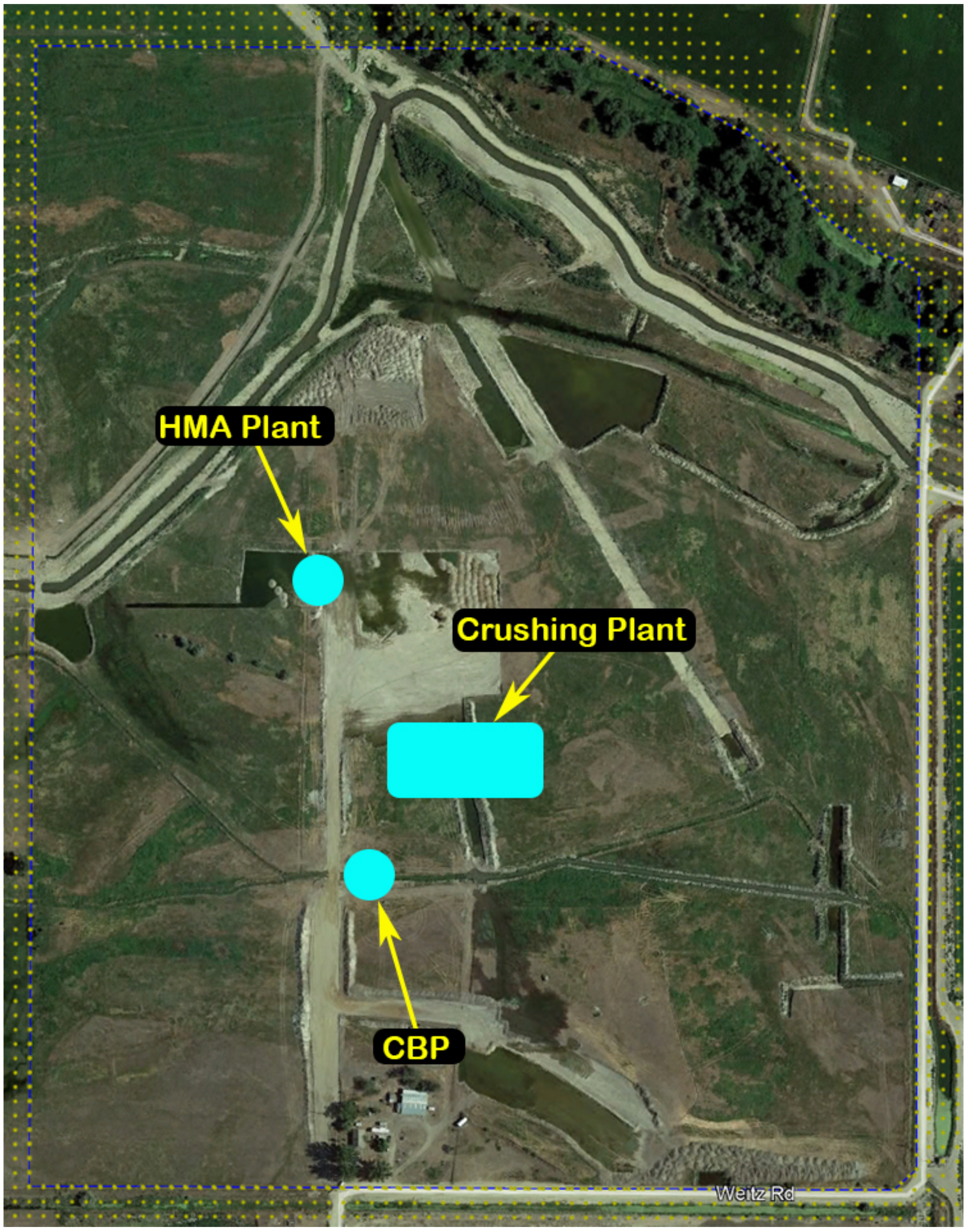


Table 14 lists coordinates of emission points used in the impact modeling analyses. The drum dryer stack of the HMA plant and the cement truck loadout point of the CBP were considered as the crucial points. defining the location of the plants. DEQ conservative modeled the sources of each plant in a rather tight grouping. This approach will likely result in greater overlap of impacts from individual sources. The drum dryer stack was established as the center of the HMA Plant, along with the volume source for aggregate handling by frontend loader and conveyors. The asphalt silo (silo loading and asphalt loadout), scalping screen, and the asphalt oil heater were located around the drum dryer stack, at only 7 meters from the dryer stack. The center of the truck loadout volume source was established as the center of the CBP, along with the weigh batcher baghouse stack and sand/aggregate handling to elevated storage. In a similar manner to that used for the HMA plant, the other CBP sources of the cement silo, supplement silo, water heater, and sand/aggregate ground-level handling were position around the loadout point at distances of about 7 meters. The rock crushing plant was modeled as two volume sources immediately north of the CBP.

Table 14. UTM COORDINATES OF MODELED RELEASE POINTS

Release Point	Description	Source Type	UTM Coordinates[a]	
			Easting (m)	Northing (m)
HMA_DRY[b]	Asphalt drum dryer	Point	519091	4838035
HMA_SILOLOAD	Loading of asphalt storage siolo	Point	519086	4838040
HMA_ASP_LOAD	Asphalt loadout from silo to truck	Point	519086	4838040
HMA_HEATER	Asphalt oil heater	Point	519086	4838030
HMA_AGGHAND	Aggregate handling by loader/conveyors	Volume	519091[c]	4838035[c]
HMA_SCREEN	Scalping screen	Volume	519096[c]	4838030[c]
CBP_CSILO	Cement silo loading	Point	519125	4837837
CBP_SSILO	Supplement silo loading	Point	519125	4837827
CBP_WHEAT	Water heater	Point	519135	4837837
CBP_WBATCH	Weigh batcher baghouse	Point	519130	4837832
CBP_LOAD[b]	Cement truck loadout	Volume	519130[c]	4837832[c]
CBP_GL_AGG	Ground level sand/aggregate handling	Volume	519130[c]	4837837[c]
CBP_EL_AGG	Elevated sand/aggregate handling	Volume	519130[c]	4837832[c]
RC_AREA1[b]	Rock crusher plant – area 1	Volume	519170[c]	4837907[c]
RC_AREA2[b]	Rock crusher plant – area 2	Volume	519220[c]	4837907[c]

a. Universal Transverse Mercator coordinates in zone 11.
b. Key release point identifying the location of the plant. Actual location should not vary by more than 100 feet (30 meters)
c. Coordinates for volume sources are at the center point of the volume source.

3.3.8 Effects of Building Downwash on Modeled Impacts

Most of the emission sources associated with the plants are not housed in buildings and are not subject to plume downwash as caused by typical building structures. However, a 10-meter by 10-meter building, 10 meters high was included in the model, centered on the CBP truck loadout source. No other substantial structures were identified for the site. Downwash effects from equipment or other minor structures at the site were not accounted for because much of the equipment is porous to wind, thereby minimizing downwash effects

3.3.9 Ambient Air Boundary

Ambient air is any area where the general public (anyone not under direct control of the permittee) has access. Areas can only be excluded from consideration as ambient air if the permittee has the legal right and practical ability to exclude the general public. Dixie River provided a figure with the application that identified the boundary to areas excluded from ambient air. The applicant indicated that additional areas to the northwest of the site are under direct control and could be excluded from ambient air. DEQ did not exclude this area from ambient air because it would be more difficult to preclude public access from this area since it is further removed from the area immediately surrounding the plants. Also, impacts in this area are not likely to affect the NAAQS compliance demonstration results. It was verified that maximum modeled impacts did not occur in any areas originally excluded from ambient air by the applicant-provided figure.

3.3.10 Receptor Network

Table 13 describes the receptor network used in the impact modeling analyses. The full grid, along with the fenceline receptors, includes a total of 6,792 receptors (Figure 2). The receptor grids used in the model provided good resolution of the maximum design concentrations for the project and provided extensive coverage. DEQ determined that the receptor grid used in the analyses was adequate to resolve maximum modeled impacts.

The receptor grid used in the impact modeling analyses met the minimum recommendations specified in the *Idaho Air Quality Modeling Guideline*[2], and DEQ determined that the receptor network was effective in reasonably assuring compliance with applicable air quality standards at all ambient air locations.

3.3.11 Crucial HMA Plant Characteristics Affecting Air Quality Impacts

Table 15 lists characteristics of the HMA plant, CBP, and rock crushing plant that are critical to the NAAQS and TAPs compliance demonstrations.

Table 15. IMPORTANT CHARACTERISTIC OF HMA PLANT USED IN DEQ ANALYSES

Parameter	Value or Description
HMA Plant	
HMA Plant Throughput Rates	150 ton/hr, 1,800 ton/day, 175,000 ton/yr
Plant Location	When operating at the Dixie River Pit, the HMA plant will be located on the site as indicated in the figure provided with the application and shown in Figure 3 of this memorandum. The drum dryer stack is positioned at UTM coordinates 519,091 meters Easting, 4,838,035 meters Northing, Zone 11, NAD 83 datum. Actual location of the dryer stack should not vary from the modeled position by more than 100 feet (30 meters)
Co-Contributing Sources	When operating at the Dixie River Pit, operation with a co-located CBP and rock crushing plant was assumed as described in this memorandum.
Drum Dryer	Drum dryer fueled by natural gas, propane, diesel, or residual fuel oil (RFO) with a baghouse for emissions control.
Electrical Power	Line power will be used when the HMA is at the Dixie River Pit. Generators powered by diesel-fired IC engines will not be used at the site
Dryer Stack Parameters	Stack height ≥20 ft, stack diameter ≈41 in, gas temp ≥ 275° F, flow velocity ≥58 ft/sec.
Asphalt Silo Filling	It was conservatively assumed that emissions are not captured and routed back to the drum dryer.
Conveyor Transfers	≤3 transfers for any given quantity of material processed. Emissions controlled by 90%.
Scalping Screen	≤1 screen for any given quantity of material processed. Emissions controlled by 90%.
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.
Temporary Source	The HMA plant was modeled as a permanent source. The previous permit required that the HMA plant relocate to a different pit every 12 months. When operating at the Dixie River Pit, this requirement is not necessary.
Seasonal Restriction	No seasonal restrictions were considered in the analyses.
CBP	
CBP Throughput Rates	1,440 yard^3/day, 375,000 yard^3/year
Plant Location	The CBP is located on the site as indicated in the figure provided with the application and shown in Figure 3 of this memorandum. The truck loadout source is positioned at UTM coordinates 519,130 meters Easting, 4,837,832 meters Northing, Zone 11, NAD 83 datum. Actual location of the truck loadout point should not vary from the modeled position by more than 100 feet (30 meters)
Emission Controls	Shroud with water mist ring on truck loadout point must be used when cement/aggregate is transferred from the CBP to a cement truck.
Co-Contributing Sources	When operating at the Dixie River Pit, operation with a co-located HMA plant and rock crushing plant was assumed as described in this memorandum.

Table 15. IMPORTANT CHARACTERISTIC OF HMA PLANT USED IN DEQ ANALYSES	
Parameter	**Value or Description**
Rock Crushing Plant	
Rock Crushing Plant Throughput Rates	25,000 ton/month maximum. Modeling assumed daily throughput was twice the average daily, or about 1,670 ton/day.
Electrical Power	Line power will be used when the rock crushing plant is operating at the Dixie River Pit. Generators powered by diesel-fired IC engines will not be used at the site

4.0 Impact Modeling Results

4.1 Results for NAAQS Cumulative Impact Analyses

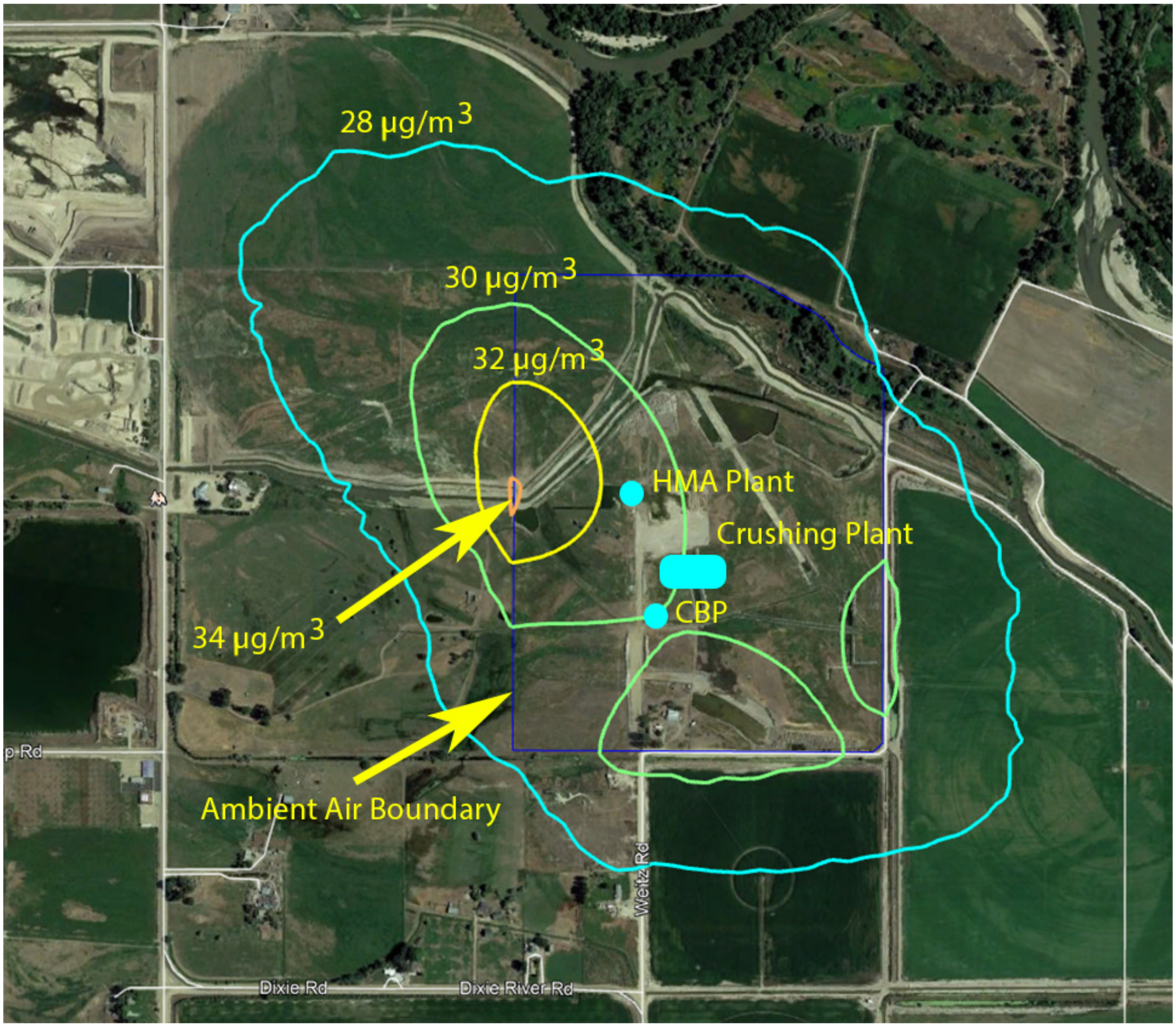
Table 16 provides site-specific air impact modeling results for NAAQS. DEQ determined NAAQS compliance is satisfactorily demonstrated. Although $PM_{2.5}$ impacts are very near the NAAQS, DEQ contends that impacts at that level would only happen if the maximum design value in background concentrations occurs simultaneously with maximum design value impacts from the plants modeled. It is highly unlikely that this condition would occur.

Table 16. RESULTS FOR CUMULATIVE IMPACT ANALYSES						
Pollutant	**Averaging Period**	**Modeled Design Value (μg/m³)[a]**	**Background Concentration (μg/m³)**	**Total Ambient Impact (μg/m³)**	**NAAQS[b] (μg/m³)**	**Percent of NAAQS**
PM_{10}[c]	24-hour	38.0[g]	79.1	117.1	150	78
$PM_{2.5}$[d]	24-hour	8.5[h]	25.8	34.3	35	98
	Annual	1.86[i]	7.4	9.26	12	77
NO_2[e]	1-hour	42.1[j]	58.5	100.6	188	54
SO_2[f]	1-hour	77.8[k]	13.1	90.9	196	46
	3-hour	88[l]	17	105	1,300	8

a. Micrograms per cubic meter.
b. National ambient air quality standards.
c. Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers.
d. Particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers.
e. Nitrogen dioxide.
f. Sulfur dioxide.
g. Modeled design value is the maximum modeled value of 6th highest 24-hour maximum impacts for a 5-year meteorological dataset.
h. Modeled design value is the maximum modeled value of 5-year means of 8th highest 24-hour impacts for a 5-year meteorological dataset.
i. Modeled design value is the maximum modeled value of 5-year means of annual impacts for a 5-year meteorological dataset.
j. Modeled design value is the maximum modeled value of 5-year means of 8th highest daily 1-hour maximum impacts for each year of a 5-year meteorological dataset.
k. Modeled design value is the maximum modeled value of 5-year means of 4th highest daily 1-hour maximum impacts for each year of a 5-year meteorological dataset.
l. Modeled design value is the maximum modeled value of 2nd highest 3-hour maximum impacts for a 5-year meteorological dataset.

Figure 4 shows 24-hour $PM_{2.5}$ design value concentrations with a 25.8 μg/m³ background level added to model impacts. Concentrations above 34 μg/m³ (97 percent of the NAAQS) are limited to a small area along the site boundary, west of the plant locations. Impacts exceeding 32 μg/m³ extend only as far as 200 feet west of the western site boundary; impacts exceeding 30 μg/m³ extend out almost as far as 600 feet along western boundary and less than 200 feet from the southern and eastern boundary. For concentrations to remain below 30 μg/m^3, impacts from the HMA plant, CBP, and rock crushing plant cannot exceed 9.2 μg/m^3 (because of the 25.8 μg/m^3 background).

Figure 4. $PM_{2.5}$ 24-HOUR DESIGN VALUE IMPACTS AT THE DIXIE RIVER SITE WITH BACKGROUND VALUES INCLUDED.



4.2 Results for TAP Impact Analyses

Results for site-wide TAP impact analyses are shown in Table 17. Maximum impacts of all TAPs are below applicable AACs and AACCs.

Table 17. RESULTS FOR TAPS IMPACT ANALYSES				
Pollutant	**Averaging Period**[a]	**Modeled Impact ($\mu g/m^3$)**[b]	**TAP Increment**[c] **($\mu g/m^3$)**	**Percent of Increment**
Acetaldehyde	5-year	5.45E-3	4.5E-1	1
Benzene	5-year	2.14E-3	1.2E-1	2
Formaldehyde	5-year	2.05E-2	7.7E-2	27
Naphthalene (as a PAH)[d]	5-year	3.47E-3	1.4E-2	25
Fluorene (as a PAH)[d]	5-year	4.81E-4	1.4E-2	3
Phenanthrene (as PAH)[d]	5-year	7.15E-4	1.4E-2	5
POM[e]	5-year	9.80E-5	3.0E-4	33
Arsenic	5-year	1.04E-4	2.3E-4	45
Cadmium	5-year	2.91E-6	5.6E-4	0.5
Chromium 6+	5-year	2.12E-5	8.3E-4	3
Nickle	5-year	3.15E-4	4.2E-3	8

a. A 5-year averaging period is conservatively used for carcinogenic TAPs of Idaho Air Rules Section 586. A 24-hour averaging period is used for non-carcinogenic TAPs of Idaho Air Rules Section 585.
b. Micrograms per cubic meter.
c. AACs listed in Idaho Air Rules Section 585 and AACCs listed in Idaho Air Rules Section 586.
d. Polyaromatic Hydrocarbon (PAH) compounds are regulated individually and compared to the PAH increment.
e. Polycyclic Organic Matter (POM) taken as the impact of emissions from seven listed compounds in Idaho Air Rules 586.

4.3 Locating with Other Facilities/Equipment

The air impact analyses performed by DEQ assumed there are no other emission sources (other than what was included in the impact model) 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 another rock crushing plant, another HMA plant, another CBP, or other pollutant-emitting 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 source/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.

Once the HMA plant and CBP is established at a site, the plant has no control over other facilities locating on neighboring properties (this does not include facilities locating on the same property as the HMA plant and CBP). Cumulative impacts would be assessed in the permitting analyses performed for the neighboring facility. The 1,000 foot restriction assumption on off-property co-contributing sources only applies when a portable plant is relocating to a new area or a new source is added on-property.

5.0 Conclusions

The ambient air impact analyses and other air quality analyses performed in support of the PTC applications demonstrated to DEQ’s satisfaction that emissions from the Dixie River HMA, the CBP, and rock crushing plant, when operating at the Dixie River site as described in this memorandum will not cause or significantly contribute to a violation of any ambient air quality standard.

References

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

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

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

ATTACHMENT 1

EMISSIONS CALCULATIONS AND MODELING PARAMETERS FOR

DEQ'S AIR IMPACT ANALYSES

HMA Plant Modeled Emissions Rates

Compliance determination is linked to throughput levels and the equipment configuration at the site.

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

DEQ's HMA plant spreadsheet to calculate emissions rates for various averaging periods.

Aggregate Handling Emissions

Emissions from aggregate handling were calculated for the following transfers: 1) aggregate to a storage pile by frontend loader; 2) aggregate from a pile to a hopper by frontend loader; 3) three conveyor transfers.

PM_{10} and $PM_{2.5}$ emissions associated with the handling of aggregate materials were calculated using emissions factors from AP42 Section 13.2.4.

Emissions were calculated using the following emissions equation:

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

Where:

- k = 0.053 for $PM_{2.5}$, 0.35 for PM_{10}
- M = 3% 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. The lower level of moisture combined with an additional 90% emissions control was applied to calculated emissions from the conveyor transfers to account for additional emissions control measures required by Idaho regulations and the permit.

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 $PM_{2.5}$ factor – use 10 mph wind: $0.053\ (0.0032)\frac{(10/5)^{1.3}}{(3/2)^{1.4}} = 2.367\text{ E-4}$ lb/ton

Adjustment factors to put in the model:

Cat 1: $(1.72/5)^{1.3}$ (9.614 E-5) = 2.401 E-5 lb/ton
Factor = 2.401 E-5/2.367 E-4 = 0.1014

Cat 2: $(5.18/5)^{1.3}$ (9.614 E-5) = 1.007 E-4 lb/ton
Factor = 1.007 E-4 /2.367 E-4 = 0.4253

Cat 3: $(9.20/5)^{1.3}$ (9.614 E-5) = 2.124 E-4 lb/ton
Factor = 2.124 E-4/2.367 E-4 = 0.8974

Cat 4: $(14.95/5)^{1.3}$ (9.614 E-5) = 3.993 E-4 lb/ton
Factor = 3.993 E-4/2.367 E-4 = 1.687

Cat 5: $(21.28/5)^{1.3}$ (9.614 E-5) = 6.318 E-4 lb/ton
Factor = 6.318 E-4/2.367 E-4 = 2.669

Cat 6: $(27.74/5)^{1.3}$ (9.614 E-5) = 8.918 E-4 lb/ton
Factor = 8.918 E-4/2.367 E-4 = 3.768

For the operational scenario for 1,800 ton/day HMA and 175,000 ton/year HMA, emissions from the loader are as follows (daily and annual throughputs were based on aggregate being 96% of the total HMA production):

Daily $PM_{2.5}$:

2.367 E-4 lb $PM_{2.5}$	1,728 ton	day	2 transfers	=	0.03408 lb
ton	day	24 hr			hr

Annual $PM_{2.5}$:

2.367 E-4 lb $PM_{2.5}$	168,000 ton	yr	2 transfers	=	0.009079 lb
ton	yr	8,760 hour			hr

Emissions from the three conveyor transfers are as follows (with an additional 90% control):

Daily $PM_{2.5}$:

2.367 E-4 lb $PM_{2.5}$	1,728 ton	day	3 transfers	(1-0.90)	=	0.005113 lb
ton	day	24 hr				hr

Annual $PM_{2.5}$:

2.367 E-4 lb $PM_{2.5}$	168,000 ton	yr	3 transfers	(1-0.90)	=	0.001362 lb
ton	yr	8,760 hour				hr

Total aggregate handling emissions:

Daily $PM_{2.5}$: 0.03408 lb/hr + 0.005113 lb/hr = 0.03919 lb/hr
Annual $PM_{2.5}$: 0.009079 lb/hr + 0.001362 lb/hr = 0.01044 lb/hr

Screening Emissions

This HMA plant uses one scalping screen. A $PM_{2.5}$ factor for uncontrolled emissions was not available in AP42. A $PM_{2.5}$ factor was estimated by DEQ permit writers and entered into the HMA calculation spreadsheet. The uncontrolled emissions factor was used and a 90% reduction applied to calculated emissions to account for additional emissions control measures required by Idaho regulations and the permit.

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

For the operational scenario for 1,800 ton/day HMA and 175,000 ton/year HMA, emissions are as follows:

Scalping Screen (controlled emissions):

Daily $PM_{2.5}$:

0.000130 lb PM_{10}	1,728 ton	day	(1-0.90)	=	0.0009360 lb
ton	day	24 hour			hr

Annual $PM_{2.5}$:

0.000130 lb PM_{10}	168,000 ton	yr	(1-0.90)	=	0.0002493 lb
ton	yr	8,760 hour			hr

HMA Plant Modeling Parameters

Dryer baghouse Stack

Release height = 6.1 meters; effective diameter of release area = 1.04 meters;
typical stack gas temperature = 408 K; typical flow velocity = 17.6 meters/second

Asphalt Silo Filling

DEQ modeled this source as a point source.
- release height of 9 meters
- stack diameter of 3 meters, corresponding to the approximate diameter of the silo.
- gas temperature was estimated at half the AP42 default asphalt temperature: 325^o F / 2 = 163^o F (346 K)
- stack velocity of 0.1 m/sec to account for convective air flow.

Asphalt Loadout

DEQ modeled this source as a point source.
- release height of 3.5 meters
- stack diameter of 3 meters, corresponding to the approximate diameter of the silo.
- gas temperature was estimated at half the AP42 default asphalt temperature: 325^o F / 2 = 163^o F (346 K)
- stack velocity of 0.1 m/sec to account for convective air flow.

Aggregate to and from Storage and Conveyor Transfers

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

Initial dispersion coefficients:

σ_{y0} = 20 m / 4.3 = 4.65 m

σ_{z0} = 5 m / 4.3 = 1.16 m

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

Scalping Screen

This source was modeled as a single volume source on or adjacent to a structure 5 m X 4 m, 5.0 meters thick, with a release height of 3.0 meters. The initial dispersion coefficients are calculated as follows:

σ_{yo} = 4 m / 4.3 = 0.93 m
σ_{zo} = 5 m / 2.15 = 2.33 m

Asphalt Oil Heater

Parameters were provided by Dixie River. Release height = 2.4 meters; effective diameter of release area = 0.091 meters; typical stack gas temperature = 436 K; typical flow velocity = 10.3 meters/second.

CBP Modeled Emissions Rates

Aggregate and Sand Handling Emissions

A DEQ-developed CBP spreadsheet was used to calculate emissions rates for various averaging periods.

Emissions from aggregate and sand handling were calculated for the following transfers: 1) groundlevel transfers including transfers to a storage pile and transfers to the CBP hopper; 2) transfers to elevated storage.

PM_{10} and $PM_{2.5}$ modeled emissions associated with the handling of aggregate materials were calculated using emissions factors from AP42 Section 13.2.4 *Aggregate Handling and Storage Piles*, then adjusting for the composition of concrete to generate a lb/yd^3 of concrete factor. $PM_{2.5}$ emissions used in this impact modeling analysis for these handling activities differed from DEQ's CBP emission calculation spreadsheet somewhat. DEQ's spreadsheet generated a $PM_{2.5}$ factor by multiplying the lb/yd^3 factor for total PM in AP-42, Section 11.12 *Concrete Batching*, by a $PM_{2.5}$ fraction obtained from AP-42, Appendix B.2 *Generalized Particle Size Distributions, Table B-2.2, Category 3*, using a $PM_{2.5}$ fraction of 0.15 (for aggregate handling $PM_{2.5}$ = (PM)(0.15) = (0.0064 lb/yd^3)(0.15) = 0.00096 lb/yd^3). This resulted in a different $PM_{2.5}/PM_{10}$ ratio than using particle size factors (k) from AP42, Section 13.2.4, which was used for similar material handling sources for the HMA spreadsheet (and the basis of both emission factors was listed AP42 Section 13.2.4). The $PM_{2.5}$ calculation for uncontrolled aggregate handling is shown below, and the generated $PM_{2.5}$ emission factors were 0.0004621 lb/yd^3 for aggregate and 0.0001493 lb/yd^3 for sand.

Emissions were calculated using the following emissions equation:

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

Where:

k = 0.35 for PM_{10} and 0.053 for $PM_{2.5}$
M = moisture content % by weight of material: 1.77% for aggregate and 4.17% for sand
U = wind speed (mph)

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

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

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

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

Base $PM_{2.5}$ factor for aggregate – use 10 mph wind:

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

The base PM_{10} emission factor of 3.272 E-3 lb/ton was calculated based on the same calculations as $PM_{2.5}$, except using the PM_{10} particle size multiplier of 0.35.

Adjustment factors (based on $PM_{2.5}$ emissions) to put in the model:

Cat 1: $(1.72/5)^{1.3}$ (2.012 E-4) = 5.026 E-5 lb/ton
Factor = 5.026 E-5 / 4.955 E-4 = 0.1014

Cat 2: $(5.18/5)^{1.3}$ (2.012 E-4) = 2.107 E-4 lb/ton
Factor = 2.107 E-4 / 4.955 E-4 = 0.4253

Cat 3: $(9.20/5)^{1.3}$ (2.012 E-4) = 4.446 E-4 lb/ton
Factor = 4.446 E-4 / 4.955 E-4 = 0.8974

Cat 4: $(14.95/5)^{1.3}$ (2.012 E-4) = 8.358 E-4 lb/ton
Factor = 8.358 E-4 / 4.955 E-4 = 1.687

Cat 5: $(21.28/5)^{1.3}$ (2.012 E-4) = 1.323 E-3 lb/ton
Factor = 1.323 E-3 / 4.955 E-4 = 2.669

Cat 6: $(27.74/5)^{1.3}$ (2.012 E-4) = 1.867 E-3 lb/ton
Factor = 1.867 E-3 / 4.955 E-4 = 3.768

1 yd^3 of concrete ≈ 4024 lbs, consisting of:

- 1865 lbs aggregate
- 1428 lbs sand
- 491 lbs cement
- 73 lbs supplement
- 20 gal of water

Fraction of aggregate = 1865 lb / 4024 lb = 0.4635

Base $PM_{2.5}$ factor for aggregate in terms of lb/yd^3

$$\frac{4.955\text{ E-4 lb } PM_{2.5}}{\text{ton}} \left| \frac{0.4635\text{ ton agg}}{\text{ton concrete}} \right| \frac{\text{ton}}{2{,}000\text{ lb}} \left| \frac{4{,}024\text{ lb conc.}}{yd^3} \right. = \frac{4.621\text{ E-4 lb } PM_{2.5}}{yd^3}$$

The PM_{10} factor for aggregate is 3.051 E-3 lb PM_{10}/yd^3.
Assume moderate fugitive dust controls reduce emissions by an additional 75%.

Base controlled PM_{10} factor in terms of lb/yd^3

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

Controlled PM_{10} factors for aggregate handling are 7.628 E-4 lb PM_{10}/yd^3.

Using the same process for sand handling (using a moisture content of 4.17% for sand in the emission equation), the uncontrolled emission factors are 1.493 E-4 lb $PM_{2.5}/yd^3$ and 7.039 E-4 lb PM_{10}/yd^3.

Controlled factors for sand handling are 3.733 E-5 lb $PM_{2.5}/yd^3$ and 1.760 E-4 lb PM_{10}/yd^3.

There are two groundlevel transfers of aggregate and sand: 1) transfer to a storage pile; 2) transfer from a pile to the hopper.

For the operational scenario for 1,440 cy/day concrete and 375,000 cy/year concrete, $PM_{2.5}$ emissions from aggregate and sand transfers at groundlevel are as follows:

Daily $PM_{2.5}$:

$$\frac{1.155\text{ E-4 lb} + 3.733\text{ E-5 lb}}{yd^3\text{ - transfer}} \left| 2\text{ transfers} \right| \frac{1{,}440\ yd^3}{\text{day}} \left| \frac{\text{day}}{24\text{ hr}} \right. = \frac{0.01834\text{ lb } PM_{2.5}}{\text{hr}}$$

Annual $PM_{2.5}$:

$$\frac{1.155\text{ E-4 lb} + 3.733\text{ E-5 lb}}{yd^3\text{ - transfer}} \left| 2\text{ transfers} \right| \frac{375{,}000\ yd^3}{\text{yr}} \left| \frac{\text{yr}}{8760\text{ hr}} \right. = \frac{0.01308\text{ lb } PM_{2.5}}{\text{hr}}$$

These sources were modeled as a single volume source in a 10-meter by 10-meter area with a 3-meter depth. The release height was set at 2.0 m. The initial dispersion coefficients were calculated using AERMOD guidance for volume sources as follows:

σ_{yo} = 10.0 m / 4.3 = 2.33 m
σ_{zo} = 3.0 m / 4.3 = 0.70 m

There is one elevated transfer of aggregate and sand: 1) transfer to elevated storage bin.
For the operational scenario for 1,440 cy/day concrete and 375,000 cy/year concrete, emissions from aggregate and sand transfers to elevated storage are as follows:

Daily $PM_{2.5}$:

1.155 E-4 lb + 3.733 E-5 lb	1 transfers	1,440 yd^3	day	=	0.009170 lb $PM_{2.5}$
yd^3 - transfer		day	24 hr		hr

Annual $PM_{2.5}$:

1.155 E-4 lb + 3.733 E-5 lb	1 transfers	375,000 yd^3	year	=	0.006542 lb $PM_{2.5}$
yd^3 - transfer		yr	8760 hr		hr

These sources were modeled as a single volume source on or adjacent to a 10-meter square building, 10.0 meters high, with a release height of 5.0 meters. The initial dispersion coefficients were calculated as follows:

σ_{yo} = 10 m / 4.3 = 2.33 m
σ_{zo} = 10.0 m / 2.15 = 4.65 m

Cement and Supplement Silo Filling Emissions

A DEQ-developed CBP spreadsheet was used to calculate emissions rates for various averaging periods. Emissions are controlled by a baghouse.

Stack parameters for the cement and supplement silo of the CBP were provided in the submitted application. DEQ conservatively modeled the release at 0.0 Kelvin to eliminate buoyancy flux. Other stack parameters of stack diameter and flow appeared to be reasonably conservative.

Weigh Hopper Loading Baghouse Emissions

A DEQ-developed CBP spreadsheet was used to calculate emissions rates for various averaging periods. Emissions are controlled by a baghouse.

Stack parameters for the weigh hopper loading baghouse of the CBP were provided in the submitted application but appeared to be of suspect accuracy. DEQ conservatively modeled the release with a 1.0 m diameter, a 1.0 m/sec velocity, and 0.0 Kelvin to eliminate buoyancy flux and minimize momentum flux. Since emission rates at this source are minimal compared to the truck loadout source, high accuracy of these parameters are not critical to modeled impacts.

Truck Loadout Emissions

A DEQ-developed CBP spreadsheet was used to calculate emissions rates for various averaging periods. Emissions from mixer truck loading are controlled by a shroud and water spray by 80 percent.

Emissions from truck loadout of dry concrete, fly ash, and aggregate were modeled as a volume source. The release height was set at 3.75 meters, the typical height of cement truck feed chutes. The initial horizontal dimension (σ_{yo}) was set at a value equal to the length of the source's side divided by 4.3, as directed by EPA guidance for AERMOD[3]. The length of side was set to 10 meters to represent the structure of the plant and any adjacent building, and σ_{yo} was calculated at 2.33 meters. The initial vertical dimension (σ_{zo}) was set at a value equal to the vertical extent of the source or the height of an adjacent building divided by 2.15, as directed by EPA guidance for AERMOD. The vertical extent was set at two times the release height or 7.5 meters, giving a σ_{zo} of 3.49 meters.

σ_{yo} = 10 m / 4.3 = 2.33 m
σ_{zo} = 7.5 m / 2.15 = 3.49 m

Rock Crushing Plant Modeled Emissions Rates

Compliance determination is linked to throughput levels and the equipment configuration at the site.

Emissions from Crushing, Screening, and Material Handling

Emissions from the rock crushing plant were calculated using methods as described in: *Guidance on Emission Factors for the Mining Industry*, Nevada Division of Environmental Protection (NDEP), Bureau of Air Pollution Control (BAPC), Permitting Branch, May 31, 2017. Rock crushing emission factors listed in the NDEP guidance were based on those presented in EPA's *AP-42: Fifth Edition Compilation of Air Pollutant Emissions Factors, Volume 1: Stationary Point and Area Sources* (AP-42), Chapter 11.19.2 Crushed Stone Processing and Pulverized Mineral Processing.

AP-42 PM_{10} and $PM_{2.5}$ factors were not available for primary and secondary crushing, so PM_{10} emission factors for tertiary crushing were conservatively used. $PM_{2.5}$ factors were not available for sources listed in AP-42 Chapter 11.19.2, so $PM_{2.5}$ factors were based on the applicable PM_{10} factor multiplied by the $PM_{2.5}/PM_{10}$ fraction obtained from AP-42 Chapter 13.2.4 Aggregate Handling and Storage Piles ($PM_{2.5} = PM_{10}[0.053/0.35]$).

Rock Crushing Plant Sources and Emission Factors			
Emission Source	**Emission Factor (lb/ton)**		**Number of Sources**
	PM_{10}	**$PM_{2.5}$**	
Crushing	0.0024[a]	0.0004[b]	2
Screening and Associated Transfers	0.0087[c]	0.0013[b]	3
Conveyor Transfers	0.0011[c]	0.00017[b]	4

a. AP-42, Chapter 11.19.2 factor for tertiary crushing
b. Factor based on PM_{10} factor multiplied by a $PM_{2.5}/PM_{10}$ ratio obtained from the ratio of particle size multipliers in AP-42 Chapter 13.2.4.
c. AP-42, Chapter 11.29.2 factor.

Throughput for the rock crushing plant was based on a claimed throughput of the plant at 25,000 ton/month. Annual throughput of 300,000 ton/year was based on 12 months of operation. Maximum daily throughput of 1,670 ton/day (about 70 ton/hour for continuous operation) was based on twice the average rate for 30 day/month operation. Total emissions from the rock crushing plant assumed operation of two crushers, three screens, and four conveyor transfers. Total emissions from the rock crushing plant were modeled from two volume sources.

Rock Crushing Plant Emissions			
Emission Source	**Emissions (lb/hour)**		
	24-hour PM_{10}[a]	**24-hour $PM_{2.5}$[a]**	**Annual $PM_{2.5}$[b]**
Crushing (2 sources)	0.336	0.0560	0.0274
Screening and Associated Transfers (3 sources)	1.827	0.273	0.1334
Conveyor Transfers (4 sources)	0.308	0.0476	0.0233
TOTAL Emissions	2.471	0.374	0.184
Emissions per Modeled Source (2 Sources)	1.236	0.187	0.092

a. Emissions based on 70 ton/hour throughput for 24 hours.
b. Emissions based on 34.2 ton/hour throughput for 8,760 hours (300,000 ton/year).

Emissions from the rock crushing plant were modeled as two side-by-side volume sources. Each volume source was 50 meters square and 6 meters thick, with a release height of 3 meters. Release parameters were calculated as described in AERMOD guidance for volume sources not on or adjacent to buildings.

σ_{yo} = 50 m / 4.3 = 11.6 m
σ_{zo} = 6.0 m / 4.3 = 1.40 m

APPENDIX C – FACILITY DRAFT COMMENTS

The facility had no comments.

APPENDIX D – PROCESSING FEE

PTC Processing Fee Calculation Worksheet

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:	**Dixie River dba River Rock Sand & Gravel 00586**
Address:	**Portable throughout Idaho**
City:	
State:	**ID**
Zip Code:	
Facility Contact:	**Lance Thueson**
Title:	**Responsible Official**
AIRS No.:	**777-00586**

Y	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	9.0	0	9.0
SO_2	8.0	0	8.0
CO	23.0	0	23.0
PM10	2.3	0	2.3
VOC	4.1	0	4.1
TAPS/HAPS	1.0	0	1.0
Total:	47.4	0	**47.4**
Fee Due	**$ 500.00**		

Comments: HMA GP