Statement of Basis

Permit to Construct Operating Permit No. P-2010.0154
Project No. 60625

Aggregate Industries SWR
Portable Asphalt Plant
Various Locations in Idaho

Facility ID No. 777-00498

Final

February 28, 2011 D.P.
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Permit Writer

The purpose of this Statement of Basis is to satisfy the requirements of IDAPA 58.01.01.et seq, Rules for the Control of Air Pollution in Idaho, for issuing air permits.

ACRONYMS, UNITS, AND CHEMICAL NOMENCLATURE

AAC	acceptable ambient concentrations
AACC	acceptable ambient concentrations for carcinogens
acfm	actual cubic feet per minute
AFS	AIRS Facility Subsystem
AIRS	Aerometric Information Retrieval System
AQCR	Air Quality Control Region
ASTM	American Society for Testing and Materials
BACT	Best Available Control Technology
BMP	best management practices
Btu	British thermal units
CAA	Clean Air Act
CAM	Compliance Assurance Monitoring
CAS No.	Chemical Abstracts Service registry number
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
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
gpm	gallons per minute
gph	gallons per hour
gr	grain (1 lb = 7,000 grains)
HAP	hazardous air pollutants
hp	horsepower
hr/yr	hours per year
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
mg/dscm	milligrams per dry standard cubic meter
MMBtu	million British thermal units
MMscf	million standard cubic feet
NAAQS	National Ambient Air Quality Standard
NAICS	North American Industry Classification System
NESHAP	National Emission Standards for Hazardous Air Pollutants
NO_2	nitrogen dioxide
NO_X	nitrogen oxides
NSPS	New Source Performance Standards
O&M	operation and maintenance
PAH	polyaromatic hydrocarbons

PC	permit condition
PCB	polychlorinated biphenyl
PERF	Portable Equipment Relocation Form
PM	particulate matter
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
PTC/T2	permit to construct and Tier II operating permit
PTE	potential to emit
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
SIC	Standard Industrial Classification
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/yr	tons per consecutive 12-calendar month period
T2	Tier II operating permit
TAP	toxic air pollutants
TEQ	toxicity equivalent
T-RACT	Toxic Air Pollutant Reasonably Available Control Technology
U.S.C.	United States Code
UTM	Universal Transverse Mercator
VOC	volatile organic compounds
yd^3	cubic yards
$\mu g/m^3$	micrograms per cubic meter

FACILITY INFORMATION

Description

Aggregate Industries SWR has proposed a new portable drum-mix asphalt plant. The asphalt plant consists of a counter-flow drum mixer with a reverse pulse-jet bag house, an asphaltic oil storage tank with a heater, two compression ignition IC engines powering electrical generators, 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. Aggregate is then dispensed from the feed bins onto feeder conveyors, which transfer the aggregate to the asphalt drum mixer. Next, aggregate travels through the rotating drum mixer, and when dried and heated, it is mixed with 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. As part of the operation, the Applicant has proposed that a portable rock crusher be allowed to be collocated at the facility.

Permitting History

This is the initial PTC for an existing out-of-state facility thus there is no permitting history.

Application Scope

This permit is the initial PTC for this facility. Aggregate Industries SWR has proposed the installation of a portable asphalt plant. The proposed portable source will include a Gencor 400 counter-flow drum dryer vented to a reverse pulse-jet baghouse. The asphalt plant will combust fuel oil or reprocessed fuel oil. The asphalt plant will be fed a mixture of crushed fines and aggregates from either a collocated crusher or imported aggregate. The rock crusher will be permitted independently from the asphalt plant. In the case of collocation of an asphalt plant, a concrete batch plant, or an additional rock crushing plant, the modeling completed by DEQ requires a minimum separation distance of 1,000 ft.

The process begins with materials being fed via front end loader to a four 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 counter-flow drum mixer via a two belts post 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 aggregates.

The mixed hot mix 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 slat 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 drum mixer will be collected and vented to a high efficiency baghouse with a control efficiency of 99.0%.

The asphalt plant will include a hot oil heating system designed to keep asphaltic oil at specification temperature. Heat will be provided via a 2.0 MMBtu/hr fuel oil-fired 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.

The Applicant has also proposed asphalt production rate throughput limits of 425 tons per hour, 3,800 tons per day, and 150,000 tons per year. The Applicant has also proposed typical operation of 12 hours per day.

The Applicant has also proposed that two compression ignition IC engines powering electrical generators, a primary and a backup, will be used to provide electricity for the facility when line power is not available.

Application Chronology

November 9, 2010	DEQ received an application and an application fee.
December 2 – December 17, 2010	DEQ provided an opportunity to request a public comment period on the application and proposed permitting action.
December 9, 2010	DEQ determined that the application was complete.
February 7, 2011	DEQ made available the draft permit and statement of basis for peer and regional office review.
February 7, 2011	DEQ made available the draft permit and statement of basis for applicant review.
Month Day – Month Day, Year	DEQ provided a public comment period on the proposed action.
Month Day, Year	DEQ received the permit processing fee.
Month Day, Year	DEQ issued the final permit and statement of basis.

TECHNICAL ANALYSIS

Emissions Units and Control Devices

Table 1 EMISSIONS UNIT AND CONTROL DEVICE INFORMATION

ID No.	Source Description	Control Equipment Description	Emissions Point ID No. and Description
Hot Mix Asphalt Drum Mixer	Hot Mix Asphalt Drum Mixer: Manufacturer: Gencor HP 2700 Model: 400TPH Type: Counter-flow Manufacture Date: 2001 Max. production: 425 T/hr, 3,800 T/hr, and 150,000 T/yr Fuel(s): #2 fuel oil or used oil Fuel consumption: 650 gal/hr	Drum Mixer Baghouse: Manufacturer: Gencor Model: C910377942 Type: Reverse pulse-jet Flow rate: 34,667 dscf PM_{10} control efficiency: 99.0%	Exit height: 30 ft (9.14 m) Exit dimensions: 58 in x 43 in (1.47 m x 1.09 m) Exit flow rate: 54,000 acfm Exit temperature: 250 °F (121.1 °C)
Asphaltic Oil Tank Heater	Asphaltic Oil Tank Heater: Heat input rating: 2.0 MMBtu/hr Fuel(s): Natural gas, #2 fuel oil, and used oil Fuel consumption: 14.6 gal/hr	N/A	Exit height: 12 ft (3.66 m) Exit diameter: 0.67 ft (0.20 m) Exit flow rate: 1,500 acfm Exit temperature: 300 °F (148.9 °C)
Primary IC Engine	Primary IC Engine: Manufacturer: Caterpillar Model: D399 Manufacture Date: 1980 Max. power rating: 1,000 bhp Fuel: Diesel Fuel consumption: 52 gal/hr Annual use limit: 1,000 hrs/yr	N/A	Exit height: 14 ft (4.27 m) Exit diameter: 0.67 ft (0.20 m) Exit flow rate: 8,500 acfm Exit temperature: 850 °F (454.4 °C)
Backup IC Engine	Backup IC Engine: Manufacturer: Caterpillar Model: 6260 Manufacture Date: 1995 Max. power rating: 86 bhp Fuel: Diesel Fuel consumption: 5 gal/hr Annual use limit: 2,000 hrs/yr	N/A	Exit height: 6 ft (1.83 m) Exit diameter: 0.50 ft (0.15 m) Exit flow rate: 3,500 acfm Exit temperature: 850 °F (454.4 °C)
Materials Handling	Material Transfer Points: Materials handling Asphalt aggregate transfers Truck unloading of aggregate Aggregate conveyor transfers Aggregate handling	Water sprays (or equivalent)	N/A

Emissions Inventories

An emission inventory was developed for the asphalt production operation using the DEQ developed HMA EI spreadsheet (see Appendix A). Emissions estimates of criteria pollutant PTE were based on the following assumptions:

- Maximum asphalt production does not exceed 425 ton/hour, 3,800 ton/day, and 150,000 ton/year (per the Applicant).
- Emissions from the asphalt drum dryer were based on the maximum emissions from using either diesel or used oil to fuel the dryer.
- The primary diesel engine powering a generator has a combined power rating of less than less than or equal to 1,000 bhp; operation up to 12 hour/day, 1,000 hour/year.
- The backup diesel engine powering a generator has a combined power rating of less than less than or equal to 86 bhp; operation up to 12 hour/day, 2,000 hour/year.

Summaries of the estimated uncontrolled and controlled emissions of criteria pollutants, TAPs, and HAPs from the facility are provided in the following tables.

Uncontrolled Emissions:

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

- For the asphalt drum mixer controlled and uncontrolled emissions were assumed to be equal.
- For the asphaltic oil tank heater controlled emissions were scaled up from 2,000 hours per year of permitted operation 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 1,000 hours per year of permitted operation to 8,760 hours per year for full-time operation.
- For the backup IC engine controlled emissions were scaled up from 2,000 hours per year of permitted operation to 8,760 hours per year for full-time operation.

See Appendix A for a detailed presentation of the calculations of these emissions for each emissions unit.

Table 2 POST PROJECT UNCONTROLLED EMISSIONS FOR CRITERIA POLLUTANTS

Emissions Unit	PM_{10}	SO_2	NO_X	CO	VOC	Lead
	T/yr	T/yr	T/yr	T/yr	T/yr	lb/quarter
Point Sources						
Asphalt Drum Mixer	1.73	4.35	4.13	9.75	2.40	0.00
Asphaltic Oil Tank Heater	0.22	0.00	1.27	0.31	0.04	0.00
Materials Handling	0.00	0.00	0.00	0.00	0.00	0.00
Primary IC Engine	3.07	0.09	105.12	24.09	3.07	0.00
Backup IC Engine	0.83	0.79	11.69	2.50	0.92	0.00
Total, Point Sources	**5.85**	**5.23**	**122.21**	**36.65**	**6.43**	**0.00**

Pre-Project Potential to Emit

This is a new proposed facility. Therefore, pre-project emissions are set to zero for all criteria pollutants.

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 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 3 POST PROJECT POTENTIAL TO EMIT FOR CRITERIA POLLUTANTS

Emissions Unit	PM_{10}		SO_2		NO_X		CO		VOC		Lead	
	lb/hr[a]	T/yr[b]	lb/hr[a]	T/yr[b]	lb/hr[a]	T/yr[b]	lb/hr[a]	T/yr[b]	lb/hr[a]	T/yr[b]	lb/hr	T/yr
Point Sources												
Asphalt Drum Mixer	9.78	1.73	24.65	4.35	23.38	4.13	55.25	9.75	13.60	2.40	6.38E-03	1.13E-03
Asphaltic Oil Tank Heater	0.05	0.05	0.00	0.00	0.29	0.29	0.07	0.07	0.01	0.01	2.20E-05	2.20E-05
Materials Handling	2.09	0.37	0.00	0.00	0.00	0.00	1.07	0.19	1.71	0.30	0.0	0.0
Primary IC Engine	0.70	0.35	0.012	0.01	24.00	12.00	5.50	2.75	0.70	0.35	0.0	0.0
Backup IC Engine	0.19	0.19	0.18	0.18	2.67	2.67	0.57	0.57	0.21	0.21	0.0	0.0
Post Project Totals	**12.81**	**2.69**	**24.84**	**4.54**	**50.34**	**19.09**	**62.46**	**13.33**	**16.23**	**3.27**	**0.0064**	**0.0012**

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 3, this facility has uncontrolled potential to emit for NO_X emissions greater 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. Therefore, this facility is designated as a Synthetic Minor facility. As demonstrated in Table 3 the facility's PTE for all criteria pollutants is less than 80% of the Major Source thresholds of 100 T/yr. Therefore, this facility will not be designated as a SM-80 facility.

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 or if emissions modeling 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 4 CHANGES IN POTENTIAL TO EMIT FOR CRITERIA POLLUTANTS

	PM_{10}		SO_2		NO_X		CO		VOC		Lead	
	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr
Point Sources												
Pre-Project Potential to Emit	0.0	0.0	0.0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Post Project Potential to Emit	12.81	2.69	24.84	4.54	50.34	19.09	62.46	13.33	16.23	3.27	0.0	0.0
Changes in Potential to Emit	**12.81**	**2.69**	**24.84**	**4.54**	**50.34**	**19.09**	**62.46**	**13.33**	**16.23**	**3.27**	**0.00**	**0.00**

Non-Carcinogenic TAP Emissions

A summary of the estimated uncontrolled and controlled non-carcinogenic emissions increase of toxic air pollutants (TAP) is provided in the following table.

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

Table 5 PRE- AND POST PROJECT NON-CARCINOGENIC TAP EMISSIONS SUMMARY POTENTIAL TO EMIT

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	0.0	1.33E-01	0.1330	119	No
Acrolein	0.0	4.16E-03	0.0042	0.017	No
Antimony	0.0	7.96E-05	0.0001	0.033	No
Barium	0.0	9.43E-04	0.0009	2	No
Carbon disulfide	0.0	3.94E-04	0.0001	0.033	No
Chromium metal (II and III)	0.0	8.79E-05	0.0001	0.033	No
Cobalt metal dust, and fume	0.0	6.27E-05	0.0001	0.0033	No
Copper (fume)	0.0	5.08E-04	0.0005	0.013	No
Crotonaldehyde	0.0	1.36E-02	0.0136	0.38	No
Cumene	0.0	7.24E-04	0.0007	16.3	No
Ethyl benzene	0.0	4.06E-02	0.0406	29	No
Ethyl chloride (Chloroethane)	0.0	7.86E-05	0.0001	176	No
Heptane	0.0	1.49E-00	1.4900	109	No
Hexane	0.0	1.49E-01	0.1490	12	No
Manganese as Mn (fume)	0.0	1.25E-03	0.0013	0.067	No
Mercury (alkyl compounds as Hg)	0.0	4.13E-04	0.0004	0.001	No
Methyl bromide	0.0	1.58E-04	0.0002	1.27	No
Methyl chloride (Chloromethane)	0.0	5.43E-04	0.0005	6.867	No
Methyl chloroform	0.0	7.60E-03	0.0076	127	No
Methyl ethyl ketone (MEK)	0.0	4.24E-03	0.0042	39.3	No
Molybdenum (soluble)	0.0	7.66E-06	0.0000	0.333	No
Pentane	0.0	0.00E-00	0.0000	118	No
Phenol	0.0	6.37E-04	0.0006	1.27	No
Phosphorous	0.0	4.53E-03	0.0045	0.007	No
Propionaldehyde	0.0	2.06E-02	0.0206	0.0287	No
Quinone	0.0	2.53E-02	0.0253	0.027	No
Selenium	0.0	6.21E-05	0.0001	0.013	No
Silver as Ag (soluble)	0.0	7.60E-05	0.0001	0.001	No
Styrene monomer	0.0	1.52E-04	0.0002	6.67	No
Thallium	0.0	6.49E-07	0.0000	0.007	No
Toluene	0.0	4.63E-01	0.4630	25	No
Trichloroethylene	0.0	0.00E-00	0.0000	17.93	No
Vanadium as V_2O_5, (respirable dust and fume)	0.0	3.09E-04	0.0003	0.003	No
Xylene	0.0	4.57E-02	0.0457	29	No
Zinc metal	0.0	9.94E-03	0.0099	0.667	No

The estimated controlled emissions increases of TAP were all below applicable emissions screening levels (ELs).Therefore, modeling is not required for any 585 TAPs because the 24-hour average non-carcinogenic screening EL identified in IDAPA 58.01.01.585 were not exceeded.

Carcinogenic TAP Emissions

A summary of the estimated uncontrolled and controlled carcinogenic emissions increase of toxic air pollutants (TAP) is provided in the following table.

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

Table 6 PRE- AND POST PROJECT CARCINOGENIC TAP EMISSIONS SUMMARY POTENTIAL TO EMIT

Carcinogenic Toxic Air Pollutants	Pre-Project Annual Average Emissions Rates for Units at the Facility (lb/hr)	Post Project Annual Average Emissions Rates for Units at the Facility (lb/hr)	Change in Annual Average Emissions Rates for Units at the Facility (lb/hr)	Carcinogenic Screening Emission Level (lb/hr)	Exceeds Screening Level? (Y/N)
Acetaldehyde	0.0	2.24E-02	**0.0224**	3.0E-03	Yes
Arsenic	0.0	1.40E-05	**0.000014**	1.5E-06	Yes
Benzene	0.0	7.60E-03	**0.0076**	8.0E-04	Yes
Beryllium and compounds	0.0	9.26E-08	**0.0000001**	2.8E-05	No
Cadmium and compounds	0.0	8.35E-06	**0.0000085**	3.7E-06	Yes
Chromium (VI)	0.0	8.53E-06	**0.000009**	5.6E-07	Yes
Dichloromethane	0.0	5.21E-06	**0.000005**	1.6E-03	No
Formaldehyde	0.0	5.48E-02	**0.0548**	5.1E-04	Yes
Nickel	0.0	1.36E-03	**0.0014**	2.7E-05	Yes
PAHs Total	0.0	1.63E-02	**0.0163**	9.1E-05	Yes
POM Total	0.0	3.36E-05	**0.000034**	2.0E-06	Yes
Tetrachloroethylene	0.0	5.07E-05	**0.0001**	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.

Some of the estimated controlled emissions increases of TAP exceeded applicable emissions screening levels (EL). Therefore, modeling is required for Acetaldehyde, Arsenic, Benzene, Cadmium, Chromium IV, Formaldehyde, Nickel, PAHs, and POM because the annual average carcinogenic screening ELs identified in IDAPA 58.01.01.586 were exceeded.

Post Project HAP Emissions

The following table presents the post project potential to emit for HAP pollutants from all emissions units at the facility 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 7 HAP EMISSIONS SUMMARY POTENTIAL TO EMIT

IDAPA Listing	HAP Pollutants	PTE (T/yr)
585	Dioxins	1.82E-08
	Furans	2.72E-8
	Acrolein	2.04E-03
	Ethyl benzene	1.80E-02
	Hexane	6.90E-02
	Methyl chloroform	3.60E-03
	Methyl ethyl ketone (MEK)	1.50E-03
	Propionaldehyde	9.75E-03
	Quinone	1.20E-02
	Toluene	2.19E-01
	Xylene	1.59E-02
586	Acetaldehyde	9.81E-02
	Benzene	3.28E-02
	1,3-Butadiene	2.46E-05
	Formaldehyde	2.34E-01
Not listed	Isooctane	3.00E-03
	Total	**0.72**

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 PM_{10}, SO_2, NO_X, CO, VOC, HAP, and TAPs 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[1]. Refer to the Emissions Inventories section for additional information concerning the emission inventories.

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

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

T-RACT Analysis

DEQ is satisfied that an asphalt plant adhering to the conditions of this permit will not exceed any applicable acceptable ambient concentration (AAC) or AAC for carcinogens (AACC) for TAPs, except those TAPs using T-RACT analysis to demonstrate pre-construction compliance. As described in the Emissions Inventories Section previously, most of the uncontrolled TAP emission rate estimates were found to be less than their corresponding emission screening level (EL) listed in Section 585-586 of IDAPA 58.01.01. For those TAPs, the requirements under Section 210.05 are met and no further procedures for demonstrating preconstruction compliance are required.

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

For the TAPs that exceed the EL in Section 585-586 of IDAPA 58.01.01, preconstruction compliance was demonstrated under the rules for toxic air pollutant reasonably available control technology (T-RACT) as specified in Sections 210.12-14 of IDAPA 58.01.01.

In accordance with IDAPA 58.01.01.210.12, the proposed T-RACT ambient concentrations at the point of compliance for each applicable TAP are less than, or equal to, the T-RACT ambient concentration (i.e., less than 10 times the applicable AACC listed in IDAPA 58.01.01.586).

In accordance with IDAPA 58.01.01.210.14, this T-RACT analysis included consideration of available control technologies and/or "The application of a design, equipment, work practice or operational requirement, or combination thereof", for compliance with the T-RACT requirements. This included a search of EPA's RACT, BACT, LAER Clearinghouse to identify available control technologies. To meet the T-RACT requirements, the permit requires the control measures determined to meet T-RACT as summarized in the following table. These control measure were selected based upon consideration of the technological feasibility for this process/operation, the economic feasibility, energy requirements, and environmental impacts.

For control technologies, the TAPs from this operation are categorized as follows:

- Metals: Arsenic; Cadmium, Chromium VI, and Nickel
- Organics and acids: PAHs, POM, dioxins/furans, hydrochloric acid, quinone, and acetaldehyde

Table 8 T-RACT CONTROL MEASURES

TAP	Proposed T-RACT Control Measures	Permit Conditions
Organics	Good maintenance practices for the control equipment (the baghouse)	31
Metals	Fuel specifications Baghouse control of HMA drum mixer emissions Recycling of collected particulate back to the asphalt drum mixer	22 and 21
Formaldehyde	Use of a covered conveyor from the HMA drum mixer to the silo/loadout to minimize off-gassing emissions	4

In accordance with IDAPA 58.01.01.210.12.d and 58.01.01.210.14.e, emission limits and other permit conditions for each T-RACT pollutant have been incorporated into the permit as summarized in the table above to assure that the facility will be operated in the manner described in the preconstruction compliance demonstration. A detailed T-RACT analysis is provided in Appendix D.

REGULATORY ANALYSIS

Attainment Designation (40 CFR 81.313)

Because a separate modeling analysis was not provided to demonstrate compliance with applicable standards in nonattainment areas, this portable facility is not permitted for operation in nonattainment areas.

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 17 and 41.

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 3, 4, and 9.

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 425 T/hr, E is calculated as follows:

Proposed throughput = 425 T/hr x 2,000 lb/1 T = 850,000 lb/hr

Therefore, E is calculated as:

$E = 1.10 \times PW^{0.25} = 1.10 \times (850{,}000\ lb/hr)^{0.25} = 33.40$ lb-PM/hr

As presented previously in the Emissions Inventory Section of this evaluation the post project PTE for this emissions unit is 9.78 lb-PM_{10}/hr. Assuming PM is 50% PM_{10} means that PM emissions will be 19.56 lb-PM/hr (9.78 lb-PM_{10}/hr ÷ 0.5 lb-PM_{10}/lb-PM). Therefore, compliance with this requirement has been demonstrated.

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

IDAPA 58.01.01.301 Requirement to Obtain Tier I Operating Permit

IDAPA 58.01.01.006.118 defines a Tier I source as "Any source located at a major facility as defined in Section 008." IDAPA 58.01.01.008.10 defines a Major Facility as either:

- For HAPS a facility with the potential to emit ten (10) tons per year (tpy) or more of any hazardous air pollutant, other than radionuclides, or
- The facility emits or has the potential to emit twenty-five (25) tpy or more of any combination of any hazardous air pollutants, other than radionuclides.

or, for non-attainment areas (Note: The State of Idaho currently has no serious non-attainment areas therefore the Major Source threshold is defined as follows):

- The facility emits or has the potential to emit one hundred (100) tons per year or more of any regulated air pollutant. The fugitive emissions shall not be considered in determining whether the facility is major unless the facility is a "Designated Facility":

Therefore, it needs to be determined if this facility is a HAP Major Source. The following table compares this facility's post-project facility-wide annual PTE for all HAPs emitted by the source to the HAPS Major Source thresholds in order to determine if this facility is a HAPs Major Source.

Table 9 PTE FOR HAP POLLUTANTS COMPARED TO THE HAP MAJOR SOURCE THRESHOLDS

HAP Pollutants	PTE (T/yr)	Major Source Threshold (T/yr)	Exceeds the Major Source Threshold?
Dioxins	1.82E-08	10	No
Furans	2.72E-8	10	No
Acrolein	2.04E-03	10	No
Ethyl benzene	1.80E-02	10	No
Hexane	6.90E-02	10	No
Methyl chloroform	3.60E-03	10	No
Methyl ethyl ketone (MEK)	1.50E-03	10	No
Propionaldehyde	9.75E-03	10	No
Quinone	1.20E-02	10	No
Toluene	2.19E-01	10	No
Xylene	1.59E-02	10	No
Acetaldehyde	9.81E-02	10	No
Benzene	3.28E-02	10	No
1,3-Butadiene	2.46E-05	10	No
Formaldehyde	2.34E-01	10	No
Isooctane	3.00E-03	10	No
Total	**0.72**	**25**	**No**

As presented in the preceding table the PTE for each HAP is less than 10 T/yr and the PTE for all HAPs combined is less than 25 T/yr. Therefore, this facility is not a HAPs Major Source subject to Tier I requirements.

Therefore, it needs to be determined if this facility is a criteria pollutant Major Source. As discussed previously the Aggregate Industries SWR facility will be located in location throughout the state (except for nonattainment areas). This means the facility will be located in areas of the state which are designated as unclassifiable/ attainment for $PM_{2.5}$, PM_{10}, SO_2, NO_X, CO, and Ozone for federal and state criteria air pollutants. Therefore, the following table compares the post-project facility-wide annual PTE for all criteria pollutants emitted by the source to the applicable criteria pollutant Major Source thresholds in order to determine if the facility is a criteria pollutant Major Source.

Table 10 PTE FOR CRITERIA POLLUTANTS COMPARED TO THE CRITERIA POLLUTANT MAJOR SOURCE THRESHOLDS

Criteria Pollutants	PTE (T/yr)	Major Source Threshold (T/yr)	Exceeds the Major Source Threshold?
PM_{10}	2.69	100	No
SO_2	4.54	100	No
NO_X	19.09	100	No
CO	13.33	100	No
VOC	3.27	100	No

As presented in the preceding table the PTE for each criteria pollutant is less than 100 T/yr. Therefore, this facility is not a criteria pollutant Major Source subject to Tier I requirements.

PSD Classification (40 CFR 52.21)

40 CFR 52.21 Prevention of Significant Deterioration of Air Quality

The facility is not a major stationary source as defined in 40 CFR 52.21(b)(1), nor is it undergoing any physical change at a stationary source not otherwise qualifying under paragraph 40 CFR 52.21(b)(1) as a major stationary source, that would constitute a major stationary source by itself as defined in 40 CFR 52. Therefore in accordance with 40 CFR 52.21(a)(2), PSD requirements are not applicable to this permitting action. The facility is/is not a designated facility as defined in 40 CFR 52.21(b)(1)(i)(a), and does not have facility-wide emissions of any criteria pollutant that exceed 250 T/yr.

NSPS Applicability (40 CFR 60)

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 16 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 24 and 25 includes the requirements of this section.

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 Backup 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.

The Primary IC Engine was manufactured in 1980 and the Backup IC Engine was manufactured in 1995 and both have not been modified or reconstructed. Therefore, the requirements of this subpart are not applicable to the two diesel-fired IC engines proposed by the Applicant.

NESHAP Applicability (40 CFR 61)

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

MACT Applicability (40 CFR 63)

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 Backup IC Engine. The diesel-fired Primary IC Engine was constructed in 1980. The diesel-fired Backup IC Engine was constructed in 1995. Therefore, the requirements of this subpart may apply.

40 CFR 63, Subpart ZZZZ — **National Emission Standard for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines**

§ 63.6580 — What is the purpose of subpart ZZZZ?

Subpart ZZZZ establishes national emission limitations and operating limitations for hazardous air pollutants (HAP) emitted from stationary reciprocating internal combustion engines (RICE) located at major and area sources of HAP emissions. This subpart also establishes requirements to demonstrate initial and continuous compliance with the emission limitations and operating limitations. As demonstrated previously in the Emissions Inventories Section of this analysis this facility is an area source for HAPs as the potential to emit for HAPs is 0.72 T/yr. Therefore, the engines at this facility may be subject to the requirements of Subpart ZZZZ.

§ 63.6585 — What is the purpose of subpart ZZZZ?

You are subject to this subpart if you own or operate a stationary RICE at a major or area source of HAP emissions, except if the stationary RICE is being tested at a stationary RICE test cell/stand.

(a) A stationary RICE is any internal combustion engine which uses reciprocating motion to convert heat energy into mechanical work and which is not mobile. Stationary RICE differ from mobile RICE in that a stationary RICE is not a non-road engine as defined at 40 CFR 1068.30, and is not used to propel a motor vehicle or a vehicle used solely for competition.

(b) A major source of HAP emissions is a plant site that emits or has the potential to emit any single HAP at a rate of 10 tons (9.07 megagrams) or more per year or any combination of HAP at a rate of 25 tons (22.68 megagrams) or more per year, except that for oil and gas production facilities, a major source of HAP emissions is determined for each surface site.

(c) An area source of HAP emissions is a source that is not a major source.

(d) If you are an owner or operator of an area source subject to this subpart, your status as an entity subject to a standard or other requirements under this subpart does not subject you to the obligation to obtain a permit under 40 CFR part 70 or 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 as applicable.

(e) If you are an owner or operator of a stationary RICE used for national security purposes, you may be eligible to request an exemption from the requirements of this subpart as described in 40 CFR part 1068, subpart C.

§ 63.6590 — What parts of my plant does this subpart cover?

This subpart applies to each affected source.

Section (a) defines an affected source as any **existing, new, or reconstructed stationary** RICE located at a major or area source of HAP emissions, excluding stationary RICE being tested at a stationary RICE test cell/stand.

Sections (1)(i) through (1)(iv) defines **existing** stationary RICE as the following:

> For stationary RICE with a site rating of more than 500 brake horsepower (bhp) located at a major source of HAP emissions, a stationary RICE is existing if you commenced construction or reconstruction of the stationary RICE before December 19, 2002.
>
> For stationary RICE with a site rating of less than or equal to 500 brake bhp located at a major source of HAP emissions, a stationary RICE is existing if you commenced construction or reconstruction of the stationary RICE before June 12, 2006.

For stationary RICE located at an area source of HAP emissions, a stationary RICE is existing if you commenced construction or reconstruction of the stationary RICE before June 12, 2006.

A change in ownership of an existing stationary RICE does not make that stationary RICE a new or reconstructed stationary RICE.

Sections (2)(i) through (2)(iii) defines **new** stationary RICE as the following:

A stationary RICE with a site rating of more than 500 bhp located at a major source of HAP emissions is new if you commenced construction of the stationary RICE on or after December 19, 2002.

A stationary RICE with a site rating of equal to or less than 500 bhp located at a major source of HAP emissions is new if you commenced construction of the stationary RICE on or after June 12, 2006.

A stationary RICE located at an area source of HAP emissions is new if you commenced construction of the stationary RICE on or after June 12, 2006.

Section (3)(i) through (2)(iii) defines **reconstructed** stationary RICE as the following:

A stationary RICE with a site rating of more than 500 bhp located at a major source of HAP emissions is reconstructed if you meet the definition of reconstruction in §63.2 and reconstruction is commenced on or after December 19, 2002.

A stationary RICE with a site rating of equal to or less than 500 bhp located at a major source of HAP emissions is reconstructed if you meet the definition of reconstruction in §63.2 and reconstruction is commenced on or after June 12, 2006.

A stationary RICE located at an area source of HAP emissions is reconstructed if you meet the definition of reconstruction in §63.2 and reconstruction is commenced on or after June 12, 2006.

Section (b) specifies which stationary RICE are subject to limited requirements of this subpart. An affected source which meets either of the criteria in paragraphs (b)(1)(i) through (ii) of this section does not have to meet the requirements of this subpart and of subpart A of this part except for the initial notification requirements of §63.6645(f). The requirements of (b)(1)(i) through (ii) are as follows:

The stationary RICE is a new or reconstructed emergency stationary RICE with a site rating of more than 500 bhp located at a major source of HAP emissions.

The stationary RICE is a new or reconstructed limited use stationary RICE with a site rating of more than 500 bhp located at a major source of HAP emissions.

Section (2) specifies that a new or reconstructed stationary RICE with a site rating of more than 500 bhp located at a major source of HAP emissions which combusts landfill or digester gas equivalent to 10% or more of the gross heat input on an annual basis must meet the initial notification requirements of §63.6645(f) and the requirements of §§63.6625(c), 63.6650(g), and 63.6655(c). These stationary RICE do not have to meet the emission limitations and operating limitations of this subpart.

Section (3) allows that the following stationary RICE do not have to meet the requirements of this subpart and of subpart A of this part, including initial notification requirements:

Existing spark ignition 2-stroke lean-burn (2SLB) stationary RICE with a site rating of more than 500 bhp located at a major source of HAP emissions;

Existing spark ignition 4-stroke lean burn (4SLB) stationary RICE with a site rating of more than 500 bhp located at a major source of HAP emissions;

Existing emergency stationary RICE with a site rating of more than 500 bhp located at a major source of HAP emissions;

Existing limited use stationary RICE with a site rating of more than 500 bhp located at a major source of HAP emissions;

Existing stationary RICE with a site rating of more than 500 bhp located at a major source of HAP emissions that combusts landfill gas or digester gas equivalent to 10% or more of the gross heat input on an annual basis;

Existing residential emergency stationary RICE located at an area source of HAP emissions;

Existing commercial emergency stationary RICE located at an area source of HAP emissions; or

Existing institutional emergency stationary RICE located at an area source of HAP emissions.

As presented previously in the Emissions Units and Control Devices Section previously, the two IC engines at this facility are compression ignition stationary RICE. The Primary IC Engine has a site rating of more than 500 bhp and is located at a area of HAP emissions (see the Emissions Inventories Section). The Backup IC Engine has a site rating of less than 500 bhp and is located at an area of HAP emissions (see the Emissions Inventories Section). Therefore, the Primary IC Engine and the Backup IC Engine are subject to the requirements of Subpart ZZZZ.

§ 63.6595 When do I have to comply with this subpart?

a) Affected sources. (1) If you have an existing stationary RICE, excluding existing non-emergency CI stationary RICE, with a site rating of more than 500 brake HP located at a major source of HAP emissions, you must comply with the applicable emission limitations and operating limitations no later than June 15, 2007. If you have an existing non-emergency CI stationary RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions, an existing stationary CI RICE with a site rating of less than or equal to 500 brake HP located at a major source of HAP emissions, **or an existing stationary CI RICE located at an area source of HAP emissions, you must comply with the applicable emission limitations and operating limitations no later than May 3, 2013.** If you have an existing stationary SI RICE with a site rating of less than or equal to 500 brake HP located at a major source of HAP emissions, or an existing stationary SI RICE located at an area source of HAP emissions, you must comply with the applicable emission limitations and operating limitations no later than October 19, 2013.

These two engines are existing stationary CI RICE located at an area source of HAP emissions. Therefore, the Primary IC Engine and the Backup IC Engine have until May 3, 2013 to comply with the requirements of this subpart. Permit Condition 45 includes the requirement of this section.

§ 63.6603 What emission limitations and operating limitations must I meet if I own or operate an existing stationary RICE located at an area source of HAP emissions?

Compliance with the numerical emission limitations established in this subpart is based on the results of testing the average of three 1-hour runs using the testing requirements and procedures in §63.6620 and Table 4 to this subpart.

(a) If you own or operate an existing stationary RICE located at an area source of HAP emissions, you must comply with the requirements in **Table 2d** to this subpart and the operating limitations in **Table 2b** to this subpart which apply to you.

(b) If you own or operate an existing stationary non-emergency CI RICE greater than 300 HP located at area sources in areas of Alaska not accessible by the Federal Aid Highway System (FAHS) you do not have to meet the numerical CO emission limitations specified in Table 2d to this subpart. Existing stationary non-emergency CI RICE greater than 300 HP located at area sources in areas of Alaska not accessible by the FAHS must meet the management practices that are shown for stationary non-emergency CI RICE less than or equal to 300 HP in Table 2d to this subpart.

As stated in §§63.6600, 63.6601, 63.6630, and 63.6640, you must comply with the following operating limitations for new and reconstructed 2SLB and compression ignition stationary RICE located at a major source of HAP emissions; new and reconstructed 4SLB stationary RICE ≥250 HP located at a major source of HAP emissions; existing compression ignition stationary RICE >500 HP; and existing 4SLB stationary RICE >500 HP located at an area source of HAP emissions that operate more than 24 hours per calendar year:

Table 11 - Table 2bto Subpart ZZZZ of Part 63— Operating Limitations for New and Reconstructed 2SLB and Compression Ignition Stationary RICE >500 HP Located at a Major Source of HAP Emissions, New and Reconstructed 4SLB Stationary RICE ≥250 HP Located at a Major Source of HAP Emissions, Existing Compression Ignition Stationary RICE >500 HP, and Existing 4SLB Stationary RICE >500 HP Located at an Area Source of HAP Emissions

For Each	You Must Meet the Following Operating Limitiation
2. 2SLB and 4SLB stationary RICE and CI stationary RICE complying with the requirement to reduce CO emissions and not using an oxidation catalyst; or 2SLB and 4SLB stationary RICE and CI stationary RICE complying with the requirement to limit the concentration of formaldehyde in the stationary RICE exhaust and not using an oxidation catalyst; or 4SLB stationary RICE and CI stationary RICE complying with the requirement to limit the concentration of CO in the stationary RICE exhaust and not using an oxidation catalyst	Comply with any operating limitations approved by the Administrator.

As stated in §63.6603 and §63.6640, you must comply with the following requirements for existing stationary RICE located at area sources of HAP emissions:

Table 12 - Table 2d to Subpart ZZZZ of Part 63 — Requirements for Existing Stationary RICE Located at Area Sources of HAP Emissions

For Each	You Must Meet the Following Operating Limitation	During periods of startup you must . . .
1. Non-Emergency, non-black start CI stationary RICE ≤300 HP	a. Change oil and filter every 1,000 hours of operation or annually, whichever comes first;[1] b. Inspect air cleaner every 1,000 hours of operation or annually, whichever comes first; c. Inspect all hoses and belts every 500 hours of operation or annually, whichever comes first, and replace as necessary.	Minimize the engine's time spent at idle and minimize the engine's startup time at startup to a period needed for appropriate and safe loading of the engine, not to exceed 30 minutes, after which time the non-startup emission limitations apply.
3. Non-Emergency, non-black start CI stationary RICE >500 HP	a. Limit concentration of CO in the stationary RICE exhaust to 23 ppmvd at 15 percent O2; or b. Reduce CO emissions by 70 percent or more.	

1 Sources have the option to utilize an oil analysis program as described in §63.6625(i) in order to extend the specified oil change requirement in Table 2d of this subpart.

2 If an emergency engine is operating during an emergency and it is not possible to shut down the engine in order to perform the management practice requirements on the schedule required in Table 2d of this subpart, or if performing the management practice on the required schedule would otherwise pose an unacceptable risk under Federal, State, or local law, the management practice can be delayed until the emergency is over or the unacceptable risk under Federal, State, or local law has abated. The management practice should be performed as soon as practicable after the emergency has ended or the unacceptable risk under Federal, State, or local law has abated. Sources must report any failure to perform the management practice on the schedule required and the Federal, State or local law under which the risk was deemed unacceptable.

Permit Conditions 46, 47, and 48 includes the requirements of this section.

§ 63.6604 What fuel requirements must I meet if I own or operate an existing stationary CI RICE?

If you own or operate an existing non-emergency, non-black start CI stationary RICE with a site rating of more than 300 brake HP with a displacement of less than 30 liters per cylinder that uses diesel fuel, you must use diesel fuel that meets the requirements in 40 CFR 80.510(b) for non-road diesel fuel. Existing non-emergency CI stationary RICE located in Guam, American Samoa, the Commonwealth of the Northern Mariana Islands, or at area sources in areas of Alaska not accessible by the FAHS are exempt from the requirements of this section.

Permit Condition 44 includes the requirements of this section.

§ 63.6605 What are my general requirements for complying with this subpart?

(a) You must be in compliance with the emission limitations and operating limitations in this subpart that apply to you at all times.

(b) At all times you must operate and maintain any affected source, including associated air pollution control equipment and monitoring equipment, in a manner consistent with safety and good air pollution control practices for minimizing emissions. The general duty to minimize emissions does not require you to make any further efforts to reduce emissions if levels required by this standard have been achieved. Determination of whether such operation and maintenance procedures are being used will be based on information available to the Administrator which may include, but is not limited to, monitoring results, review of operation and maintenance procedures, review of operation and maintenance records, and inspection of the source.

This is a general permit requirement which is included in the Permit to Construct General Provisions – General Compliance.

§ 63.6612 By what date must I conduct the initial performance tests or other initial compliance demonstrations if I own or operate an existing stationary RICE with a site rating of less than or equal to 500 brake HP located at a major source of HAP emissions or an existing stationary RICE located at an area source of HAP emissions?

If you own or operate an existing stationary RICE with a site rating of less than or equal to 500 brake HP located at a major source of HAP emissions **or an existing stationary RICE located at an area source of HAP emissions you are subject to the requirements of this section.**

(a) You must conduct any initial performance test or other initial compliance demonstration according to **Tables 4 and 5** to this subpart that apply to you within 180 days after the compliance date that is specified for your stationary RICE in §63.6595 and according to the provisions in §63.7(a)(2).

(b) An owner or operator is not required to conduct an initial performance test on a unit for which a performance test has been previously conducted, but the test must meet all of the conditions described in paragraphs (b)(1) through (4) of this section.

(1) The test must have been conducted using the same methods specified in this subpart, and these methods must have been followed correctly.

(2) The test must not be older than 2 years.

(3) The test must be reviewed and accepted by the Administrator.

(4) Either no process or equipment changes must have been made since the test was performed, or the owner or operator must be able to demonstrate that the results of the performance test, with or without adjustments, reliably demonstrate compliance despite process or equipment changes.

As stated in §§63.6610, 63.6611, 63.6612, 63.6620, and 63.6640, you must comply with the following requirements for performance tests for stationary RICE:

Table 13- Table 4 to Subpart ZZZZ of Part 63—Requirements for Performance Tests

For Each..	Complying with therequirement to . . .	You must . . .	Using . . .	According to the following requirements . . .
1. 2SLB, 4SLB, and CI stationary RICE	a. Reduce CO emissions	i. Measure the O_2 at the inlet and outlet of the control device; and	(1) Portable CO and O_2 analyzer	(a) Using ASTM D6522–00 (2005) a(incorporated by reference, see §63.14). Measurements to determine O_2 must be made at the same time as the measurements for CO concentration.
		ii. Measure the CO at the inlet and the outlet of the control device	(1) Portable CO and O_2 analyzer	(a) Using ASTM D6522–00 (2005) ab(incorporated by reference, see §63.14) or Method 10 of 40 CFR appendix A. The CO concentration must be at 15 percent O_2, dry basis.
3. Stationary RICE	a. Limit the concentration of formaldehyde or CO in the stationary RICE exhaust	i. Select the sampling port location and the number of traverse points; and	(1) Method 1 or 1A of 40 CFR part 60, appendix A §63.7(d)(1)(i)	(a) If using a control device, the sampling site must be located at the outlet of the control device.
		ii. Determine the O_2 concentration of the stationary RICE exhaust at the sampling port location; and	(1) Method 3 or 3A or 3B of 40 CFR part 60, appendix A, or ASTM Method D6522–00 (2005)	(a) Measurements to determine O_2 concentration must be made at the same time and location as the measurements for formaldehyde concentration.
		iii. Measure moisture content of the stationary RICE exhaust at the sampling port location; and	(1) Method 4 of 40 CFR part 60, appendix A, or Test Method 320 of 40 CFR part 63, appendix A, or ASTM D 6348–03	(a) Measurements to determine moisture content must be made at the same time and location as the measurements for formaldehyde concentration.
		iv. Measure formaldehyde at the exhaust of the stationary RICE; or	(1) Method 320 or 323 of 40 CFR part 63, appendix A; or ASTM D6348–03, [c]provided in ASTM D6348–03 Annex A5 (Analyte Spiking Technique), the percent R must be greater than or equal to 70 and less than or equal to 130	(a) Formaldehyde concentration must be at 15 percent O_2, dry basis. Results of this test consist of the average of the three 1-hour or longer runs.
		v. Measure CO at the exhaust of the stationary RICE	(1) Method 10 of 40 CFR part 60, appendix A, ASTM Method D6522–00 (2005),[a] Method 320 of 40 CFR part 63, appendix A, or ASTM D6348–03	(a) CO Concentration must be at 15 percent O_2, dry basis. Results of this test consist of the average of the three 1-hour longer runs.

[a] You may also use Methods 3A and 10 as options to ASTM–D6522–00 (2005). You may obtain a copy of ASTM–D6522–00 (2005) from at least one of the following addresses: American Society for Testing and Materials, 100 Barr Harbor Drive, West Conshohocken, PA 19428–2959, or University Microfilms International, 300 North Zeeb Road, Ann Arbor, MI 48106. ASTM–D6522–00 (2005) may be used to test both CI and SI stationary RICE.

[b] You may also use Method 320 of 40 CFR part 63, appendix A, or ASTM D6348–03.

[c] You may obtain a copy of ASTM–D6348–03 from at least one of the following addresses: American Society for Testing and Materials, 100 Barr Harbor Drive, West Conshohocken, PA 19428–2959, or University Microfilms International, 300 North Zeeb Road, Ann Arbor, MI 48106.

Permit Conditions 49, 50, and 51 includes the requirements of this section.

§ 63.6615 When must I conduct subsequent performance tests?

If you must comply with the emission limitations and operating limitations, you must conduct subsequent performance tests as specified in Table 3 of this subpart.

Table 14 - Table 3 to Subpart ZZZZ of Part 63—Subsequent Performance Tests

For Each	You Must Meet the Following Operating Limitiation	During periods of startup you must . . .
4. Existing non-emergency, non-black start CI stationary RICE with a brake horsepower >500 that are not limited use stationary RICE; existing non-emergency, non-black start 4SLB and 4SRB stationary RICE located at an area source of HAP emissions with a brake horsepower >500 that are operated more than 24 hours per calendar year that are not limited use stationary RICE	Limit or reduce CO or formaldehyde emissions	Conduct subsequent performance tests every 8,760 hrs. or 3 years, whichever comes first.

Permit Condition 51 includes the requirements of this section.

§ 63.6620 What performance tests and other procedures must I use?

(a) You must conduct each performance test in Tables 3 and 4 of this subpart that applies to you.

(b) Each performance test must be conducted according to the requirements that this subpart specifies in Table 4 to this subpart. If you own or operate a non-operational stationary RICE that is subject to performance testing, you do not need to start up the engine solely to conduct the performance test. Owners and operators of a non-operational engine can conduct the performance test when the engine is started up again.

(d) You must conduct three separate test runs for each performance test required in this section, as specified in §63.7(e)(3). Each test run must last at least 1 hour.

(e)(1) You must use Equation 1 of this section to determine compliance with the percent reduction requirement:

$$[(C_i - C_o) \div C_i] \times 100 = R \text{ (Eq. 1)}$$

Where:

C_i = concentration of CO or formaldehyde at the control device inlet,

C_o = concentration of CO or formaldehyde at the control device outlet, and

R = percent reduction of CO or formaldehyde emissions.

(2) You must normalize the carbon monoxide (CO) or formaldehyde concentrations at the inlet and outlet of the control device to a dry basis and to 15 percent oxygen, or an equivalent percent carbon dioxide (CO_2). If pollutant concentrations are to be corrected to 15 percent oxygen and CO_2 concentration is measured in lieu of oxygen concentration measurement, a CO_2 correction factor is needed. Calculate the CO_2 correction factor as described in paragraphs (e)(2)(i) through (iii) of this section.

(i) Calculate the fuel-specific F_o value for the fuel burned during the test using values obtained from Method 19, section 5.2, and the following equation:

$$F_o = (0.209 \times F_d) \div F_c \text{ (Eq. 2)}$$

Where:

F_o = Fuel factor based on the ratio of oxygen volume to the ultimate CO_2 volume produced by the fuel at zero percent excess air.

0.209 = Fraction of air that is oxygen, percent/100.

F_d = Ratio of the volume of dry effluent gas to the gross calorific value of the fuel from Method 19, dsm3 /J (dscf/106 Btu).

F_c = Ratio of the volume of CO_2 produced to the gross calorific value of the fuel from Method 19, dsm3 /J (dscf/106 Btu).

(ii) Calculate the CO_2 correction factor for correcting measurement data to 15 percent oxygen, as follows:

$X_{CO2} = 5.9 \div F_o$ (Eq. 3)

Where:

X_{CO2} = CO_2 correction factor, percent.

5.9 = 20.9 percent O_2 − 15 percent O_2, the defined O_2 correction value, percent.

(iii) Calculate the NO_X and SO_2 gas concentrations adjusted to 15 percent O_2 using CO_2 as follows:

$C_{adj} = C_d$ x $(X_{CO2} \div \%CO_2$ (Eq. 4)

Where:

$\%CO_2$ = Measured CO_2 concentration measured, dry basis, percent.

Permit Condition 52 includes the requirements of this section.

(f) If you comply with the emission limitation to reduce CO and you are not using an oxidation catalyst, if you comply with the emission limitation to reduce formaldehyde and you are not using NSCR, or if you comply with the emission limitation to limit the concentration of formaldehyde in the stationary RICE exhaust and you are not using an oxidation catalyst or NSCR, you must petition the Administrator for operating limitations to be established during the initial performance test and continuously monitored thereafter; or for approval of no operating limitations. You must not conduct the initial performance test until after the petition has been approved by the Administrator.

(g) If you petition the Administrator for approval of operating limitations, your petition must include the information described in paragraphs (g)(1) through (5) of this section.

(1) Identification of the specific parameters you propose to use as operating limitations;

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

(3) 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;

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

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

(h) If you petition the Administrator for approval of no operating limitations, your petition must include the information described in paragraphs (h)(1) through (7) of this section.

(1) Identification of the parameters associated with operation of the stationary RICE and any emission control device which could change intentionally (e.g., operator adjustment, automatic controller adjustment, etc.) or unintentionally (e.g., wear and tear, error, etc.) on a routine basis or over time;

(2) A discussion of the relationship, if any, between changes in the parameters and changes in HAP emissions;

(3) For the parameters which could change in such a way as to increase HAP emissions, a discussion of whether establishing limitations on the parameters would serve to limit HAP emissions;

(4) For the parameters which could change in such a way as to increase HAP emissions, a discussion of how you could establish upper and/or lower values for the parameters which would establish limits on the parameters in operating limitations;

(5) For the parameters, a discussion identifying the methods you could use to measure them and the instruments you could use to monitor them, as well as the relative accuracy and precision of the methods and instruments;

(6) For the parameters, a discussion identifying the frequency and methods for recalibrating the instruments you could use to monitor them; and

(7) A discussion of why, from your point of view, it is infeasible or unreasonable to adopt the parameters as operating limitations.

(i) The engine percent load during a performance test must be determined by documenting the calculations, assumptions, and measurement devices used to measure or estimate the percent load in a specific application. A written report of the average percent load determination must be included in the notification of compliance status. The following information must be included in the written report: the engine model number, the engine manufacturer, the year of purchase, the manufacturer's site-rated brake horsepower, the ambient temperature, pressure, and humidity during the performance test, and all assumptions that were made to estimate or calculate percent load during the performance test must be clearly explained. If measurement devices such as flow meters, kilowatt meters, beta analyzers, stain gauges, etc. are used, the model number of the measurement device, and an estimate of its accurate in percentage of true value must be provided.

Permit Condition 53 includes the requirements of this section.

§ 63.6625 What are my monitoring, installation, collection, operation, and maintenance requirements?

(a) If you elect to install a CEMS as specified in Table 5 of this subpart, you must install, operate, and maintain a CEMS to monitor CO and either oxygen or CO_2 at both the inlet and the outlet of the control device according to the requirements in paragraphs (a)(1) through (4) of this section.

(1) Each CEMS must be installed, operated, and maintained according to the applicable performance specifications of 40 CFR part 60, appendix B.

(2) You must conduct an initial performance evaluation and an annual relative accuracy test audit (RATA) of each CEMS according to the requirements in §63.8 and according to the applicable performance specifications of 40 CFR part 60, appendix B as well as daily and periodic data quality checks in accordance with 40 CFR part 60, appendix F, procedure 1.

(3) As specified in §63.8(c)(4)(ii), each CEMS must complete a minimum of one cycle of operation (sampling, analyzing, and data recording) for each successive 15-minute period. You must have at least two data points, with each representing a different 15-minute period, to have a valid hour of data.

(4) The CEMS data must be reduced as specified in §63.8(g)(2) and recorded in parts per million or parts per billion (as appropriate for the applicable limitation) at 15 percent oxygen or the equivalent CO2concentration.

The Applicant has not proposed a CEMS for the engines included in the application. Therefore, this section is not applicable.

(b) If you are required to install a continuous parameter monitoring system (CPMS) as specified in Table 5 of this subpart, you must install, operate, and maintain each CPMS according to the requirements in paragraphs (b)(1) through (8) of this section.

(1) The CPMS must complete a minimum of one cycle of operation for each successive 15-minute period. You must have a minimum of four successive cycles of operation to have a valid hour of data.

(2) Except for monitoring malfunctions, associated repairs, and required quality assurance or control activities (including, as applicable, calibration checks and required zero and span adjustments), you must conduct all monitoring in continuous operation at all times that the unit is operating. A monitoring malfunction is any sudden, infrequent, not reasonably preventable failure of the monitoring to provide valid data. Monitoring failures that are caused in part by poor maintenance or careless operation are not malfunctions.

(3) For purposes of calculating data averages, you must not use data recorded during monitoring malfunctions, associated repairs, out of control periods, or required quality assurance or control activities. You must use all the data collected during all other periods in assessing compliance. Any 15-minute period for which the monitoring system is out-of-control and data are not available for required calculations constitutes a deviation from the monitoring requirements.

(4) Determine the 3-hour block average of all recorded readings, except as provided in paragraph (b)(3) of this section.

(5) Record the results of each inspection, calibration, and validation check.

(6) You must develop a site-specific monitoring plan that addresses paragraphs (b)(6)(i) through (vi) of this section.

(i) Installation of the CPMS sampling probe or other interface at the appropriate location to obtain representative measurements;

(ii) Performance and equipment specifications for the sample interface, parametric signal analyzer, and the data collection and reduction systems;

(iii) Performance evaluation procedures and acceptance criteria (e.g., calibrations);

(iv) Ongoing operation and maintenance procedures in accordance with the general requirements of §63.8(c)(1), (c)(3), and (c)(4)(ii);

(v) Ongoing data quality assurance procedures in accordance with the general requirements of §63.8(d); and

(vi) Ongoing recordkeeping and reporting procedures in accordance with the general requirements of §63.10(c), (e)(1), and (e)(2)(i).

(7) You must conduct a performance evaluation of each CPMS in accordance with your site-specific monitoring plan.

(8) You must operate and maintain the CPMS in continuous operation according to the site-specific monitoring plan.

Permit Condition 54 includes the requirements of this section.

(c) If you are operating a new or reconstructed stationary RICE which fires landfill gas or digester gas equivalent to 10 percent or more of the gross heat input on an annual basis, you must monitor and record your fuel usage daily with separate fuel meters to measure the volumetric flow rate of each fuel. In addition, you must operate your stationary RICE in a manner which reasonably minimizes HAP emissions.

The Applicant has not proposed to fire the engines included in the application on landfill or digester gas. Therefore, this section is not applicable.

(d) If you are operating a new or reconstructed emergency 4SLB stationary RICE with a site rating of greater than or equal to 250 and less than or equal to 500 brake HP located at a major source of HAP emissions, you must install a non-resettable hour meter prior to the startup of the engine.

The Applicant has not proposed any 4SLB engines in the application. Therefore, this section is not applicable.

(e) If you own or operate any of the following stationary RICE, you must operate and maintain the stationary RICE and after-treatment control device (if any) according to the manufacturer's emission-related written instructions or develop your own maintenance plan which must provide to the extent practicable for the maintenance and operation of the engine in a manner consistent with good air pollution control practice for minimizing emissions:

(1) An existing stationary RICE with a site rating of less than 100 HP located at a major source of HAP emissions;

(2) An existing emergency or black start stationary RICE with a site rating of less than or equal to 500 HP located at a major source of HAP emissions;

(3) An existing emergency or black start stationary RICE located at an area source of HAP emissions;

The Applicant has proposed an existing emergency or black start stationary RICE located at an area source of HAP emissions in the application. Therefore, this section is applicable.

(4) An existing non-emergency, non-black start stationary CI RICE with a site rating less than or equal to 300 HP located at an area source of HAP emissions;

(5) An existing non-emergency, non-black start 2SLB stationary RICE located at an area source of HAP emissions;

(6) An existing non-emergency, non-black start landfill or digester gas stationary RICE located at an area source of HAP emissions;

(7) An existing non-emergency, non-black start 4SLB stationary RICE with a site rating less than or equal to 500 HP located at an area source of HAP emissions;

(8) An existing non-emergency, non-black start 4SRB stationary RICE with a site rating less than or equal to 500 HP located at an area source of HAP emissions;

(9) An existing, non-emergency, non-black start 4SLB stationary RICE with a site rating greater than 500 HP located at an area source of HAP emissions that is operated 24 hours or less per calendar year; and

(10) An existing, non-emergency, non-black start 4SRB stationary RICE with a site rating greater than 500 HP located at an area source of HAP emissions that is operated 24 hours or less per calendar year.

Permit Condition 55 includes the requirements of this section.

(f) If you own or operate an existing emergency stationary RICE with a site rating of less than or equal to 500 brake HP located at a major source of HAP emissions or an existing emergency stationary RICE located at an area source of HAP emissions, you must install a non-resettable hour meter if one is not already installed.

Permit Condition 56 includes the requirements of this section.

(g) If you own or operate an existing non-emergency, non-black start CI engine greater than or equal to 300 HP that is not equipped with a closed crankcase ventilation system, you must comply with either paragraph (g)(1) or paragraph (g)(2) of this section. Owners and operators must follow the manufacturer's specified maintenance requirements for operating and maintaining the open or closed crankcase ventilation systems and replacing the crankcase filters, or can request the Administrator to approve different maintenance requirements that are as protective as manufacturer requirements. Existing CI engines located at area sources in areas of Alaska not accessible by the FAHS do not have to meet the requirements of paragraph (g) of this section.

(1) Install a closed crankcase ventilation system that prevents crankcase emissions from being emitted to the atmosphere, or

(2) Install an open crankcase filtration emission control system that reduces emissions from the crankcase by filtering the exhaust stream to remove oil mist, particulates, and metals.

Permit Condition 57 includes the requirements of this section.

(h) If you operate a new, reconstructed, or existing stationary engine, you must minimize the engine's time spent at idle during startup and minimize the engine's startup time to a period needed for appropriate and safe loading of the engine, not to exceed 30 minutes, after which time the emission standards applicable to all times other than startup in Tables 1a, 2a, 2c, and 2d to this subpart apply.

As discussed previously Permit Condition 46 includes the requirements of this section.

(i) If you own or operate a stationary CI engine that is subject to the work, operation or management practices in items 1 or 2 of Table 2c to this subpart or in items 1 or 4 of Table 2d to this subpart, you have the option of utilizing an oil analysis program in order to extend the specified oil change requirement in Tables 2c and 2d to this subpart. The oil analysis must be performed at the same frequency specified for changing the oil in Table 2c or 2d to this subpart. The analysis program must at a minimum analyze the following three parameters: Total Base Number, viscosity, and percent water content. The condemning limits for these parameters are as follows: Total Base Number is less than 30 percent of the Total Base Number of the oil when new; viscosity of the oil has changed by more than 20 percent from the viscosity of the oil when new; or percent water content (by volume) is greater than 0.5. If all of these condemning limits are not exceeded, the engine owner or operator is not required to change the oil. If any of the limits are exceeded, the engine owner or operator must change the oil within 2 days of receiving the results of the analysis; if the engine is not in operation when the results of the analysis are received, the engine owner or operator must change the oil within 2 days or before commencing operation, whichever is later. The owner or operator must keep records of the parameters that are analyzed as part of the program, the results of the analysis, and the oil changes for the engine. The analysis program must be part of the maintenance plan for the engine.

(j) If you own or operate a stationary SI engine that is subject to the work, operation or management practices in items 6, 7, or 8 of Table 2c to this subpart or in items 5, 6, 7, 9, or 11 of Table 2d to this subpart, you have the option of utilizing an oil analysis program in order to extend the specified oil change requirement in Tables 2c and 2d to this subpart. The oil analysis must be performed at the same frequency specified for changing the oil in Table 2c or 2d to this subpart. The analysis program must at a minimum analyze the following three parameters: Total Acid Number, viscosity, and percent water content. The condemning limits for these parameters are as follows: Total Acid Number increases by more than 3.0 milligrams of potassium hydroxide (KOH) per gram from Total Acid Number of the oil when new; viscosity of the oil has changed by more than 20 percent from the viscosity of the oil when new; or percent water content (by volume) is greater than 0.5. If all of these condemning limits are not exceeded, the engine owner or operator is not required to change the oil. If any of the limits are exceeded, the engine owner or operator must change the oil within 2 days of receiving the results of the analysis; if the engine is not in operation when the results of the analysis are received, the engine owner or operator must change the oil within 2 days or before commencing operation, whichever is later. The owner or operator must keep records of the parameters that are analyzed as part of the program, the results of the analysis, and the oil changes for the engine. The analysis program must be part of the maintenance plan for the engine.

The Applicant has not proposed an oil analysis program in the application. Therefore, these sections are not applicable.

(k) If you have an operating limitation that requires the use of a temperature measurement device, you must meet the requirements in paragraphs (k)(1) through (4) of this section.

(1) Locate the temperature sensor and other necessary equipment in a position that provides a representative temperature.

(2) Use a temperature sensor with a minimum tolerance of 2.8 degrees Celsius (5 degrees Fahrenheit), or 1.0 percent of the temperature value, whichever is larger, for a non-cryogenic temperature range.

(3) Use a temperature sensor with a minimum tolerance of 2.8 degrees Celsius (5 degrees Fahrenheit), or 2.5 percent of the temperature value, whichever is larger, for a cryogenic temperature range.

(4) Conduct a temperature measurement device calibration check at least every 3 months.

Permit Condition 58 includes the requirements of this section.

§ 63.6630 How do I demonstrate initial compliance with the emission limitations and operating limitations?

(a) You must demonstrate initial compliance with each emission and operating limitation that applies to you according to **Table 5** of this subpart.

(b) During the initial performance test, you must establish each operating limitation in Tables 1b and 2b of this subpart that applies to you.

(c) You must submit the Notification of Compliance Status containing the results of the initial compliance demonstration according to the requirements in §63.6645.

Table 15 - Table 5 to Subpart ZZZZ of Part 63—Initial Compliance With Emission Limitations and Operating Limitations

For Each	Complying with the requirement to . . .	You have demonstrated initial compliance if . . .
1. New or reconstructed non-emergency 2SLB stationary RICE >500 HP located at a major source of HAP, new or reconstructed non-emergency 4SLB stationary RICE ≥250 HP located at a major source of HAP, non-emergency stationary CI RICE >500 HP located at a major source of HAP, existing non-emergency stationary CI RICE >500 HP located at an area source of HAP, and existing non-emergency 4SLB stationary RICE >500 HP located at an area source of HAP that are operated more than 24 hours per calendar year	a. Reduce CO emissions and using oxidation catalyst, and using a CPMS	i. The average reduction of emissions of CO determined from the initial performance test achieves the required CO percent reduction; and ii. You have installed a CPMS to continuously monitor catalyst inlet temperature according to the requirements in §63.6625(b); and iii. You have recorded the catalyst pressure drop and catalyst inlet temperature during the initial performance test.

Permit Condition 59 includes the requirements of this section.

§ 63.6645 What notifications must I submit and when?

(a) You must submit all of the notifications in §§63.7(b) and (c), 63.8(e), (f)(4) and (f)(6), 63.9(b) through (e), and (g) and (h) that apply to you by the dates specified if you own or operate any of the following;

(1) An existing stationary RICE with a site rating of less than or equal to 500 brake HP located at a major source of HAP emissions.

(2) An existing stationary RICE located at an area source of HAP emissions.

(3) A stationary RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions.

(4) A new or reconstructed 4SLB stationary RICE with a site rating of greater than or equal to 250 HP located at a major source of HAP emissions.

(5) This requirement does not apply if you own or operate an existing stationary RICE less than 100 HP, an existing stationary emergency RICE, or an existing stationary RICE that is not subject to any numerical emission standards.

(b) As specified in §63.9(b)(2), if you start up your stationary RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions before the effective date of this subpart, you must submit an Initial Notification not later than December 13, 2004.

(c) If you start up your new or reconstructed stationary RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions on or after August 16, 2004, you must submit an Initial Notification not later than 120 days after you become subject to this subpart.

(d) As specified in §63.9(b)(2), if you start up your stationary RICE with a site rating of equal to or less than 500 brake HP located at a major source of HAP emissions before the effective date of this subpart and you are required to submit an initial notification, you must submit an Initial Notification not later than July 16, 2008.

(e) If you start up your new or reconstructed stationary RICE with a site rating of equal to or less than 500 brake HP located at a major source of HAP emissions on or after March 18, 2008 and you are required to submit an initial notification, you must submit an Initial Notification not later than 120 days after you become subject to this subpart.

(f) If you are required to submit an Initial Notification but are otherwise not affected by the requirements of this subpart, in accordance with §63.6590(b), your notification should include the information in §63.9(b)(2)(i) through (v), and a statement that your stationary RICE has no additional requirements and explain the basis of the exclusion (for example, that it operates exclusively as an emergency stationary RICE if it has a site rating of more than 500 brake HP located at a major source of HAP emissions).

Permit Condition 60 includes the requirements of this section.

(g) If you are required to conduct a performance test, you must submit a Notification of Intent to conduct a performance test at least 60 days before the performance test is scheduled to begin as required in §63.7(b)(1).

Permit Condition 51 includes the requirements of this section.

(h) If you are required to conduct a performance test or other initial compliance demonstration as specified in Tables 4 and 5 to this subpart, you must submit a Notification of Compliance Status according to §63.9(h)(2)(ii).

(1) For each initial compliance demonstration required in Table 5 to this subpart that does not include a performance test, you must submit the Notification of Compliance Status before the close of business on the 30th day following the completion of the initial compliance demonstration.

(2) For each initial compliance demonstration required in Table 5 to this subpart that includes a performance test conducted according to the requirements in Table 3 to this subpart, you must submit the Notification of Compliance Status, including the performance test results, before the close of business on the 60th day following the completion of the performance test according to §63.10(d)(2).

Permit Condition 60 includes the requirements of this section.

§ 63.6650 What reports must I submit and when?

(a) You must submit each report in Table 7 of this subpart that applies to you.

(b) Unless the Administrator has approved a different schedule for submission of reports under §63.10(a), you must submit each report by the date in Table 7 of this subpart and according to the requirements in paragraphs (b)(1) through (b)(9) of this section.

(1) For semiannual Compliance reports, the first Compliance report must cover the period beginning on the compliance date that is specified for your affected source in §63.6595 and ending on June 30 or December 31, whichever date is the first date following the end of the first calendar half after the compliance date that is specified for your source in §63.6595.

(2) For semiannual Compliance reports, the first Compliance report must be postmarked or delivered no later than July 31 or January 31, whichever date follows the end of the first calendar half after the compliance date that is specified for your affected source in §63.6595.

(3) For semiannual Compliance reports, each subsequent Compliance report must cover the semiannual reporting period from January 1 through June 30 or the semiannual reporting period from July 1 through December 31.

(4) For semiannual Compliance reports, each subsequent Compliance report must be postmarked or delivered no later than July 31 or January 31, whichever date is the first date following the end of the semiannual reporting period.

(5) For each stationary RICE that is subject to permitting regulations pursuant to 40 CFR part 70 or 71, and if the permitting authority has established dates for submitting semiannual reports pursuant to 40 CFR 70.6(a)(3)(iii)(A) or 40 CFR 71.6 (a)(3)(iii)(A), you may submit the first and subsequent Compliance reports according to the dates the permitting authority has established instead of according to the dates in paragraphs (b)(1) through (b)(4) of this section.

(6) For annual Compliance reports, the first Compliance report must cover the period beginning on the compliance date that is specified for your affected source in §63.6595 and ending on December 31.

(7) For annual Compliance reports, the first Compliance report must be postmarked or delivered no later than January 31 following the end of the first calendar year after the compliance date that is specified for your affected source in §63.6595.

(8) For annual Compliance reports, each subsequent Compliance report must cover the annual reporting period from January 1 through December 31.

(9) For annual Compliance reports, each subsequent Compliance report must be postmarked or delivered no later than January 31.

(c) The Compliance report must contain the information in paragraphs (c)(1) through (6) of this section.

(1) Company name and address.

(2) Statement by a responsible official, with that official's name, title, and signature, certifying the accuracy of the content of the report.

(3) Date of report and beginning and ending dates of the reporting period.

(4) If you had a malfunction during the reporting period, the compliance report must include the number, duration, and a brief description for each type of malfunction which occurred during the reporting period and which caused or may have caused any applicable emission limitation to be exceeded. The report must also include a description of actions taken by an owner or operator during a malfunction of an affected source to minimize emissions in accordance with §63.6605(b), including actions taken to correct a malfunction.

(5) If there are no deviations from any emission or operating limitations that apply to you, a statement that there were no deviations from the emission or operating limitations during the reporting period.

(6) If there were no periods during which the continuous monitoring system (CMS), including CEMS and CPMS, was out-of-control, as specified in §63.8(c)(7), a statement that there were no periods during which the CMS was out-of-control during the reporting period.

(d) For each deviation from an emission or operating limitation that occurs for a stationary RICE where you are not using a CMS to comply with the emission or operating limitations in this subpart, the Compliance report must contain the information in paragraphs (c)(1) through (4) of this section and the information in paragraphs (d)(1) and (2) of this section.

(1) The total operating time of the stationary RICE at which the deviation occurred during the reporting period.

(2) Information on the number, duration, and cause of deviations (including unknown cause, if applicable), as applicable, and the corrective action taken.

(e) For each deviation from an emission or operating limitation occurring for a stationary RICE where you are using a CMS to comply with the emission and operating limitations in this subpart, you must include information in paragraphs (c)(1) through (4) and (e)(1) through (12) of this section.

(1) The date and time that each malfunction started and stopped.

(2) The date, time, and duration that each CMS was inoperative, except for zero (low-level) and high-level checks.

(3) The date, time, and duration that each CMS was out-of-control, including the information in §63.8(c)(8).

(4) The date and time that each deviation started and stopped, and whether each deviation occurred during a period of malfunction or during another period.

(5) A summary of the total duration of the deviation during the reporting period, and the total duration as a percent of the total source operating time during that reporting period.

(6) A breakdown of the total duration of the deviations during the reporting period into those that are due to control equipment problems, process problems, other known causes, and other unknown causes.

(7) A summary of the total duration of CMS downtime during the reporting period, and the total duration of CMS downtime as a percent of the total operating time of the stationary RICE at which the CMS downtime occurred during that reporting period.

(8) An identification of each parameter and pollutant (CO or formaldehyde) that was monitored at the stationary RICE.

(9) A brief description of the stationary RICE.

(10) A brief description of the CMS.

(11) The date of the latest CMS certification or audit.

(12) A description of any changes in CMS, processes, or controls since the last reporting period.

(f) Each affected source that has obtained a title V operating permit pursuant to 40 CFR part 70 or 71 must report all deviations as defined in this subpart in the semiannual monitoring report required by 40 CFR 70.6 (a)(3)(iii)(A) or 40 CFR 71.6(a)(3)(iii)(A). If an affected source submits a Compliance report pursuant to Table 7 of this subpart along with, or as part of, the semiannual monitoring report required by 40 CFR 70.6(a)(3)(iii)(A) or 40 CFR 71.6(a)(3)(iii)(A), and the Compliance report includes all required information concerning deviations from any emission or operating limitation in this subpart, submission of the Compliance report shall be deemed to satisfy any obligation to report the same deviations in the semiannual monitoring report. However, submission of a Compliance report shall not otherwise affect any obligation the affected source may have to report deviations from permit requirements to the permit authority.

(g) If you are operating as a new or reconstructed stationary RICE which fires landfill gas or digester gas equivalent to 10 percent or more of the gross heat input on an annual basis, you must submit an annual report according to Table 7 of this subpart by the date specified unless the Administrator has approved a different schedule, according to the information described in paragraphs (b)(1) through (b)(5) of this section. You must report the data specified in (g)(1) through (g)(3) of this section.

(1) Fuel flow rate of each fuel and the heating values that were used in your calculations. You must also demonstrate that the percentage of heat input provided by landfill gas or digester gas is equivalent to 10 percent or more of the total fuel consumption on an annual basis.

(2) The operating limits provided in your federally enforceable permit, and any deviations from these limits.

(3) Any problems or errors suspected with the meters.

As stated in §63.6650, you must comply with the following requirements for reports:

Table 16 - Table 7 to Subpart ZZZZ of Part 63—Requirements for Reports

For Each..	You must submit a ...	The report must contain ...	You must submit the report ...
1. Existing non-emergency, non-black start stationary RICE 100≤HP≤500 located at a major source of HAP; existing non-emergency, non-black start stationary CI RICE >500 HP located at a major source of HAP; existing non-emergency 4SRB stationary RICE >500 HP located at a major source of HAP; existing non-emergency, non-black start stationary CI RICE >300 HP located at an area source of HAP; existing non-emergency, non-black start 4SLB and 4SRB stationary RICE >500 HP located at an area source of HAP and operated more than 24 hours per calendar year; new or reconstructed non-emergency stationary RICE >500 HP located at a major source of HAP; and new or reconstructed non-emergency 4SLB stationary RICE 250≤HP≤500 located at a major source of HAP	Compliance report	a. If there are no deviations from any emission limitations or operating limitations that apply to you, a statement that there were no deviations from the emission limitations or operating limitations during the reporting period. If there were no periods during which the CMS, including CEMS and CPMS, was out-of-control, as specified in §63.8(c)(7), a statement that there were not periods during which the CMS was out-of-control during the reporting period; or b. If you had a deviation from any emission limitation or operating limitation during the reporting period, the information in §63.6650(d). If there were periods during which the CMS, including CEMS and CPMS, was out-of-control, as specified in §63.8(c)(7), the information in §63.6650(e); or c. If you had a malfunction during the reporting period, the information in §63.6650(c)(4)	i. Semiannually according to the requirements in §63.6650(b)(1)–(5) for engines that are not limited use stationary RICE subject to numerical emission limitations; and ii. Annually according to the requirements in §63.6650(b)(6)–(9) for engines that are limited use stationary RICE subject to numerical emission limitations. i. Semiannually according to the requirements in §63.6650(b). i. Semiannually according to the requirements in §63.6650(b).

Permit Condition 61 includes the requirements of this section.

§ 63.6655 What records must I keep?

(a) If you must comply with the emission and operating limitations, you must keep the records described in paragraphs (a)(1) through (a)(5), (b)(1) through (b)(3) and (c) of this section.

(1) A copy of each notification and report that you submitted to comply with this subpart, including all documentation supporting any Initial Notification or Notification of Compliance Status that you submitted, according to the requirement in §63.10(b)(2)(xiv).

(2) Records of the occurrence and duration of each malfunction of operation (i.e., process equipment) or the air pollution control and monitoring equipment.

(3) Records of performance tests and performance evaluations as required in §63.10(b)(2)(viii).

(4) Records of all required maintenance performed on the air pollution control and monitoring equipment.

(5) Records of actions taken during periods of malfunction to minimize emissions in accordance with §63.6605(b), including corrective actions to restore malfunctioning process and air pollution control and monitoring equipment to its normal or usual manner of operation.

(b) For each CEMS or CPMS, you must keep the records listed in paragraphs (b)(1) through (3) of this section.

(1) Records described in §63.10(b)(2)(vi) through (xi).

(2) Previous (i.e., superseded) versions of the performance evaluation plan as required in §63.8(d)(3).

(3) Requests for alternatives to the relative accuracy test for CEMS or CPMS as required in §63.8(f)(6)(i), if applicable.

(c) If you are operating a new or reconstructed stationary RICE which fires landfill gas or digester gas equivalent to 10 percent or more of the gross heat input on an annual basis, you must keep the records of your daily fuel usage monitors.

(d) You must keep the records required in Table 6 of this subpart to show continuous compliance with each emission or operating limitation that applies to you.

(e) You must keep records of the maintenance conducted on the stationary RICE in order to demonstrate that you operated and maintained the stationary RICE and after-treatment control device (if any) according to your own maintenance plan if you own or operate any of the following stationary RICE;

(1) An existing stationary RICE with a site rating of less than 100 brake HP located at a major source of HAP emissions.

(2) An existing stationary emergency RICE.

(3) An existing stationary RICE located at an area source of HAP emissions subject to management practices as shown in Table 2d to this subpart.

(f) If you own or operate any of the stationary RICE in paragraphs (f)(1) or (2) of this section, you must keep records of the hours of operation of the engine that is recorded through the non-resettable hour meter. The owner or operator must document how many hours are spent for emergency operation, including what classified the operation as emergency and how many hours are spent for non-emergency operation. If the engines are used for demand response operation, the owner or operator must keep records of the notification of the emergency situation, and the time the engine was operated as part of demand response.

(1) An existing emergency stationary RICE with a site rating of less than or equal to 500 brake HP located at a major source of HAP emissions that does not meet the standards applicable to non-emergency engines.

(2) An existing emergency stationary RICE located at an area source of HAP emissions that does not meet the standards applicable to non-emergency engines.

Permit Condition 62 includes the requirements of this section.

§ 63.6660 In what form and how long must I keep my records?

(a) Your records must be in a form suitable and readily available for expeditious review according to §63.10(b)(1).

(b) As specified in §63.10(b)(1), you must keep each record for 5 years following the date of each occurrence, measurement, maintenance, corrective action, report, or record.

(c) You must keep each record readily accessible in hard copy or electronic form for at least 5 years after the date of each occurrence, measurement, maintenance, corrective action, report, or record, according to §63.10(b)(1).

Permit Condition 62 includes the requirements of this section.

§ 63.6665 What parts of the General Provisions apply to me?

Table 8 to this subpart shows which parts of the General Provisions in §§63.1 through 63.15 apply to you. If you own or operate a new or reconstructed stationary RICE with a site rating of less than or equal to 500 brake HP located at a major source of HAP emissions (except new or reconstructed 4SLB engines greater than or equal to 250 and less than or equal to 500 brake HP), a new or reconstructed stationary RICE located at an area source of HAP emissions, or any of the following RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions, you do not need to comply with any of the requirements of the General Provisions specified in Table 8: An existing 2SLB stationary RICE, an existing 4SLB stationary RICE, an existing stationary RICE that combusts landfill or digester gas equivalent to 10 percent or more of the gross heat input on an annual basis, an existing emergency stationary RICE, or an existing limited use stationary RICE. If you own or operate any of the following RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions, you do not need to comply with the requirements in the General Provisions specified in Table 8 except for the initial notification requirements: A new stationary RICE that combusts landfill gas or digester gas equivalent to 10 percent or more of the gross heat input on an annual basis, a new emergency stationary RICE, or a new limited use stationary RICE.

Permit Condition 64 includes the requirements of this section.

Permit Conditions Review

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

Permit condition 1 establishes the permit to construct scope.

Permit condition 2 provides a description of the purpose of the permit and the regulated sources, the process, and the control devices used at the facility.

Permit condition 3 establishes that the permittee shall take all reasonable precautions, of which a partial list is provided, to prevent fugitive particulate matter (PM) from becoming airborne.

Permit condition 4 establishes that the permittee shall implement strategies to control fugitive dust emissions.

Permit condition 5 establishes collocation restrictions for the portable asphalt plant. The collocation restrictions are based upon parameters used during the ambient air quality modeling analysis.

Permit condition 6 establishes that the permittee notify DEQ when the permitted equipment is relocated. This requirement is based upon imposing reasonable permit conditions for portable asphalt plants.

Permit condition 7 establishes location restrictions in non-attainment areas for the portable asphalt plant. The location restrictions are based upon parameters used during the ambient air quality modeling analysis.

Permit condition 8 establishes that there are to be no emissions of odorous gases, liquids, or solids from the asphalt drum mixer and the load-out and silo filling operations into the atmosphere in such quantities that cause air pollution.

Permit condition 9 establishes that the permittee monitor fugitive dust emissions on a daily basis to demonstrate compliance with permit condition 3.

Permit condition 10 establishes that the permittee monitor and record the distances to equipment that will be collocated with the asphalt plant to demonstrate compliance with permit condition 5.

Permit condition 11 establishes that the permittee monitor and record odor complaints to demonstrate compliance with permit condition 8.

Permit Condition 12 establishes that the permittee shall maintain records as required by the Recordkeeping General Provision.

Permit condition 13 provides a process description of the asphalt production process at this facility.

Permit condition 14 provides a description of the control devices used on the asphalt production equipment at this facility.

Permit condition 15 establishes hourly and annual emissions limits for PM_{10}, SO_2, NO_X, CO, and VOC emissions from the asphalt production operation at this facility.

As discussed previously permit condition 16 incorporates the particulate matter and opacity standards of 40 CFR 60, Subpart I for Hot Mix Asphalt Plants.

As discussed previously, Permit Condition 17 establishes a 20% opacity limit for the asphalt drum mixer baghouse stack, the asphaltic oil tank heater stack, the load-out station, and silo filling slat conveyor stacks or functionally equivalent openings associated with the asphalt production operation.

Permit Condition 18 establishes an hourly, a daily, and an annual asphalt production limit for the asphalt production operation as proposed by the Applicant.

Permit Condition 19 establishes raw materials processing limitations for the asphalt production operation as proposed by the Applicant.

Permit condition 20 establishes set back distance restrictions for the asphalt production operation. The set back distance restrictions are based upon the results of the ambient air quality modeling analysis.

Permit Condition 21 establishes that a baghouse be used to control emissions from the asphalt drum mixer as proposed by the Applicant.

Permit Condition 22 establishes fuel use combustion restrictions for the asphalt drum mixer based upon 40 CFR 279.11. These fuel use restrictions were established because the Applicant requested the ability to combust used oil in the asphalt drum mixer.

Permit Condition 23 establishes fuel use combustion restrictions for the asphaltic oil tank heater. These fuel use restrictions were established because the Applicant requested the ability to combust natural gas, LPG/propane, and distillate fuel oil in the asphaltic oil tank heater.

Permit Condition 24 establishes PM_{10} performance testing requirements imposed by DEQ on asphalt plants located in the state of Idaho as well as the particulate matter performance testing requirements of 40 CFR 60, Subpart I for Hot Mix Asphalt Plants.

Permit Condition 25 establishes PM_{10} performance testing methods required by DEQ on asphalt plants located in the state of Idaho as well as the particulate matter performance testing methods of 40 CFR 60, Subpart I for Hot Mix Asphalt Plants.

Permit condition 26 establishes that the permittee monitor and record hourly and daily asphalt production to demonstrate compliance with the Asphalt Production Limits permit condition.

Permit condition 27 establishes that the permittee calculate and record RAP use to demonstrate compliance with the Allowable Raw Materials permit condition.

Permit condition 28 establishes that the permittee measure and record asphalt production equipment setback distances to demonstrate compliance with the Asphalt Operation Setback Distance Requirements permit condition.

Permit condition 29 establishes that the permittee shall establish procedures for operating the baghouse. This is a DEQ imposed standard requirement for operations using baghouses to control particulate emissions.

Permit condition 30 establishes that the permittee monitor distillate fuel oil shipments to demonstrate compliance with the distillate fuel oil requirements of the permit.

Permit condition 31 establishes that the permittee monitor biodiesel and biodiesel blends fuel shipments to demonstrate compliance with the biodiesel and biodiesel blends fuel requirements of the permit.

Permit condition 32 establishes that the permittee monitor used oil fuel shipments to demonstrate compliance with the used oil fuel requirements of the permit.

Permit condition 33 establishes that the permittee monitor asphalt production and visible emissions during the performance tests to establish the validity of the performance tests.

Permit Condition 34 establishes that the permittee shall maintain records as required by the Recordkeeping General Provision.

Permit Condition 35 establishes that the permittee shall submit the results of the performance tests to the appropriate DEQ office

Permit condition 36 establishes that the federal requirements of 40 CFR Part 60 are incorporated by reference into the requirements of this permit per current DEQ guidance.

Permit Condition 37 incorporates 40 CFR 60, Subpart A – General Provisions.

Permit condition 38 provides a process description of the IC engines process at this facility.

Permit condition 39 provides a description of the control devices used on the IC engines at this facility.

Permit condition 40 establishes hourly and annual emissions limits for PM_{10}, SO_2, NO_X, CO, and VOC emissions from the IC engines at this facility.

As discussed previously, Permit Condition 41 establishes a 20% opacity limit for the Primary IC Engine and the Backup IC Engine stacks or functionally equivalent openings associated with the asphalt production operation.

Permit Condition 42 establishes a daily and an annual operation limit for the Primary IC Engine as proposed by the Applicant.

Permit Condition 43 establishes a daily and an annual operation limit for the Backup IC Engine as proposed by the Applicant.

Permit Condition 44 establishes fuel use combustion restrictions for the Primary IC Engine and the Backup IC Engine. These fuel use restrictions were established because the Applicant requested the ability to combust ultra low sulfur distillate fuel oil in the Primary IC Engine and the Backup IC Engine.

As discussed previously, Permit Condition 45 establishes the initial compliance date for the Primary IC Engine and the Backup IC Engine as required by 40 CFR 63, ZZZZ for Stationary Reciprocating Internal Combustion Engines.

As discussed previously, Permit Condition 46 establishes startup requirements for the Primary IC Engine and the Backup IC Engine as required by 40 CFR 63, ZZZZ for Stationary Reciprocating Internal Combustion Engines.

As discussed previously, Permit Condition 47 establishes maintenance requirements for the Backup IC Engine as required by 40 CFR 63, ZZZZ for Stationary Reciprocating Internal Combustion Engines.

As discussed previously, Permit Condition 48 establishes CO emissions limits for the Primary IC Engine as required by 40 CFR 63, ZZZZ for Stationary Reciprocating Internal Combustion Engines.

As discussed previously, Permit Condition 49 establishes CO emissions measuring procedures for the Primary IC Engine as required by 40 CFR 63, ZZZZ for Stationary Reciprocating Internal Combustion Engines.

As discussed previously, Permit Condition 50 establishes formaldehyde or CO emissions measuring procedures for the Primary IC Engine as required by 40 CFR 63, ZZZZ for Stationary Reciprocating Internal Combustion Engines.

As discussed previously, Permit Condition 51 establishes performance testing requirements for the Primary IC Engine as required by 40 CFR 63, ZZZZ for Stationary Reciprocating Internal Combustion Engines.

As discussed previously, Permit Condition 52 establishes performance emissions reductions determination requirements for the Primary IC Engine as required by 40 CFR 63, ZZZZ for Stationary Reciprocating Internal Combustion Engines.

As discussed previously, Permit Condition 53 establishes performance tests administrator petition requirements for the Primary IC Engine as required by 40 CFR 63, ZZZZ for Stationary Reciprocating Internal Combustion Engines.

As discussed previously, Permit Condition 54 requires the installation of a Continuous Parameter Monitoring System (CPMS) for the Primary IC Engine as required by 40 CFR 63, ZZZZ for Stationary Reciprocating Internal Combustion Engines.

As discussed previously, Permit Condition 55 establishes operational requirements for the Backup IC Engine as required by 40 CFR 63, ZZZZ for Stationary Reciprocating Internal Combustion Engines.

As discussed previously, Permit Condition 56 requires the installation of a non-resettable hour meter for the Backup IC Engine as required by 40 CFR 63, ZZZZ for Stationary Reciprocating Internal Combustion Engines.

As discussed previously, Permit Condition 57 requires the installation of a closed crankcase ventilation system or open crankcase filtration emission control system for the Primary IC Engine as required by 40 CFR 63, ZZZZ for Stationary Reciprocating Internal Combustion Engines.

As discussed previously, Permit Condition 58 requires the installation of a temperature measurement device for the Primary IC Engine as required by 40 CFR 63, ZZZZ for Stationary Reciprocating Internal Combustion Engines.

As discussed previously, Permit Condition 59 establishes parameters for establishing the reduction in CO emissions when using oxidation catalyst and a CPMS for the Primary IC Engine as required by 40 CFR 63, ZZZZ for Stationary Reciprocating Internal Combustion Engines.

As discussed previously, Permit Condition 60 establishes notification requirements to EPA for the Primary IC Engine as required by 40 CFR 63, ZZZZ for Stationary Reciprocating Internal Combustion Engines.

As discussed previously, Permit Condition 61 establishes compliance reporting requirements for the Primary IC Engine as required by 40 CFR 63, ZZZZ for Stationary Reciprocating Internal Combustion Engines.

As discussed previously, Permit Condition 62 establishes recordkeeping requirements for the Primary IC Engine and the Backup IC Engine as required by 40 CFR 63, ZZZZ for Stationary Reciprocating Internal Combustion Engines.

Permit condition 63 establishes that the federal requirements of 40 CFR Part 63 are incorporated by reference into the requirements of this permit per current DEQ guidance.

Permit Condition 64 incorporates 40 CFR 60, Subpart A – General Provisions.

Permit condition 65 establishes that the permittee monitor and record daily operation of the Primary IC Engine to demonstrate compliance with the Primary IC Engine Operating Limits permit condition.

Permit condition 66 establishes that the permittee monitor and record daily operation of the Backup IC Engine to demonstrate compliance with the Backup IC Engine Operating Limits permit condition.

Permit condition 67 establishes that the permittee monitor distillate fuel oil shipments to demonstrate compliance with the distillate fuel oil requirements of the permit.

Permit Condition 68 establishes that the permittee shall maintain records as required by the Recordkeeping General Provision.

PUBLIC REVIEW

Public Comment Opportunity

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

APPENDIX A – EMISSIONS INVENTORIES

Hot Mix Asphalt PTC Toolkit

Version 07/08/2010

Information shown in bold/color on any worksheet indicates user input for that cell. Black text (normal or bold) is calculated or hard-wired -- do not type over formulas in these cells.

These worksheets were developed to expedite processing of PTC permits for Hot Mix Asphalt (HMA) facilities that are not co-located with any other emission sources.

User Input:

Facility Data-Model Input worksheet: Input facility-specific data including contact information, equipment ratings, HMA production levels, and tank heater and Engine hours of operation. Select fuel types and Engine options as noted below.

Short term source factor for carcinogens is set to "N", i.e., No. Do not change this to Y. Do not delete cells related to this--you will zero out carcinogenic emissions.

Using T-RACT for carcinogens is set to "N", i.e., No. Do not change this to Y. If appropriate, apply T-RACT factor of 10 to the carcinogenic ambient impact results from the modeling analysis.

Drum Mix HMA with Fabric Filter (Baghouse), either counterflow or parallel flow, fired by:

Distallate fuel oil. Default is 0.5% sulfur. User input required in "Facility Data Input" for any other sulfur content.
Used Oil/RFO4. Default is 0.5% sulfur. User input required in "Facility Data Input" for any other sulfur content.
Natural gas
LPG or propane
Facility Data Input: Input "1" (use this fuel) or "0" (don't use this fuel).
The EI summary sheets will use the highest emission for any selected fuel for each pollutant.

Asphalt Tank Heater, fired by #2 fuel oil or natural gas - operated 1/3 of the hours of the HMA

Facility Data Input: Input "1" (use this fuel) or "0" (don't use this fuel).
If line power is ALWAYS used, input "0" for each fuel.
Distallate fuel oil. Default is 0.5% sulfur. User input required in "Facility Data Input" for any other sulfur content.

Engines - operated up to 6000 hours per year

Facility Data Input: Input "1" (include Enginel) or "0" (omit Engine).
Distallate fuel oil. Default is 0.5% sulfur. User input required in "Facility Data Input" for any other sulfur content.
The EI will use Tier 2, 89.112 EFs for two engine size categories. E1 = Any combination of engines, all less than 175 hp, to a maximum of 175 bhp. E2 = Any combination of engines, all greater than 175 hp, to a maximum of 1350 hp.

Assumptions:

Emissions evaluation is based on IDAPA regulatory requirements current as of August 8, 2008
EFs are drawn from AP-42 factors available as of August 8, 2008.
Average brake-specific fuel consumption of 7000 Btu/hp-hr was assumed to convert from lb/MMBtu to lb/hp-hr.
Average diesel heating value is based on 19,300 Btu/lb with density equal 7.1 lb/gal.
AP-42 EFs for natural gas combustion (Tables 1.4-xx) are based on heat value of 1,020 Btu/scf.
Natural Gas Fuel Heating Value assumed to be 137,030 Btu/gal.
"Reasonable" AP-42 factors are used. Where factors were available in more than one AP-42 section, the estimates are based on the highest of the available factors. For example, AP-42 11.1 EFs for a tank heater burning #2 oil include no information for emissions of PM, NOx, SOx, VOCs, or lead, which is not reasonable. Criteria pollutant EFs from AP-42 1.3, Fuel Oil Combustion, are used instead, and are considered reasonable.

Fugitive Emissions: Fugitive PM emissions from storage piles are typically caused by front-end loader operations that transport the aggregate to the cold feed unit hoppers. Piles of RAP, because RAP is coated with asphalt cement, are not likely to cause significant fugitive dust problems. Aggregate moisture content prior to entry into the dryer is typically 3 percent to 7 percent. This moisture content, along with aggregate size classification, tend to minimize emissions from these sources, which contribute little to total facility PM emissions. PM10 emissions from these sources are reported to account for about 19 percent of their total PM emissions. *Source: STAPPA-ALAPCO-EPA, Preferred and Alternative Methods for Estimating Air Emissions from Hot-Mix Asphalt Plants, Final Report, July 1996. DEQ* CONCLUSION: Negligible fine PM emissions from RAP. Worst-case fugitive emissions from material handling are for 0% RAP.
Assume aggregate/RAP tons = 96% of total HMA tons.

Worksheet Tabs: Letter-Number reflect Location and Order in Statement of Basis

Facility Data Input (primary worksheet for **input** of facility-specific parameters)
EmissionInventory lb/hr - Drum dryer baghouse, tank heater, Engine, silo filling, and load-out
EmissionInventory TPY - Drum dryer baghouse, tank heater, Engine, silo filling, and load-out
Values in Emission Inventories reflect the maximums ONLY from fuel types selected.
FACWIDE TAPs EIs. Use for TAPs EL screening. Includes silo/loadout fugitives.
Lb/hr emissions shown are 24-hr averages for noncarcinogens and annual averages for carcinogens.

Worksheets for Emissions based on Source and Fuel Type:

Drum Dryer Used Oil FabricFilter	Drum Dryer, fired on used oil or RF04 oil
Drum Dryer #2 Oil FabricFilter	Drum Dryer, fired on #2 fuel oil
Drum Dryer NG Fabric Filter	Drum Dryer, natural gas fired
Drum Dryer LPG or Propane FabricFilter	Drum Dryer, LPG or propane-fired
Tank Heater #2 Oil AP-42 1.3, 11.1	Asphalt Tank Heater, fired on #2 fuel oil
Tank Heater NG-AP42 11.1	Asphalt Tank Heater, natural gas fired
Tank Heater NG-AP42 1.4	Asphalt Tank Heater, natural gas fired
Engine < 600 hp (447kW)	#2 Fuel oil fired
Engine > 600 hp (447kW)	#2 Fuel oil fired
Silo Fill Operations	Fugitive emissions based on HMA throughput
Load-out Operations	Fugitive emissions based on HMA throughput
Scalping Screen & Transfer Points (Front-end Loader and Conveyors) - Input wind speeds & moisture	

Criteria Pollutant Modeling	1-, 3-, 8-, 24-hour, and annual lb/hr emission rates
TAPs Modeling	24-hour, and annual lb/hr emission rates

CURRENT PTC APPLICATION ESTIMATES

DEQ Verification Worksheets: Hot Mix Asphalt (HMA) Drum Mix Facility Data

Facility ID/AIRS No.	**000-00000**	Spreadsheet Date	2/23/2011 9:36
Permit No.	**P-2010.Generic**	Spreadsheet Version	3/31/2010 klh

Facility Owner/Company Name:	**Aggregate Industries, SWR**
Address:	**3101 E Craig Road**
City, State, Zip:	**N Las Vegas, NV 89030**
Facility Contact:	**Mark Miller**
Contact Number/ e-mail:	**702.649.6250 / mark.miller@aggregate-us.com**

		Include Silo Fill & Loadout Emissions?	Y
Use Short Term Source Factor on 586 ELs? Y/N	N	**Use T-RACT on 586 AACC? Y/N**	N
Hot Mix Plant AP-42 Section 11.1	**Input (Bold Color) or Calculated Value (Black)**	**Fuel Type(s)**	**Fuel Type Toggle ("0" or "1")**
Drum Dryer Make/Model	**Gencor 400 HP2700**	Distillate (#2) Fuel Oil	**1**
Rated heat input capacity, MMBtu/hr	**135**	Used Oil or RFO4 Oil	**1**
Drum Dryer Hourly HMA Production, Tons/hour	**425**	Natural Gas	**0**
Max Production Per day, Tons per day	**3,800**	LPG or Propane	**0**
Max Annual HMA Production, Tons/year	**150,000**	Default #2 fuel oil and used oil sulfur	0.5%
Min Hours of operation per year (annual/max hourly productio	353	Distallate Fuel Oil Max Sulfur Content	**0.5000%**
		Used Oil/RFO4 Oil Max Sulfur Content	**0.5000%**

Ambient temperature limits HMA highway construction to 6000 hrs/year max - considered in modeling. EI based on max hourly and annual tons.
Ten years of NOAA data from Boise, Lewiston, and Pocatello: Lewiston most freeze days = 123; no freeze days = 242 (= 5808 hrs)

Asphalt Tank Heater AP-42, Section 11.1 (oil or natural gas fuel), or Section 1.4 (natural gas fuel) - EI based on max operational hrs/hr

Rated heat input capacity, MMBtu/hr	**2.000**	**Fuel Type(s)**	**Fuel Toggle**
Hours of operation per day	**16**	#2 Fuel Oil	**1**
Operation, days per year	125.00	Fuel oil sulfur content	**0.0015%**
Max Hours of operation per year	**2,000**	Natural Gas	**0**

To maintain tank temp, heat is reqd ~33% of 6000 hrs HMA operation/yr = 2000 hr/yr

Tank Heater Fuel Consumption	#2 Fuel Oil	Natural Gas
Heat Input Rating, MMBtu/hr	2.000	2.000
Fuel Heating Value, Btu/gal (oil) or Btu/scf (gas)	137,030	**1,020**
Heating Value Correction for Natural Gas EFs, see Note	n/a	1.000
Theoretical Max Fuel Use Rate gal/hr [oil] or scf/hr [gas]	14.60	1,961
Max Operational Hours per Year	2,000	2,000

Note: AP-42 EFs for natural gas and diesel combustion are based on heat value of 1,020 Btu/scf and 137,030 Btu/gal

E1 Engine < 175 bhp Tier 2, 89.112 emissions standards apply - EI based on max operational hrs/yr

		Fuel Type(s)	**Engine Toggle**
Engine Make/Model	**Small Diesel**	#2 Fuel Oil (Diesel)	**1**
Sum of Engine Maximum Rated Power (bhp)	**86**	Max Sulfur weight percent (w/o)	**0.0015%**
EF OPTIONS:		**Use EFs in lb/MMBtu fuel input**	
	0.7457	Max Operational Hours/Day	**12**
Avg brake-specific fuel consumption (BSFC) = 7000 Btu/hp-hr	7000	Max Operational Hours/Year	**2,000**
Fuel Heating Value, Btu/gal	137,030	Calculated Max Fuel Use Rate, gal/hr	4.39
	12	Calculated MMBtu/hr	0.60

E2 Engine >175 bhp T2, 89.112 emission standards apply - EI based on max operational hrs/yr

		Fuel Type(s)	**Engine Toggle**
Engine Make/Model	**Large Diesel**	#2 Fuel Oil (Diesel)	**1**
Sum of Engine Maximum Rated Power (bhp)	**1,000**	Max Sulfur weight percent (w/o)	**0.0015%**
EF OPTIONS:		**Use EFs in lb/MMBtu fuel input**	
	0.7457	Max Operational Hours per Day	**12**
Avg brake-specific fuel consumption (BSFC) = 7000 Btu/hp-hr	7000	Max Operational Hours per Year	**1,000**
Fuel Heating Value, Btu/gal	137,030	Calculated Max Fuel Use Rate, gal/hr	51.08
		Calculated MMBtu/hr	7.00

Note: AP-42 Tables 3.3-x,3.4-x: avg diesel heating value is based on 19,300 Btu/lb with density equal 7.1 lb/gal=> Btu/gal = 137,030

Aggregate Handling - Fugitive Emissions

U = mean wind speed (miles per hour)	**10**	
Moisture/Control % Considerations:		
AP-42 Table 11.19.2-2, Note b. Moisture content of uncontrolled sources ranged from 0.21 to 1.3%		
AP-42 Table 11.19.2-2, Note b. Moisture content of controlled (water spray) sources ranged from 0.55 to 2.88% -->		
~91.3% control for screening, ~95% control for conveyor transfer		
M = moisture content (%)	**3**	Bulk aggregate for HMAs typically stabilizes at 3 to 5% by weight.
If higher moisture is maintained, apply additional % control:	**10.00%**	For M=3% add 10% control. For M=5% add 15% control.
Number of front-end loader drop points (aggregate and RAP)	**2**	Drops to storage pile(s) and drop(s) to bins
Aggregate weigh conveyor transfer points	**2**	Transfer from bins to conveyor & from conveyor to scalping screen
Number of scalping screens, presumed to be	1	Includes all aggregate and RAP tonnage.
Aggregate conveyor transfer to drum	1	Includes all aggregate and RAP tonnage.

MPTE Pounds Per Hour

Pollutant	Gensets	DrumMixer	Heater	Asphalt Feed	Silo (Load/Unload)	Total
PM10	0.89	9.78	0.05	1.62	0.47	12.80
Nox	26.67	23.38	0.29	0.00	0.00	50.33
CO	6.07	55.25	0.07	0.00	1.07	62.47
VOC	0.91	13.60	0.01	0.00	1.71	16.23
SOx	0.19	24.65	0.00	0.00	0.00	24.84

MPTE Tons Per Year

Pollutant	Gensets	DrumMixer	Heater	Asphalt Feed	Silo (Load/Unload)	Total
PM10	0.54	1.73	0.05	0.29	0.08	2.69
Nox	14.67	4.13	0.29	0.00	0.00	19.08
CO	3.32	9.75	0.07	0.00	0.19	13.34
VOC	0.56	2.40	0.01	0.00	0.30	3.27
SOx	0.18	4.35	0.00	0.00	0.00	4.53

Facility:	**Aggregate Industries, SWR**			**EMISSION INVENTORY**
2/23/2011 9:36	**Permit/Facility ID:**	**P-2010.Generic**	**000-00000**	POUNDS PER HOUR — Page 1 of 2

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

A. Drum Mix Plant: **425** Tons/hour 500 Hours/year **150,000** Tons/year **3,800** Tons/day
Maximum emission for each pollutant from any fuel-burning options selected on "Facility Data" worksheet. Fuels Selected = #2 Fuel Oil Used Oil
B. Tank Heater: **2.0000** MMBtu/hr **2,000** Hours/year **16** hrs/day
Maximum emission for each pollutant for heater burning any fuel selected on "Facility Data" worksheet. Fuels Selected = ULSF #2 Fuel Oil
C1. Engine E1: **7.00** gal/hour **2000** Hours/year Engine < 600hp ULSF #2 Fuel Oil **12** hrs/day
C2. Engine E2: **62.00** gal/hour **1000** Hours/year Engine > 600hp ULSF #2 Fuel Oil **12** hrs/day

Pollutant	A Drum Mix Max Emission Rate for Pollutant (lb/hr)	B Asphalt Tank Heater Max Emission Rate for Pollutant (lb/hr)	C Engine E1 + E2 Max Emission Rate for Pollutant (lb/hr)	D Load-out & Silo Filling Emission Rate for Pollutant (lb/hr)	E TOTAL of Max Emission Rates from A, B, C & D (lb/hr)
PM (total)	14.03	4.82E-02	8.89E-01	4.71E-01	14.07
PM-10 (total)	9.78	4.82E-02	8.89E-01	4.71E-01	9.82
P.M.-2.5	0.00	0.00E+00	0.00E+00	0.00E+00	0.00
CO	55.25	7.30E-02	6.07E+00	1.07E+00	55.32
NOx	23.38	2.92E-01	2.67E+01		23.67
SO_2	24.65	3.11E-03	1.88E-01		24.65
VOC	13.60	8.12E-03	9.12E-01	1.71E+00	13.61
Lead	6.38E-03	2.20E-05	0.00E+00		6.40E-03
HCl [e]	8.93E-02	0.00E+00	0.00E+00		8.93E-02
Dioxins [e]					
2,3,7,8-TCDD	8.93E-11				**8.93E-11**
Total TCDD	3.95E-10				**3.95E-10**
1,2,3,7,8-PeCDD	1.32E-10				**1.32E-10**
Total PeCDD	9.35E-09				**9.35E-09**
1,2,3,4,7,8-HxCDD	1.79E-10	1.01E-11			**1.89E-10**
1,2,3,6,7,8-HxCDD	5.53E-10				**5.53E-10**
1,2,3,7,8,9-HxCDD	4.17E-10	1.11E-11			**4.28E-10**
Total HxCDD	5.10E-09				**5.10E-09**
1,2,3,4,6,7,8-Hp-CDD	2.04E-09	2.19E-10			**2.26E-09**
Total HpCDD	3.25E-10	2.92E-10			**6.17E-10**
Octa CDD	4.28E-10	5.33E-10			**9.61E-10**
Total PCDD [n]	1.35E-09	6.66E-10			**2.02E-09**
Furans [e]					
2,3,7,8-TCDF	1.66E-11				**1.66E-11**
Total TCDF	6.34E-11	1.10E-11			**7.44E-11**
1,2,3,7,8-PeCDF	7.36E-11				**7.36E-11**
2,3,4,7,8-PeCDF	1.44E-11				**1.44E-11**
Total PeCDF	1.44E-09	1.60E-12			**1.44E-09**
1,2,3,4,7,8-HxCDF	6.85E-11				**6.85E-11**
1,2,3,6,7,8-HxCDF	2.05E-11				**2.05E-11**
2,3,4,6,7,8-HxCDF	3.25E-11				**3.25E-11**
1,2,3,7,8,9-HxCDF	1.44E-10				**1.44E-10**
Total HxCDF	2.23E-10	6.66E-12			**2.29E-10**
1,2,3,4,6,7,8-HpCDF	1.11E-10				**1.11E-10**
1,2,3,4,7,8,9-HpCDF	4.62E-11				**4.62E-11**
Total HpCDF	1.71E-10	3.23E-11			**2.04E-10**
Octa CDF	8.22E-11	4.00E-11			**1.22E-10**
Total PCDF [n]	6.85E-10	1.03E-10			**7.88E-10**
Total PCDD/PCDF [n]	2.05E-09	7.66E-10	0.00E+00		**2.82E-09**
Non-PAH HAPs					
Acetaldehyde [e]	2.23E-02		1.26E-04		**2.24E-02**
Acrolein [e]	4.12E-03		2.78E-05		4.14E-03
Benzene [e]	6.68E-03	0.00E+00	7.48E-04	1.04E-04	**7.53E-03**
1,3-Butadiene [e]			5.37E-06		**5.37E-06**
Ethylbenzene [e]	3.80E-02			2.58E-03	4.06E-02
Formaldehyde [e]	5.31E-02	1.17E-05	2.25E-04	1.50E-03	**5.48E-02**
Hexane [e]	1.46E-01	0.00E+00		2.92E-03	1.49E-01
Isooctane	6.33E-03			1.78E-05	6.35E-03
Methyl Ethyl Ketone [e]	3.17E-03			1.08E-03	4.24E-03
Pentane [e]		0.00E+00			0.00E+00
Propionaldehyde [e]	2.06E-02				2.06E-02
Quinone [e]	2.53E-02				2.53E-02
Methyl chloroform [e]	7.60E-03				7.60E-03
Toluene [e]	4.59E-01	0.00E+00	1.11E-03	2.58E-03	4.63E-01
Xylene [e]	3.17E-02		7.61E-04	1.29E-02	4.54E-02
POM (7-PAH Group) [e]	9.38E-06	3.33E-07	4.07E-06	1.94E-05	**3.32E-05**
TOTAL PAH HAPs	1.52E-02	7.67E-05	1.92E-04	8.42E-04	**1.63E-02**

Pollutant	A Drum Mix Max Emission Rate for Pollutant (lb/hr)	B Asphalt Tank Heater Max Emission Rate for Pollutant (lb/hr)	C Engine E1 + E2 Max Emission Rate for Pollutant (lb/hr)	D Load-out & Silo Filling Emission Rate for Pollutant (lb/hr)	E TOTAL of Max Emission Rates from A, B, C & D (lb/hr)
PAH HAPs					
2-Methylnaphthalene	2.91E-03	0.00E+00		3.68E-04	**3.28E-03**
3-Methylchloranthrene [e]	0.00E+00	0.00E+00			**0.00E+00**
Acenaphthene	2.40E-05	1.77E-06	3.93E-06	3.56E-05	**6.53E-05**
Acenaphthylene	3.77E-04	6.66E-07	8.07E-06	2.24E-06	**3.88E-04**
Anthracene	5.31E-05	6.00E-07	1.24E-06	9.74E-06	**6.47E-05**
Benzo(a)anthracene [e]	3.60E-06	0.00E+00	7.28E-07	3.54E-06	**7.87E-06**
Benzo(a)pyrene [e]	1.68E-07	0.00E+00	2.31E-07	1.34E-07	**5.33E-07**
Benzo(b)fluoranthene [e]	1.71E-06	3.33E-07	9.01E-07	4.44E-07	**3.39E-06**
Benzo(e)pyrene	1.88E-06	0.00E+00		8.68E-07	**2.75E-06**
Benzo(g,h,i)perylene	6.85E-07	0.00E+00	5.12E-07	1.11E-07	**1.31E-06**
Benzo(k)fluoranthene [e]	7.02E-07	0.00E+00	1.96E-07	1.28E-07	**1.03E-06**
Chrysene [e]	3.08E-06	0.00E+00	1.27E-06	1.51E-05	**1.95E-05**
Dibenzo(a,h)anthracene [e]	0.00E+00	0.00E+00	3.57E-07	2.16E-08	**3.78E-07**
Dichlorobenzene	0.00E+00	0.00E+00			**0.00E+00**
Fluoranthene	1.04E-05	1.47E-07	4.27E-06	9.44E-06	**2.43E-05**
Fluorene	1.88E-04	1.07E-07	1.42E-05	8.89E-05	**2.92E-04**
Indeno(1,2,3-cd)pyrene [e]	1.20E-07	0.00E+00	3.82E-07	2.74E-08	**5.30E-07**
Naphthalene [e]	1.11E-02	5.66E-05	1.16E-04	1.52E-04	**1.15E-02**
Perylene	1.51E-07	0.00E+00		2.59E-06	**2.74E-06**
Phenanthrene	3.94E-04	1.63E-05	3.66E-05	1.26E-04	**5.72E-04**
Pyrene	5.14E-05	1.07E-07	3.62E-06	2.79E-05	**8.30E-05**
Non-HAP Organic Compounds					
Acetone [e]	1.31E-01	0.00E+00		1.37E-03	1.33E-01
Benzaldehyde	1.74E-02	0.00E+00			1.74E-02
Butane	1.06E-01	0.00E+00			1.06E-01
Butyraldehyde	2.53E-02	0.00E+00			2.53E-02
Crotonaldehyde [e]	1.36E-02	0.00E+00			1.36E-02
Ethylene	1.11E+00	0.00E+00		2.59E-02	1.13E+00
Heptane	1.49E+00	0.00E+00			1.49E+00
Hexanal	1.74E-02	0.00E+00			1.74E-02
Isovaleraldehyde	5.07E-03	0.00E+00			5.07E-03
2-Methyl-1-pentene	6.33E-01	0.00E+00			6.33E-01
2-Methyl-2-butene	9.18E-02	0.00E+00			9.18E-02
3-Methylpentane	3.01E-02	0.00E+00			3.01E-02
1-Pentene	3.48E-01	0.00E+00			3.48E-01
n-Pentane	3.33E-02	0.00E+00			3.33E-02
Valeraldehyde [e]	1.06E-02	0.00E+00			1.06E-02
Metals					
Antimony [e]	2.85E-05	5.11E-05			7.96E-05
Arsenic [e]	9.59E-06	4.40E-06			**1.40E-05**
Barium [e]	9.18E-04	2.50E-05			9.43E-04
Beryllium [e]	0.00E+00	9.26E-08			**9.26E-08**
Cadmium [e]	7.02E-06	1.33E-06			**8.35E-06**
Chromium [e]	8.71E-04	8.22E-06			8.79E-04
Cobalt [e]	4.12E-06	5.86E-05			6.27E-05
Copper [e]	4.91E-04	1.71E-05			5.08E-04
Hexavalent Chromium [e]	7.71E-06	8.26E-07			**8.53E-06**
Manganese [e]	1.22E-03	2.92E-05			1.25E-03
Mercury [e]	4.12E-04	1.10E-06			4.13E-04
Molybdenum [e]	0.00E+00	7.66E-06			7.66E-06
Nickel [e]	1.08E-03	2.82E-04			**1.36E-03**
Phosphorus [e]	4.43E-03	9.20E-05			4.53E-03
Silver [e]	7.60E-05	0.00E+00			7.60E-05
Selenium [e]	5.54E-05	6.65E-06			6.21E-05
Thallium [e]	6.49E-07	0.00E+00			6.49E-07
Vanadium [e]	0.00E+00	3.09E-04			3.09E-04
Zinc [e]	9.66E-03	2.83E-04			9.94E-03

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

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

A. Drum Mix Plant:	**425** Tons/hour	353 Hours/year	**150,000** Tons/year HMA throughput	**3,800** hrs/day
Maximum emission for each pollutant from any fuel-burning option selected. Fuels Selected =			#2 Fuel Oil Used Oil	
B. Tank Heater:	**2.0000** MMBtu/hr	**2,000** Hours/year		**16** hrs/day
Maximum emission for each pollutant from any fuel-burning option selected. Fuels Selected =			#2 Fuel Oil	
C1. Engine E1:	**7.00** gal/hour	**2000** Hours/year	#2 Fuel Oil Engine < 600hp	**12** hrs/day
C2. Engine E2:	**62.00** gal/hour	**1000** Hours/year	#2 Fuel Oil Engine > 600hp	**12** hrs/day

Pollutant	A **Drum Mix** Max Emission Rate for Pollutant (lb/hr)	B **Asphalt Tank Heater** Max Emission Rate for Pollutant (lb/hr)	C **Engine Max Emission Rate for Pollutant (lb/hr)**	D **Load-out & Silo Filling** Emission Rate for Pollutant (lb/hr)	E **TOTAL** of Max Emission Rates from A, B, C & D (lb/hr)
non-PAH HAPs[a]					
Bromomethane[e]				1.58E-04	1.58E-04
2-Butanone (see Methyl Ethyl Ketone)					
Carbon disulfide[e]				3.94E-04	3.94E-04
Chloroethane (Ethyl chloride[e])				7.86E-05	7.86E-05
Chloromethane (Methyl chloride[e])				5.43E-04	5.43E-04
Cumene				7.24E-04	7.24E-04
n-Hexane					
Methylene chloride (Dichloromethane[e])				5.21E-06	5.21E-06
MTBE					
Styrene[e]				1.52E-04	1.52E-04
Tetrachloroethene (Tetrachloroethylene[e])				5.07E-05	5.07E-05
1,1,1-Trichloroethane (Methyl chloroform[e])					
Trichloroethene (Trichloroethylene[e])					
Trichlorofluoromethane				8.56E-06	8.56E-06
m-/p-Xylene[e]				6.56E-03	6.56E-03
o-Xylene[e]				6.37E-03	6.37E-03
Phenol[e,i]				6.37E-04	6.37E-04
Non-HAP Organic Compounds					
Methane				5.44E-01	5.44E-01

e) IDAPA Toxic Air Pollutant

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: Aggregate Industries, SWR

2/23/2011 9:36 Permit/Facility ID: P-2010.Generic 000-00000

EMISSION INVENTORY
TONS PER YEAR

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

A. Drum Mix Plant: 425 Tons/hour 353 Hours/year 150,000 Tons/year HMA throughput 3,800 hrs/day
Maximum emission for each pollutant from any fuel-burning options selected on "Facility Data" worksheet. Fuels Selected = #2 Fuel Oil Used Oil
B. Tank Heater: 2.0000 MMBtu/hr 2,000 Hours/year 16 hrs/day
Maximum emission for each pollutant for heater burning any fuel selected on "Facility Data" worksheet. Fuels Sele ULSF #2 Fuel Oil
C1. Engine E1: 4.39 gal/hour 2000 Hours/year Engine <600hp ULSF #2 Fuel Oil 12 hrs/day
C2. Engine E2: 51.08 gal/hour 1000 Hours/year Engine > 600hp ULSF #2 Fuel Oil 12 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 Engine E1 + E2 Max Emission Rate for Pollutant (T/yr)	D Load-out & Silo Filling, Emission Rate for Pollutant (T/yr)	E TOTAL of Max Emission Rates from A, B, & C (T/yr) Exclude Fugitives from D
PM (total)	2.48	4.82E-02	5.39E-01	8.31E-02	3.06
PM-10 (total)	1.73	4.82E-02	5.39E-01	8.31E-02	2.31
P.M.-2.5					
CO	9.75	7.30E-02	3.32E+00	1.90E-01	13.15
NOx	4.13	2.92E-01	1.47E+01		19.08
SO_2	4.35	3.109E-03	1.82E-01		4.54
VOC	2.40	8.12E-03	5.62E-01	3.02E-01	2.97
Lead	1.13E-03	2.20E-05	0.00E+00		1.15E-03
HCl [e]	1.58E-02	0.00E+00	0.00E+00		1.58E-02
Dioxins[e]					
2,3,7,8-TCDD	1.58E-11				1.58E-11
Total TCDD	6.98E-11				6.98E-11
1,2,3,7,8-PeCDD	2.33E-11				2.33E-11
Total PeCDD	1.65E-09				1.65E-09
1,2,3,4,7,8-HxCDD	3.15E-11	1.01E-11			4.16E-11
1,2,3,6,7,8-HxCDD	9.75E-11				9.75E-11
1,2,3,7,8,9-HxCDD	7.35E-11	1.11E-11			8.46E-11
Total HxCDD	9.00E-10				9.00E-10
1,2,3,4,6,7,8-Hp-CDD	3.60E-10	2.19E-10			5.79E-10
Total HpCDD	1.43E-09	2.92E-10			1.72E-09
Octa CDD	1.88E-09	2.34E-09			4.21E-09
Total PCDD[h]	5.93E-09	2.92E-09			8.84E-09
Furans[e]					
2,3,7,8-TCDF	7.28E-11				7.28E-11
Total TCDF	2.78E-10	4.82E-11			3.26E-10
1,2,3,7,8-PeCDF	3.23E-10				3.23E-10
2,3,4,7,8-PeCDF	6.30E-11				6.30E-11
Total PeCDF	6.30E-09	7.01E-12			6.31E-09
1,2,3,4,7,8-HxCDF	3.00E-10				3.00E-10
1,2,3,6,7,8-HxCDF	9.00E-11				9.00E-11
2,3,4,6,7,8-HxCDF	1.43E-10				1.43E-10
1,2,3,7,8,9-HxCDF	6.30E-10				6.30E-10
Total HxCDF	9.75E-10	2.92E-11			1.00E-09
1,2,3,4,6,7,8-HpCDF	4.88E-10				4.88E-10
1,2,3,4,7,8,9-HpCDF	2.03E-10				2.03E-10
Total HpCDF	7.50E-10	1.42E-10			8.92E-10
Octa CDF	3.60E-10	1.75E-10			5.35E-10
Total PCDF[h]	3.00E-09	4.52E-10			3.45E-09
Total PCDD/PCDF[h]	9.00E-09	3.36E-09			1.24E-08
Non-PAH HAPs					
Acetaldehyde[e]	9.75E-02		5.50E-04		9.80E-02
Acrolein[e]	1.95E-03		8.33E-05		2.03E-03
Benzene[e]	2.93E-02	0.00E+00	3.28E-03	4.55E-04	3.25E-02
1,3-Butadiene[e]	0.00E+00		2.35E-05		2.35E-05
Ethylbenzene[e]	1.80E-02			1.22E-03	1.80E-02
Formaldehyde[e]	2.33E-01	5.11E-05	9.87E-04	6.58E-03	2.34E-01
Hexane[e]	6.90E-02	0.00E+00		1.38E-03	6.90E-02
Isooctane	3.00E-03			8.45E-06	3.00E-03
Methyl Ethyl Ketone[e]	1.50E-03			5.09E-04	1.50E-03
Pentane[e]	0.00E+00	0.00E+00			0.00E+00
Propionaldehyde[e]	9.75E-03				9.75E-03
Quinone[e]	1.20E-02				1.20E-02
Methyl chloroform[e]	3.60E-03				3.60E-03
Toluene[e]	2.18E-01	0.00E+00	1.23E-03	1.22E-03	2.19E-01
Xylene[e]	1.50E-02	0.00E+00	8.47E-04	6.12E-03	1.58E-02
TOTAL Federal HAPs (T/yr)=					**8.17E-01**

Pollutant	A Drum Mix Max Emission Rate for Pollutant (T/yr)	B Asphalt Tank Heater Max Emission Rate for Pollutant (T/yr)	C Engine E1 + E2 Max Emission Rate for Pollutant (T/yr)	D Load-out & Silo Filling Emission Rate for Pollutant (T/yr)	E TOTAL of Max Emission Rates from A, B, & C (T/yr) Exclude Fugitives from D
PAH HAPs					
2-Methylnaphthalene	1.28E-02	0.00E+00		1.61E-03	1.28E-02
3-Methylchloranthrene[e]	0.00E+00	0.00E+00			0.00E+00
Acenaphthene	1.05E-04	7.74E-06	1.72E-05	1.56E-04	1.30E-04
Acenaphthylene	1.65E-03	2.92E-06	3.54E-05	9.83E-06	1.69E-03
Anthracene	2.33E-04	2.63E-06	5.43E-06	4.27E-05	2.41E-04
Benzo(a)anthracene[e]	1.58E-05	0.00E+00	3.19E-06	1.55E-05	1.89E-05
Benzo(a)pyrene[e]	7.35E-07	0.00E+00	1.01E-06	5.88E-07	1.75E-06
Benzo(b)fluoranthene[e]	7.50E-06	1.46E-06	3.94E-06	1.94E-06	1.29E-05
Benzo(e)pyrene	8.25E-06	0.00E+00		3.80E-06	8.25E-06
Benzo(g,h,i)perylene	3.00E-06	0.00E+00	2.24E-06	4.86E-07	5.24E-06
Benzo(k)fluoranthene[e]	3.08E-06	0.00E+00	8.56E-07	5.63E-07	3.93E-06
Chrysene[e]	1.35E-05	0.00E+00	5.57E-06	6.63E-05	1.91E-05
Dibenzo(a,h)anthracene	0.00E+00	0.00E+00	1.56E-06	9.46E-08	1.56E-06
Dichlorobenzene	0.00E+00	0.00E+00			0.00E+00
Fluoranthene	4.58E-05	6.42E-07	1.87E-05	4.13E-05	6.51E-05
Fluorene	8.25E-04	4.67E-07	6.24E-05	3.89E-04	8.88E-04
Indeno(1,2,3-cd)pyrene[e]	5.25E-07	0.00E+00	1.67E-06	1.20E-07	2.20E-06
Naphthalene[e]	4.88E-02	2.48E-04	5.06E-04	6.66E-04	4.95E-02
Perylene	6.60E-07	0.00E+00		1.13E-05	6.60E-07
Phenanthrene	1.73E-03	7.15E-05	1.60E-04	5.50E-04	1.96E-03
Pyrene	2.25E-04	4.67E-07	1.59E-05	1.22E-04	2.41E-04
Non-HAP Organic Compounds					
Acetone[e]	6.23E-02	0.00E+00		6.49E-04	6.23E-02
Benzaldehyde	8.25E-03	0.00E+00			8.25E-03
Butane	5.03E-02	0.00E+00			5.03E-02
Butyraldehyde	1.20E-02	0.00E+00			1.20E-02
Crotonaldehyde[e]	6.45E-03	0.00E+00			6.45E-03
Ethylene	5.25E-01	0.00E+00		1.23E-02	5.25E-01
Heptane	7.05E-01	0.00E+00			7.05E-01
Hexanal	8.25E-03	0.00E+00			8.25E-03
Isovaleraldehyde	2.40E-03	0.00E+00			2.40E-03
2-Methyl-1-pentene	3.00E-01	0.00E+00			3.00E-01
2-Methyl-2-butene	4.35E-02	0.00E+00			4.35E-02
3-Methylpentane	1.43E-02	0.00E+00			1.43E-02
1-Pentene	1.65E-01	0.00E+00			1.65E-01
n-Pentane[e]	1.58E-02	0.00E+00			1.58E-02
Valeraldehyde[e]	5.03E-03	0.00E+00			5.03E-03
Metals					
Antimony[e]	1.35E-05	7.66E-05			9.01E-05
Arsenic[e]	4.20E-05	1.93E-05			6.13E-05
Barium[e]	4.35E-04	3.75E-05			4.73E-04
Beryllium[e]	0.00E+00	4.06E-07			4.06E-07
Cadmium[e]	3.08E-05	5.81E-06			3.66E-05
Chromium[e]	4.13E-04	1.23E-05			4.25E-04
Cobalt[e]	1.95E-06	8.79E-05			8.98E-05
Copper[e]	2.33E-04	2.57E-05			2.58E-04
Hexavalent Chromium[e]	3.38E-05	3.62E-06			3.74E-05
Manganese[e]	5.78E-04	4.38E-05			6.21E-04
Mercury[e]	1.95E-04	1.65E-06			1.97E-04
Molybdenum[e]	0.00E+00	1.15E-05			1.15E-05
Nickel[e]	4.73E-03	1.23E-03			5.96E-03
Phosphorus[e]	2.10E-03	1.38E-04			2.24E-03
Silver[e]	3.60E-05	0.00E+00			3.60E-05
Selenium[e]	2.63E-05	9.97E-06			3.62E-05
Thallium[e]	3.08E-07				3.08E-07
Vanadium[e]	0.00E+00	4.64E-04			4.64E-04
Zinc[e]	4.58E-03	4.25E-04			5.00E-03

e) IDAPA Toxic Air Pollutant

Facility: Aggregate Industries, SWR

2/23/2011 9:36 Permit/Facility ID: P-2010.Gen 000-00000

EMISSION INVENTORY
TONS PER YEAR

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

A. Drum Mix Plant: 425 Tons/hour 353 Hours/year 150,000 Tons/year 3,800 Tons/day
Maximum emission for each pollutant from any fuel-burning option selected. Fuels Selected = #2 Fuel Oil Used Oil
B. Tank Heater: 2.0000 MMBtu/hr 2,000 Hours/year 16 hrs/day
Maximum emission for each pollutant from any fuel-burning option selected. Fuels Selected = #2 Fuel Oil
C1. Engine E1: 4.39 gal/hour 2000 Hours/year #2 Fuel Oil Engine <600hp 12 hrs/day
C2. Engine E2: 51.08 gal/hour 1000 Hours/year #2 Fuel Oil Engine > 600hp 12 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 Engine Max Emission Rate for Pollutant (T/yr)	D Load-out, Silo Filling, & Tank Storage Emission Rate for Pollutant (T/yr)	E TOTAL of Max Emission Rates from A, B, & C (T/yr) Exclude Fugitives from D
non-PAH HAPs[e]					
Bromomethane[e]				7.47E-05	0.00E+00
2-Butanone (see Methyl Ethyl Ketone)					0.00E+00
Carbon disulfide[e]				1.87E-04	0.00E+00
Chloroethane (Ethyl chloride[e])				3.72E-05	0.00E+00
Chloromethane (Methyl chloride[e])				2.57E-04	0.00E+00
Cumene				3.43E-04	0.00E+00
n-Hexane				0.00E+00	0.00E+00
Methylene chloride (Dichloromethane[e])				2.47E-06	0.00E+00
MTBE					0.00E+00
Styrene[e]				7.21E-05	0.00E+00
Tetrachloroethene (Tetrachloroethylene[e])				2.40E-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				4.05E-06	0.00E+00
m-/p-Xylene[e]				3.11E-03	0.00E+00
o-Xylene[e]				3.02E-03	0.00E+00
Phenol[e,f]				3.02E-04	0.00E+00
Non-HAP Organic Compounds					
Methane				2.58E-01	0.00E+00

e) IDAPA Toxic Air Pollutant

Facility: Aggregate Industries, SWR
2/23/2011 9:36 Permit/Facility ID: P-2010.Generic 000-00000

EP8 Engine <175 bhp

Olympia 60KW Genset w/ Cat 6260 Engine

Fuel Type Toggle =	1	86 bhp
Fuel Consumption Rate	4.39 gal/hr	
Calculated MMBtu/hr	0.6020 MMBtu/hr	
Max Daily Operation	12 hr/day	
Max Annual Operation	2,000 hrs/yr	

AP-42 3.3-1 SO2 EF = 0.29 for #2 fuel oil, presumed max 0.5%
SO2 emissions are multiplied by a factor: User Input Value/0.5% = 0.0030
User Input Weight % Sulfur = 0.0015%

This genset is manufactured in 1995. AP42 Emision Factors used.

VOC	0.0025	lbs/hp-hr
SOx	0.0021	lbs/hp-hr
PM10	0.0022	lbs/hp-hr
CO	0.0067	lbs/hp-hr
Nox	0.0310	lbs/hp-hr

Pollutant	Emission Factor[a] (lb/hp-hr)	Emissions (lb/hr)	Emissions (T/yr)	TAPs Emissions (lb/hr) Annual or 24-hr Average
PM (total) [b]	0.0022	0.189	0.19	4.32E-02
PM-10 (total) [b]	0.0022	0.189	0.19	4.32E-02
P.M.-2.5				0.00E+00
CO [b]	0.0067	0.574	0.57	1.31E-01
NOx[b]	0.0310	2.666	2.67	6.09E-01
SO_2 [b] (total SOx presumed SO2)	2.050E-03	0.176	0.18	4.03E-02
VOC [b] (total TOC--> VOCs)	0.0025	0.212	0.21	4.85E-02
Lead				
HCl [e]				
Dioxins[e]				
2,3,7,8-TCDD	**AP42 3.3-1 Emission Factors (lbs/hp-hr**			
Total TCDD	**PM/PM10**	**0.0022**		
1,2,3,7,8-PeCDD	**CO**	**0.0067**		
Total PeCDD	**Nox**	**0.0310**		
1,2,3,4,7,8-HxCDD[c]	**VOC**	**0.0025**		
1,2,3,6,7,8-HxCDD	**SOx**	**0.0021**		
1,2,3,7,8,9-HxCDD[c]	**1 lb =**	**453.5924**	**g**	
Total HxCDD				
1,2,3,4,6,7,8-Hp-CDD[c]				
Total HpCDD[c]				
Octa CDD[c]				
Total PCDD[c]				
Furans[e]				
2,3,7,8-TCDF				
Total TCDF[c]				
1,2,3,7,8-PeCDF				
2,3,4,7,8-PeCDF				
Total PeCDF[c]				
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[c]				
1,2,3,4,6,7,8-HpCDF				
1,2,3,4,7,8,9-HpCDF				
Total HpCDF[c]				
Octa CDF[c]				
Total PCDF[c]				
Total PCDD/PCDF[c]				
Non-PAH HAPs				
Acetaldehyde[c]	7.67E-04	4.62E-04	4.62E-04	**1.05E-04**
Acrolein[c]	9.25E-05	5.57E-05	5.57E-05	2.78E-05
Benzene[c,e]	9.33E-04	5.62E-04	5.62E-04	**1.28E-04**
1,3-Butadiene[c,e]	3.91E-05	2.35E-05	2.35E-05	**5.37E-06**
Ethylbenzene[e]				
Formaldehyde[c,e]	1.18E-03	7.10E-04	7.10E-04	**1.62E-04**
Hexane[e]				
Isooctane				
Methyl Ethyl Ketone[e]				
Pentane[e]				
Propionaldehyde[e]				
Quinone[e]				
Methyl chloroform[e]				
Toluene[c,e]	4.09E-04	2.46E-04	2.46E-04	1.23E-04
Xylene[c,e]	2.85E-04	1.72E-04	1.72E-04	8.58E-05
PAH, Total		1.01E-04		**2.31E-05**
POM (7-PAH Group)		2.07E-06		**4.72E-07**

Pollutant	Emission Factor[a] (lb/MMBtu)	Emissions (lb/hr)	Emissions (T/yr)	TAPs Emissions (lb/hr) Annual or 24-hr Average
PAH HAPs				
2-Methylnaphthalene				
3-Methylchloranthrene[e]				
Acenaphthene[c]	1.42E-06	8.55E-07	8.55E-07	**1.95E-07**
Acenaphthylene[c]	5.06E-06	3.05E-06	3.05E-06	**6.95E-07**
Anthracene[c]	1.87E-06	1.13E-06	1.13E-06	**2.57E-07**
Benzo(a)anthracene[c]	1.68E-06	1.01E-06	1.01E-06	**2.31E-07**
Benzo(a)pyrene[c,e]	1.88E-07	1.13E-07	1.13E-07	**2.58E-08**
Benzo(b)fluoranthene[c]	9.91E-08	5.97E-08	5.97E-08	**1.36E-08**
Benzo(e)pyrene				
Benzo(g,h,i)perylene[c]	4.89E-07	2.94E-07	2.94E-07	**6.72E-08**
Benzo(k)fluoranthene[c]	1.55E-07	9.33E-08	9.33E-08	**2.13E-08**
Chrysene[c]	3.53E-07	2.13E-07	2.13E-07	**4.85E-08**
Dibenzo(a,h)anthracene[c]	5.83E-07	3.51E-07	3.51E-07	**8.01E-08**
Dichlorobenzene				
Fluoranthene[c]	7.61E-06	4.58E-06	4.58E-06	**1.05E-06**
Fluorene[c]	2.92E-05	1.76E-05	1.76E-05	**4.01E-06**
Indeno(1,2,3-cd)pyrene[c]	3.75E-07	2.26E-07	2.26E-07	**5.15E-08**
Naphthalene[c,e]	8.48E-05	5.10E-05	5.10E-05	**1.17E-05**
Perylene				
Phenanthrene[c]	2.94E-05	1.77E-05	1.77E-05	**4.04E-06**
Pyrene[c]	4.78E-06	2.88E-06	2.88E-06	**6.57E-07**
Non-HAP Organic Compounds				
Acetone[e]				
Benzaldehyde				
Butane				
Butyraldehyde				
Crotonaldehyde[e]				
Ethylene				
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
b) AP-42, Table 3.3-1, Emission Factors for Uncontrolled Gasoline and Diesel Industrial Engines, 10/96
c) AP-42, Table 3.3-2, Speciated Organic Compoun Emission Factors for Uncontrolled Diesel Engine, Emission Factor Rating E, 10/96
d) (reserved)
e) IDAPA Toxic Air Pollutant

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: Aggregate Industries, SWR
2/23/2011 9:36 Permit/Facility ID: P-2010.Gen(000-00000

EP6 Engine > 175 bhp

Fuel Type Toggle =	1	1,000 bhp Engine	
Fuel Consumption Rate	51.08 gal/hr		
Calculated MMBtu/hr	7.0000 MMBtu/hr		
Max Daily Operation	12 hr/day		
Max Annual Operation	1,000 hrs/yr		

User Input Weight % Sulfur = 0.0015% AP-42 3.4-1 SO2 EF = .00809 x S (.0015)

Engine is Non Quad IIII. DOM is 1980. AP42 3.4-1 Factors are used.	
PM10	0.0007 lbs/hp-hr
Nox	0.024 lbs/hp-hr
CO	0.0055 lbs/hp-hr
VOC	0.0007 lbs/hp-hr
SOx	0.000012 lbs/hp-hr

Pollutant	Emission Factor[a] (lb/HP)	Emissions (lb/hr)	Emissions (T/yr)	TAPs Emissions (lb/hr) Annual or 24-hr Average
PM [b]	0.0007	0.700	0.35	7.99E-02
PM-10 (total) [d]	0.0007	0.700	0.35	7.99E-02
P.M.-2.5				0.00E+00
CO [b]	0.0055	5.500	2.75	6.28E-01
NOx[b]	0.024	24.000	12.00	2.74E+00
SO_2 [b] (total SOx presumed SO2)	1.200E-05	0.012	0.01	1.37E-03
VOC [b] (total TOC--> VOCs)	0.0007	0.700	0.35	7.99E-02
Lead				
HCl [e]				
Dioxins[e]	AP42 3.4-1 factors see above			
2,3,7,8-TCDD				
Total TCDD				
1,2,3,7,8-PeCDD				
Total PeCDD				
1,2,3,4,7,8-HxCDD[c]				
1,2,3,6,7,8-HxCDD				
1,2,3,7,8,9-HxCDD[c]				
Total HxCDD	1 lb =	453.5924	g	
1,2,3,4,6,7,8-Hp-CDD[c]				
Total HpCDD[c]				
Octa CDD[c]				
Total PCDD[c]				
Furans[e]				
2,3,7,8-TCDF				
Total TCDF[c]				
1,2,3,7,8-PeCDF				
2,3,4,7,8-PeCDF				
Total PeCDF[c]				
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[c]				
1,2,3,4,6,7,8-HpCDF				
1,2,3,4,7,8,9-HpCDF				
Total HpCDF[c]				
Octa CDF[c]				
Total PCDF[c]				
Total PCDD/PCDF[c]				
Non-PAH HAPs				
Acetaldehyde[c]	2.52E-05	1.76E-04	8.82E-05	**2.01E-05**
Acrolein[c]	7.88E-06	5.52E-05	2.76E-05	
Benzene[c,e]	7.76E-04	5.43E-03	2.72E-03	**6.20E-04**
1,3-Butadiene[c,e]				
Ethylbenzene[e]				
Formaldehyde[c,e]	7.89E-05	5.52E-04	2.76E-04	**6.30E-05**
Hexane[e]				
Isooctane				
Methyl Ethyl Ketone[e]				
Pentane[e]				
Propionaldehyde[e]				
Quinone[e]				
Methyl chloroform[e]				
Toluene[c,e]	2.81E-04	0.002	9.84E-04	9.84E-04
Xylene[c,e]	1.93E-04	0.001	6.76E-04	6.76E-04
PAH, Total		1.48E-03		**1.69E-04**
POM (7-PAH Group)		3.15E-05		**3.59E-06**

Pollutant	Emission Factor[a] (lb/MMBtu)	Emissions (lb/hr)	Emissions (T/yr)	TAPs Emissions (lb/hr) Annual or 24-hr Average
PAH HAPs				
2-Methylnaphthalene				
3-Methylchloranthrene[e]				
Acenaphthene[c1]	4.68E-06	3.28E-05	1.64E-05	**3.74E-06**
Acenaphthylene[c1]	9.23E-06	6.46E-05	3.23E-05	**7.38E-06**
Anthracene[c1]	1.23E-06	8.61E-06	4.31E-06	**9.83E-07**
Benzo(a)anthracene[c1]	6.22E-07	4.35E-06	2.18E-06	**4.97E-07**
Benzo(a)pyrene[c1,e]	2.57E-07	1.80E-06	9.00E-07	**2.05E-07**
Benzo(b)fluoranthene[c1]	1.11E-06	7.77E-06	3.89E-06	**8.87E-07**
Benzo(e)pyrene				
Benzo(g,h,i)perylene[c1]	5.56E-07	3.89E-06	1.95E-06	**4.44E-07**
Benzo(k)fluoranthene[c1]	2.18E-07	1.53E-06	7.63E-07	**1.74E-07**
Chrysene[c1]	1.53E-06	1.07E-05	5.36E-06	**1.22E-06**
Dibenzo(a,h)anthracene[c1]	3.46E-07	2.42E-06	1.21E-06	**2.76E-07**
Dichlorobenzene				
Fluoranthene[c1]	4.03E-06	2.82E-05	1.41E-05	**3.22E-06**
Fluorene[c1]	1.28E-05	8.96E-05	4.48E-05	**1.02E-05**
Indeno(1,2,3-cd)pyrene[c1]	4.14E-07	2.90E-06	1.45E-06	**3.31E-07**
Naphthalene[c1,e]	1.30E-04	9.10E-04	4.55E-04	**1.04E-04**
Perylene				
Phenanthrene[c1]	4.08E-05	2.86E-04	1.43E-04	**3.26E-05**
Pyrene[c1]	3.71E-06	2.60E-05	1.30E-05	**2.96E-06**
Non-HAP Organic Compounds				
Acetone[e]				
Benzaldehyde				
Butane				
Butyraldehyde				
Crotonaldehyde[e]				
Ethylene				
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
b) AP-42, Table 3.4-1, Gaseous Emission Factors for Large Stationary Diesel and All Stationary Dual Fuel Engines, 10/96
c) AP-42, Table 3.4-3, Speciated Organic Compound Emission Factors for Large Uncontrolled Stationary Diesel Engines, Emission Factor Rating E, 10/96
c1) AP-42, Table 3.4-4, PAH Emission Factors for Large Uncontrolled Stationary Diesel Engines, Emission Factor Rating E, 10/96
d) AP-42, Table 3.4-2, Particulate and Particle-Sizing Emission Factors for Large Uncontrolled Stationary Diesel Engines, Emission Factor Rating E, 10/96
e) IDAPA Toxic Air Pollutant

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: Aggregate Industries, SWR

2/23/2011 9:36 Permit/Facility ID: P-2010.Ger 000-00000

TAPs EL Screen - ALL SOURCES
586 pollutants are shown in bold — Page 1 of 2

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

A. Drum Mix Plant: 425 Tons/hour 353 Hours/year 150,000 Tons/year 3,800 Tons/day

Maximum emission for each pollutant from any fuel-burning option selected on "Facility Data" worksheet

B. Tank Heater: 2.0000 MMBtu Rated 2,000 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

Pollutant	TOTAL of Max Emission Rates from A, B, C & D (lb/hr)	TAPs Screening Emission Limit (EL) Increment[b] (lb/hr)	TAPs Emissions Exceed EL Increment?	Modeled? Meets AAC or AACC?
HCl[e]	0.089	0.05	Exceeds	
Dioxins[e]		Toxic Equivalency Factor[c]	Adjusted Emission Rate (lb/hr)	
2,3,7,8-TCDD	8.93E-11	1.0	8.93E-11	
Total TCDD	3.95E-10	n/a		
1,2,3,7,8-PeCDD	1.32E-10	0.5	6.59E-11	
Total PeCDD	9.35E-09	n/a		
1,2,3,4,7,8-HxCDD	1.89E-10	0.1	1.89E-11	
1,2,3,6,7,8-HxCDD	5.53E-10	0.1	5.53E-11	
1,2,3,7,8,9-HxCDD	4.28E-10	0.1	4.28E-11	
Total HxCDD	5.10E-09	n/a		
1,2,3,4,6,7,8-Hp-CDD	2.26E-09	0.01	2.26E-11	
Total HpCDD	6.17E-10	n/a		
Octa CDD	9.61E-10	0.0001	9.61E-14	
Total PCDD[h]	2.02E-09	n/a		
Furans[e]				
2,3,7,8-TCDF	1.66E-11	0.1	1.66E-12	
Total TCDF	7.44E-11	n/a		
1,2,3,7,8-PeCDF	7.36E-11	0.05	3.68E-12	
2,3,4,7,8-PeCDF	1.44E-11	0.5	7.19E-12	
Total PeCDF	1.44E-09	n/a		
1,2,3,4,7,8-HxCDF	6.85E-11	0.1	6.85E-12	
1,2,3,6,7,8-HxCDF	2.05E-11	0.1	2.05E-12	
2,3,4,6,7,8-HxCDF	3.25E-11	0.1	3.25E-12	
1,2,3,7,8,9-HxCDF	1.44E-10	0.1	1.44E-11	
Total HxCDF	2.29E-10	n/a		
1,2,3,4,6,7,8-HpCDF	1.11E-10	0.01	1.11E-12	
1,2,3,4,7,8,9-HpCDF	4.62E-11	0.01	4.62E-13	
Total HpCDF	2.04E-10	n/a		
Octa CDF	1.22E-10	0.0001	1.22E-14	
Total PCDF[h]	7.88E-10	n/a		
Total PCDD/PCDF[h]	2.82E-09	n/a		
TOTAL	Adjusted lb/hr	TAPs EL for 2,3,7,8 TCDD	Exceeds TAPs EL?	Modeled?
Dioxin/Furans[c]	3.35E-10	1.50E-10	Exceeds	
Non-PAH HAPs				
Acetaldehyde[e]	2.24E-02	3.00E-03	Exceeds	
Acrolein[e]	4.14E-03	0.017	No	
Benzene[e]	7.53E-03	8.00E-04	Exceeds	
1,3-Butadiene[e]				
Ethylbenzene[e]	4.06E-02	29	No	
Formaldehyde[e]	5.48E-02	5.10E-04	Exceeds	
Hexane[e]	1.49E-01	12	No	
Isooctane	6.35E-03			
Methyl Ethyl Ketone[e]	4.24E-03	39.3	No	
Pentane[e]	0.00E+00	118	No	
Propionaldehyde[e]	2.06E-02	0.0287	No	
Quinone[e]	2.53E-02	0.027	No	
Methyl chloroform[e]	7.60E-03	127	No	
Toluene[e]	4.63E-01	25	No	
Xylene[e]	4.54E-02	29	No	
TOTAL PAH HAPs (lb/hr) =	1.63E-02	9.10E-05	Exceeds	

Pollutant	TOTAL of Max Emission Rates from A, B, C & 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	3.28E-03	9.10E-05	Exceeds	
3-Methylchloranthrene[e]	0.00E+00	2.50E-06	No	
Acenaphthene	6.53E-05	9.10E-05	No	
Acenaphthylene	3.86E-04	9.10E-05	Exceeds	
Anthracene	6.47E-05	9.10E-05	No	
Benzo(a)anthracene	7.87E-06			see POM
Benzo(a)pyrene[e]	5.33E-07	2.00E-06	No	see POM
Benzo(b)fluoranthene	3.39E-06			see POM
Benzo(e)pyrene	2.75E-06	9.10E-05	No	
Benzo(g,h,i)perylene	1.31E-06	9.10E-05	No	
Benzo(k)fluoranthene	1.03E-06			see POM
Chrysene	1.95E-05			see POM
Dibenzo(a,h)anthracene	3.78E-07			see POM
Dichlorobenzene	0.00E+00	9.10E-05	No	
Fluoranthene	2.43E-05	9.10E-05	No	
Fluorene	2.92E-04	9.10E-05	Exceeds	
Indeno(1,2,3-cd)pyrene	5.30E-07			see POM
Naphthalene[e]	1.15E-02	9.10E-05	Exceeds	
Perylene	2.74E-06	9.10E-05	No	
Phenanthrene	5.72E-04	9.10E-05	Exceeds	
Pyrene	8.30E-05	9.10E-05	No	
PolycyclicOrganicMatter[d,e]	3.32E-05	2.00E-06	Exceeds	
Non-HAP Organic Compounds				
Acetone[e]	1.33E-01	119	No	
Benzaldehyde	1.74E-02			
Butane	1.06E-01			
Butyraldehyde	2.53E-02			
Crotonaldehyde[e]	1.36E-02	0.38	No	
Ethylene	1.13E+00			
Heptane	1.49E+00	109	No	
Hexanal	1.74E-02			
Isovaleraldehyde	5.07E-03			
2-Methyl-1-pentene	6.33E-01			
2-Methyl-2-butene	9.18E-02			
3-Methylpentane	3.01E-02			
1-Pentene	3.48E-01			
n-Pentane[e]	3.33E-02	118	No	
Valeraldehyde (n-Valeraldehyde[e])	1.06E-02	11.7	No	
Metals				
Antimony[e]	7.96E-05	0.033	No	
Arsenic[e]	1.40E-05	1.50E-06	Exceeds	
Barium[e]	9.43E-04	0.033	No	
Beryllium[e]	9.26E-08	2.80E-05	No	
Cadmium[e]	8.35E-06	3.70E-06	Exceeds	
Chromium[e]	8.79E-04	0.033	No	
Cobalt[e]	6.27E-05	0.0033	No	
Copper[e]	5.08E-04	0.013	No	
Hexavalent Chromium[e]	8.53E-06	5.60E-07	Exceeds	
Manganese[e]	1.25E-03	0.067	No	
Mercury[e]	4.13E-04	0.003	No	
Molybdenum[e]	7.66E-06	0.333	No	
Nickel[e]	1.36E-03	2.70E-05	Exceeds	
Phosphorus[e]	4.53E-03	0.007	No	
Silver[e]	7.60E-05	0.007	No	
Selenium[e]	6.21E-05	0.013	No	
Thallium[e]	6.49E-07	0.007	No	
Vanadium[e]	3.09E-04	0.003	No	
Zinc[e]	9.94E-03	0.667	No	

a) Reserved.
b) Toxic Air Pollutants, IDAPA 58.01.01.585 and .586, levels in effect as of January 27, 2006
c) Interim Procedures for Estimating Risks Associated with Exposures to Mixtures of Chlorinated Dibenzo-p-dioxins and Dibenzofurans (CDDs and CDFs, 1989 update, EPA/625/3-89/016, March 1989 (Source: Mike Dubois, IDEQ State Office, April 2005)
Plus 1,2,3,7,8 PeCDD,OCDD & OCDF TEFs, Van den Berg, et al, 1998, Environmental Health Perspectives 106, 775. accessed at www.dioxinfacts.org/dioxin_health/dioxin_tissues/dioxin_toxicity.html
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 PAHs shown in bold shall be considered together as one TAP equivalent in potency to benzo(a)pyrene.
e) IDAPA Toxic Air Pollutant, 58.01.01.585 or .586

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

Facility: **Aggregate Industries, SWR**

2/23/2011 9:36 **Permit/Facility ID:** **P-2010.Ge 000-00000**

TAPs EL Screen - ALL SOURCES

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

A. Drum Mix Plant: 425 Tons/hour 353 Hours/year 150,000 Tons/year 3,800 Tons/day

Maximum emission for each pollutant from any fuel-burning option selected in "Facility Data" worksheet.

B. Tank Heater: 2.0000 MMBtu Rated 2,000 Hours/year D. Include all emissions from Load-out/Silo/Storage? Yes

Maximum emission for each pollutant for heater burning any fuel selected in "Facility Data" worksheet.

C. Engine: 51.0837043 gal/hour #REF! Hours/year Small or Large Engine using Diesel Fuel

Pollutant	TOTAL of Max Emission Rates from A, B, C & D (lb/hr)	TAPs Screening Emission Limit (EL) Increment[b] (lb/hr)	TAPs Emissions Exceed EL Increment?	Modeled?
non-PAH HAPs[a]				
Bromomethane (Methyl bromide[e])	1.58E-04	1.27	No	
2-Butanone (see Methyl Ethyl Ketone)				
Carbon disulfide[e]	3.94E-04	2	No	
Chloroethane (Ethyl chloride[e])	7.86E-05	176	No	
Chloromethane (Methyl chloride[e])	5.43E-04	6.867	No	
Cumene[e]	7.24E-04	16.3	No	
n-Hexane[e] (see Hexane[e])				
Methylene chloride (Dichloromethane[e])	5.21E-06	1.60E-03	No	
MTBE	0.00E+00			
Styrene[e]	1.52E-04	6.67	No	
Tetrachloroethene (Tetrachloroethylene[e])	5.07E-05	1.30E-02	No	
1,1,1-Trichloroethane (see Methyl chloroform[e])				
Trichloroethene (Trichloroethylene[e])	0.00E+00	17.93	No	
Trichlorofluoromethane	8.56E-06			
m-/p-Xylene[e] (added into Xylene[e])				
o-Xylene[e] (added into Xylene[e])				
Phenol[e,f]	6.37E-04	1.27	No	
Non-HAP Organic Compounds				
Methane	5.44E-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

Facility: Aggregate Industries, SWR
2/23/2011 9:36 Permit/Facility ID: P-2010.Generi 000-00000

EP5- Used Oil Fired Drum Mix Asphalt Plant With Fabric Filter AP-42 Section 11.1

Fuel Type Toggle = 1
Max Hourly Production 425 T/hr
Max Daily Production 3,800 Tons/day
Max Annual Production 150,000 Tons/yr

User Input Weight % Sulfur = 0.5000%
AP-42 EF of 0.058 lb SO2/ton presumed based on high S oil. Use EF for #2 fuel oil, 0.5% S.
SO2 emissions are multiplied by a factor: User Input Value/0.5% = 1.00

Pollutant	Emission Factor[a] (lb/ton)	Emissions (lb/hr)	Emissions (T/yr)	TAPs Emissions (lb/hr) Annual or 24-hr Average
PM (total) [b]	0.033	14.025	2.475	
PM-10 (total) [b]	0.023	9.775	1.725	
P.M.-2.5 [b1]	*0.0029*			
CO [c]	0.13	55.25	9.75	
NOx [c]	0.055	23.375	4.125	
SO_2 [c]	0.058	24.65	4.35	
VOC [d]	0.032	13.6	2.4	
Lead	1.50E-05	6.38E-03	1.13E-03	
HCl [d,e]	0.00021	0.08925	1.58E-02	
Dioxins[e,f]				
2,3,7,8-TCDD	2.10E-13	8.93E-11	1.58E-11	**3.60E-12**
Total TCDD	9.30E-13	3.95E-10	6.98E-11	**1.59E-11**
1,2,3,7,8-PeCDD	3.10E-13	1.32E-10	2.33E-11	**5.31E-12**
Total PeCDD	2.20E-11	9.35E-09	1.65E-09	**3.77E-10**
1,2,3,4,7,8-HxCDD	4.20E-13	1.79E-10	3.15E-11	**7.19E-12**
1,2,3,6,7,8-HxCDD	1.30E-12	5.53E-10	9.75E-11	**2.23E-11**
1,2,3,7,8,9-HxCDD	9.80E-13	4.17E-10	7.35E-11	**1.68E-11**
Total HxCDD	1.20E-11	5.10E-09	9.00E-10	**2.05E-10**
1,2,3,4,6,7,8-Hp-CDD	4.80E-12	2.04E-09	3.60E-10	**8.22E-11**
Total HpCDD	1.90E-11	8.08E-09	1.43E-09	**3.25E-10**
Octa CDD	2.50E-11	1.06E-08	1.88E-09	**4.28E-10**
Total PCDD[h]	7.90E-11	3.36E-08	5.93E-09	**1.35E-09**
Furans[e,f]				
2,3,7,8-TCDF	9.70E-13	4.12E-10	7.28E-11	**1.66E-11**
Total TCDF	3.70E-12	1.57E-09	2.78E-10	**6.34E-11**
1,2,3,7,8-PeCDF	4.30E-12	1.83E-09	3.23E-10	**7.36E-11**
2,3,4,7,8-PeCDF	8.40E-13	3.57E-10	6.30E-11	**1.44E-11**
Total PeCDF	8.40E-11	3.57E-08	6.30E-09	**1.44E-09**
1,2,3,4,7,8-HxCDF	4.00E-12	1.70E-09	3.00E-10	**6.85E-11**
1,2,3,6,7,8-HxCDF	1.20E-12	5.10E-10	9.00E-11	**2.05E-11**
2,3,4,6,7,8-HxCDF	1.90E-12	8.08E-10	1.43E-10	**3.25E-11**
1,2,3,7,8,9-HxCDF	8.40E-12	3.57E-09	6.30E-10	**1.44E-10**
Total HxCDF	1.30E-11	5.53E-09	9.75E-10	**2.23E-10**
1,2,3,4,6,7,8-HpCDF	6.50E-12	2.76E-09	4.88E-10	**1.11E-10**
1,2,3,4,7,8,9-HpCDF	2.70E-12	1.15E-09	2.03E-10	**4.62E-11**
Total HpCDF	1.00E-11	4.25E-09	7.50E-10	**1.71E-10**
Octa CDF	4.80E-12	2.04E-09	3.60E-10	**8.22E-11**
Total PCDF[h]	4.00E-11	1.70E-08	3.00E-09	**6.85E-10**
Total PCDD/PCDF[h]	1.20E-10	5.10E-08	9.00E-09	**2.05E-09**
Non-PAH HAPs[f]				
Acetaldehyde[e]	1.30E-03	5.53E-01	9.75E-02	**2.23E-02**
Acrolein[e]	2.60E-05	1.11E-02	1.95E-03	4.12E-03
Benzene[e]	3.90E-04	1.66E-01	2.93E-02	**6.68E-03**
1,3-Butadiene[e]				
Ethylbenzene[e]	2.40E-04	1.02E-01	1.80E-02	3.80E-02
Formaldehyde[e]	3.10E-03	1.32E+00	2.33E-01	**5.31E-02**
Hexane[e]	9.20E-04	3.91E-01	6.90E-02	1.46E-01
Isooctane	4.00E-05	1.70E-02	3.00E-03	6.33E-03
Methyl Ethyl Ketone[e]	2.00E-05	8.50E-03	1.50E-03	3.17E-03
Pentane[e]				
Propionaldehyde[e]	1.30E-04	5.53E-02	9.75E-03	2.06E-02
Quinone[e]	1.60E-04	6.80E-02	1.20E-02	2.53E-02
Methyl chloroform[e]	4.80E-05	2.04E-02	3.60E-03	7.60E-03
Toluene[e]	2.90E-03	1.23E+00	2.18E-01	4.59E-01
Xylene[e]	2.00E-04	8.50E-02	1.50E-02	3.17E-02
PAH, Total		3.76E-01		**1.52E-02**
POM (7-PAH Group)		2.33E-04		**9.38E-06**

Pollutant	Emission Factor[a] (lb/ton)	Emissions (lb/hr)	Emissions (T/yr)	TAPs Emissions (lb/hr) Annual or 24-hr Average
PAH HAPs[f]				
2-Methylnaphthalene	1.70E-04	7.23E-02	1.28E-02	**2.91E-03**
3-Methylchloranthrene[e]				
Acenaphthene	1.40E-06	5.95E-04	1.05E-04	**2.40E-05**
Acenaphthylene	2.20E-05	9.35E-03	1.65E-03	**3.77E-04**
Anthracene	3.10E-06	1.32E-03	2.33E-04	**5.31E-05**
Benzo(a)anthracene	2.10E-07	8.93E-05	1.58E-05	**3.60E-06**
Benzo(a)pyrene[e]	9.80E-09	4.17E-06	7.35E-07	**1.68E-07**
Benzo(b)fluoranthene	1.00E-07	4.25E-05	7.50E-06	**1.71E-06**
Benzo(e)pyrene	1.10E-07	4.68E-05	8.25E-06	**1.88E-06**
Benzo(g,h,i)perylene	4.00E-08	1.70E-05	3.00E-06	**6.85E-07**
Benzo(k)fluoranthene	4.10E-08	1.74E-05	3.08E-06	**7.02E-07**
Chrysene	1.80E-07	7.65E-05	1.35E-05	**3.08E-06**
Dibenzo(a,h)anthracene				
Dichlorobenzene				
Fluoranthene	6.10E-07	2.59E-04	4.58E-05	**1.04E-05**
Fluorene	1.10E-05	4.68E-03	8.25E-04	**1.88E-04**
Indeno(1,2,3-cd)pyrene	7.00E-09	2.98E-06	5.25E-07	**1.20E-07**
Naphthalene[e]	6.50E-04	2.76E-01	4.88E-02	**1.11E-02**
Perylene	8.80E-09	3.74E-06	6.60E-07	**1.51E-07**
Phenanthrene	2.30E-05	9.78E-03	1.73E-03	**3.94E-04**
Pyrene	3.00E-06	1.28E-03	2.25E-04	**5.14E-05**
Non-HAP Organic Compounds[f]				
Acetone[e]	8.30E-04	3.53E-01	6.23E-02	1.31E-01
Benzaldehyde	1.10E-04	4.68E-02	8.25E-03	1.74E-02
Butane	6.70E-04	2.85E-01	5.03E-02	1.06E-01
Butyraldehyde	1.60E-04	6.80E-02	1.20E-02	2.53E-02
Crotonaldehyde[e]	8.60E-05	3.66E-02	6.45E-03	1.36E-02
Ethylene	7.00E-03	2.98E+00	5.25E-01	1.11E+00
Heptane	9.40E-03	4.00E+00	7.05E-01	1.49E+00
Hexanal	1.10E-04	4.68E-02	8.25E-03	1.74E-02
Isovaleraldehyde	3.20E-05	1.36E-02	2.40E-03	5.07E-03
2-Methyl-1-pentene	4.00E-03	1.70E+00	3.00E-01	6.33E-01
2-Methyl-2-butene	5.80E-04	2.47E-01	4.35E-02	9.18E-02
3-Methylpentane	1.90E-04	8.08E-02	1.43E-02	3.01E-02
1-Pentene	2.20E-03	9.35E-01	1.65E-01	3.48E-01
n-Pentane	2.10E-04	8.93E-02	1.58E-02	3.33E-02
Valeraldehyde[e]	6.70E-05	2.85E-02	5.03E-03	1.06E-02
Metals[g]				
Antimony[e]	1.80E-07	7.65E-05	1.35E-05	2.85E-05
Arsenic[e]	5.60E-07	2.38E-04	4.20E-05	**9.59E-06**
Barium[e]	5.80E-06	2.47E-03	4.35E-04	9.18E-04
Beryllium[e]				
Cadmium[e]	4.10E-07	1.74E-04	3.08E-05	**7.02E-06**
Chromium[e]	5.50E-06	2.34E-03	4.13E-04	8.71E-04
Cobalt[e]	2.60E-08	1.11E-05	1.95E-06	4.12E-06
Copper[e]	3.10E-06	1.32E-03	2.33E-04	4.91E-04
Hexavalent Chromium[e]	4.50E-07	1.91E-04	3.38E-05	**7.71E-06**
Manganese[e]	7.70E-06	3.27E-03	5.78E-04	1.22E-03
Mercury[e]	2.60E-06	1.11E-03	1.95E-04	4.12E-04
Molybdenum[e]				
Nickel[e]	6.30E-05	2.68E-02	4.73E-03	**1.08E-03**
Phosphorus[e]	2.80E-05	1.19E-02	2.10E-03	4.43E-03
Silver[e]	4.80E-07	2.04E-04	3.60E-05	7.60E-05
Selenium[e]	3.50E-07	1.49E-04	2.63E-05	5.54E-05
Thallium[e]	4.10E-09	1.74E-06	3.08E-07	6.49E-07
Vanadium[e]				
Zinc[e]	6.10E-05	2.59E-02	4.58E-03	9.66E-03

a) Emission factors are from AP-42 11.1, Hot Mix Asphalt Plants, 3/04
b) AP-42, Table 11.1-3, Particulate Matter Emission Factors for Drum Mix Hot Asphalt Plants, 3/04
b1) AP-42, Table 11.1-4, Summary of Particle Size Distribution for Drum Mix Dryers **(Emission Rating Factor E - "Poor")**
c) AP-42, Table 11.1-7, Emission Factors for CO, CO2, NOx, and SO2 from Drum Mix Hot Asphalt Plants, 3/04
SO2 for AP-42 = 0.058. assuming use of RFO.
d) AP-42, Table 11.1-8, Emission Factors for TOC, Methane, VOC, and HCl from Drum Mix Hot Asphalt Plants, 3/04
e) IDAPA Toxic Air Pollutant
f) AP-42, Table 11.1-10, Emission Factors for Organic Pollutant Emissions from Drum Mix Hot Asphalt Plants, 3/04
g) AP-42, Table 11.1-12, Emission Factors for Metal Emissions from Drum Mix Hot Mix Asphalt Plants, 3/04
h) Compound is classified as polycyclic organic matter, as defined in the 1990 CAAA. Total PCDD is the sum of the total tetra through octa dioxins; total PCDF is sum of the total tetra through octa furans; and total PCDD/PCDF is the sum of total PCDD and total PCDF.
Pollutants shown in bold/blue text are emitted when using Used Oil but not when using #2 Fuel Oil or Natural Gas.
Pollutants shown in magenta are emitted when using Used Oil or #2 Fuel Oil, but not when using Natural Gas

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

Facility: **Aggregate Industries, SWR**
2/23/2011 9:36 **Permit/Facility ID: P-2010.Ger 000-00000**

#2 Fuel Oil Fired Drum Mix Asphalt Plant With Fabric Filter AP-42 Section 11.1

Fuel Type Toggle = 1
Hourly Production 425 T/hr
Daily Production 3,800 Tons/day
Max Annual Production 150,000 Tons/yr

User Input Weight % Sulfur = 0.5000%
AP-42 EF of 0.011 lb SO2/ton presumed based on #2 oil, max 0.5% sulfur content
SO2 emissions are multiplied by a factor: User Input Value/0.5% = 1.00

*(lb/hr) Maximum based on maximum hourly HMA production, (T/yr) based on maximum annual producton, TAPs based on (T/yr)*2000 lb/T*yr/8760 hrs

*Pollutant	Emission Factor[a] (lb/ton)	*Emissions (lb/hr) Maximum	*Emissions (T/yr)	**TAPs Emissions (lb/hr) Annual or 24-hr Average
PM (total)[b]	0.033	14.0	2.475	
PM-10 (total)[b]	0.023	9.8	1.725	
P.M.-2.5[b1]	*0.0029*			
CO[c]	0.13	55.3	9.75	
NOx[c]	0.055	23.4	4.1	
SO_2[c]	0.011	4.68	0.825	
VOC[d]	0.032	13.6	2.4	
Lead	1.50E-05	6.38E-03	1.13E-03	
HCl[d,e]	No Data			
Dioxins[e]				
2,3,7,8-TCDD	2.10E-13	8.925E-11	1.58E-11	**3.60E-12**
Total TCDD	9.30E-13	3.953E-10	6.98E-11	**1.59E-11**
1,2,3,7,8-PeCDD	3.10E-13	1.318E-10	2.33E-11	**5.31E-12**
Total PeCDD	2.20E-11	9.35E-09	1.65E-09	**3.77E-10**
1,2,3,4,7,8-HxCDD	4.20E-13	1.785E-10	3.15E-11	**7.19E-12**
1,2,3,6,7,8-HxCDD	1.30E-12	5.525E-10	9.75E-11	**2.23E-11**
1,2,3,7,8,9-HxCDD	9.80E-13	4.165E-10	7.35E-11	**1.68E-11**
Total HxCDD	1.20E-11	5.1E-09	9.00E-10	**2.05E-10**
1,2,3,4,6,7,8-Hp-CDD	4.80E-12	2.04E-09	3.60E-10	**8.22E-11**
Total HpCDD	1.90E-11	8.075E-09	1.43E-09	**3.26E-10**
Octa CDD	2.50E-11	1.063E-08	1.88E-09	**4.28E-10**
Total PCDD[h]	7.90E-11	3.358E-08	5.93E-09	**1.35E-09**
Furans[e]				
2,3,7,8-TCDF	9.70E-13	4.123E-10	7.28E-11	**1.66E-11**
Total TCDF	3.70E-12	1.573E-09	2.78E-10	**6.34E-11**
1,2,3,7,8-PeCDF	4.30E-12	1.828E-09	3.23E-10	**7.36E-11**
2,3,4,7,8-PeCDF	8.40E-13	3.57E-10	6.30E-11	**1.44E-11**
Total PeCDF	8.40E-11	3.57E-08	6.30E-09	**1.44E-09**
1,2,3,4,7,8-HxCDF	4.00E-12	1.7E-09	3.00E-10	**6.85E-11**
1,2,3,6,7,8-HxCDF	1.20E-12	5.1E-10	9.00E-11	**2.05E-11**
2,3,4,6,7,8-HxCDF	1.90E-12	8.075E-10	1.43E-10	**3.25E-11**
1,2,3,7,8,9-HxCDF	8.40E-12	3.57E-09	6.30E-10	**1.44E-10**
Total HxCDF	1.30E-11	5.525E-09	9.75E-10	**2.23E-10**
1,2,3,4,6,7,8-HpCDF	6.50E-12	2.763E-09	4.88E-10	**1.11E-10**
1,2,3,4,7,8,9-HpCDF	2.70E-12	1.148E-09	2.03E-10	**4.62E-11**
Total HpCDF	1.00E-11	4.25E-09	7.50E-10	**1.71E-10**
Octa CDF	4.80E-12	2.04E-09	3.60E-10	**8.22E-11**
Total PCDF[h]	4.00E-11	1.7E-08	3.00E-09	**6.85E-10**
Total PCDD/PCDF[h]	1.20E-10	5.1E-08	9.00E-09	**2.05E-09**
Non-PAH HAPs[f]				
Acetaldehyde[e]				
Acrolein[e]				
Benzene[e]	3.90E-04	1.66E-01	2.93E-02	**6.68E-03**
1,3-Butadiene[e]				
Ethylbenzene[e]	2.40E-04	1.02E-01	1.80E-02	3.80E-02
Formaldehyde[e]	3.10E-03	1.32E+00	2.33E-01	**5.31E-02**
Hexane[e]	9.20E-04	3.91E-01	6.90E-02	1.46E-01
Isooctane	4.00E-05	1.70E-02	3.00E-03	6.33E-03
Methyl Ethyl Ketone[e]				
Pentane[e]				
Propionaldehyde[e]				
Quinone[e]				
Methyl chloroform[e]	4.80E-05	2.04E-02	3.60E-03	7.60E-03
Toluene[e]	2.90E-03	1.23E+00	2.18E-01	4.59E-01
Xylene[e]	2.00E-04	8.50E-02	1.50E-02	3.17E-02
PAH, Total		3.76E-01		**1.62E-02**
POM (7-PAH Group)		2.33E-04		**9.38E-06**

Pollutant	Emission Factor[a] (lb/ton)	Emissions (lb/hr) Maximum	Emissions (T/yr)	TAPs Emissions (lb/hr) Annual or 24-hr Average
PAH HAPs[f]				
2-Methylnaphthalene	0.00017	7.23E-02	1.28E-02	**2.91E-03**
3-Methylchloranthrene[e]				
Acenaphthene	1.40E-06	5.95E-04	1.05E-04	**2.40E-05**
Acenaphthylene	2.20E-05	9.35E-03	1.65E-03	**3.77E-04**
Anthracene	3.10E-06	1.32E-03	2.33E-04	**5.31E-05**
Benzo(a)anthracene	2.10E-07	8.93E-05	1.58E-05	**3.60E-06**
Benzo(a)pyrene[e]	9.80E-09	4.17E-06	7.35E-07	**1.68E-07**
Benzo(b)fluoranthene	1.00E-07	4.25E-05	7.50E-06	**1.71E-06**
Benzo(e)pyrene	1.10E-07	4.68E-05	8.25E-06	**1.88E-06**
Benzo(g,h,i)perylene	4.00E-08	1.70E-05	3.00E-06	**6.85E-07**
Benzo(k)fluoranthene	4.10E-08	1.74E-05	3.08E-06	**7.02E-07**
Chrysene	1.80E-07	7.65E-05	1.35E-05	**3.08E-06**
Dibenzo(a,h)anthracene				
Dichlorobenzene				
Fluoranthene	6.10E-07	2.59E-04	4.58E-05	**1.04E-05**
Fluorene	1.10E-05	4.68E-03	8.25E-04	**1.88E-04**
Indeno(1,2,3-cd)pyrene	7.00E-09	2.98E-06	5.25E-07	**1.20E-07**
Naphthalene[e]	0.00065	2.76E-01	4.88E-02	**1.11E-02**
Perylene	8.80E-09	3.74E-06	6.60E-07	**1.51E-07**
Phenanthrene	2.30E-05	9.78E-03	1.73E-03	**3.94E-04**
Pyrene	3.00E-06	1.28E-03	2.25E-04	**5.14E-05**
Non-HAP Organic Compounds[f]				
Acetone[e]				
Benzaldehyde				
Butane	6.70E-04	2.85E-01	5.03E-02	1.06E-01
Butyraldehyde				0.00E+00
Crotonaldehyde[e]				
Ethylene	7.00E-03	2.98E+00	5.25E-01	1.11E+00
Heptane	9.40E-03	4.00E+00	7.05E-01	1.49E+00
Hexanal				
Isovaleraldehyde				
2-Methyl-1-pentene	4.00E-03	1.70E+00	3.00E-01	6.33E-01
2-Methyl-2-butene	5.80E-04	2.47E-01	4.35E-02	9.18E-02
3-Methylpentane	1.90E-04	8.08E-02	1.43E-02	3.01E-02
1-Pentene	2.20E-03	9.35E-01	1.65E-01	3.48E-01
n-Pentane	2.10E-04	8.93E-02	1.58E-02	3.33E-02
Valeraldehyde				
Metals[g]				
Antimony[e]	1.80E-07	7.65E-05	1.35E-05	2.85E-05
Arsenic[e]	5.60E-07	2.38E-04	4.20E-05	**9.59E-06**
Barium[e]	5.80E-06	2.47E-03	4.35E-04	9.18E-04
Beryllium[e]				
Cadmium[e]	4.10E-07	1.74E-04	3.08E-05	**7.02E-06**
Chromium[e]	5.50E-06	2.34E-03	4.13E-04	8.71E-04
Cobalt[e]	2.60E-08	1.11E-05	1.95E-06	4.12E-06
Copper[e]	3.10E-06	1.32E-03	2.33E-04	4.91E-04
Hexavalent Chromium[e]	4.50E-07	1.91E-04	3.38E-05	**7.71E-06**
Manganese[e]	7.70E-06	3.27E-03	5.78E-04	1.22E-03
Mercury[e]	2.60E-06	1.11E-03	1.95E-04	4.12E-04
Molybdenum[e]				
Nickel[e]	6.30E-05	2.68E-02	4.73E-03	**1.08E-03**
Phosphorus[e]	2.80E-05	1.19E-02	2.10E-03	4.43E-03
Silver[e]	4.80E-07	2.04E-04	3.60E-05	7.60E-05
Selenium[e]	3.50E-07	1.49E-04	2.63E-05	5.54E-05
Thallium[e]	4.10E-09	1.74E-06	3.08E-07	6.49E-07
Vanadium[e]				
Zinc[e]	6.10E-05	2.59E-02	4.58E-03	9.66E-03

a) Emission factors are from AP-42 11.1, Hot Mix Asphalt Plants, 3/04
b) AP-42, Table 11.1-3, Particulate Matter Emission Factors for Drum Mix Hot Asphalt Plants, 3/04
b1) AP-42, Table 11.1-4, Summary of Particle Size Distribution for Drum Mix Dryers **(Emission Rating Factor E - "Poor")**
c) AP-42, Table 11.1-7, Emission Factors for CO, CO2, NOx, and SO2 from Drum Mix Hot Asphalt Plants, 3/04
d) AP-42, Table 11.1-8, Emission Factors for TOC, Methane, VOC, and HCl from Drum Mix Hot Asphalt Plants, 3/04
e) IDAPA Toxic Air Pollutant
f) AP-42, Table 11.1-10, Emission Factors for Organic Pollutant Emissions from Drum Mix Hot Asphalt Plants, 3/04
g) AP-42, Table 11.1-12, Emission Factors for Metal Emissions from Drum Mix Hot Mix Asphalt Plants, 3/04
h) Compound is classified as polycyclic organic matter, as defined in the 1990 CAAA. Total PCDD is the sum of the total tetra through octa dioxins; total PCDF is sum of the total tetra through octa furans; and total PCDD/PCDF is the sum of total PCDD and total PCDF.

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: Aggregate Industries, SWR
2/23/2011 9:36 Permit/ Facility ID: P-2010.Gen 000-00000

Natural Gas Fired Drum Mix Asphalt Plant With Fabric Filter AP-42 Section 11.1

Fuel Type Toggle =	0	
Max Hourly Production	425	Tons/hr
Max Daily Production	3,800	Tons/day
Max Annual Production	150,000	Tons/yr (Proposed Throughput Limit)

Pollutant	Emission Factor[a] (lb/ton)	Emissions (lb/hr)	Emissions (T/yr)	TAPs Emissions (lb/hr) Annual or 24-hr Average
PM (total)[b]	0.033	0	0	
PM-10 (total)[b]	0.023	0	0	
P.M.-2.5 [b1]	*0.0029*			
CO [c]	0.13	0	0	
NOx [c]	0.026	0	0	
SO_2 [c]	0.0034	0	0	
VOC [d]	0.032	0	0	
Lead	6.20E-07	0.00E+00	0.00E+00	
HCl [d,e]	No Data			
Dioxins[e]				
-- No EFs for Natural Gas Fuel --				
Furans[e]				
-- No EFs for Natural Gas Fuel --				
Non-PAH HAPs[f]				
Acetaldehyde[e]				
Acrolein[e]				
Benzene[e]	3.90E-04	0.00E+00	0.00E+00	**0.00E+00**
1,3-Butadiene[e]				
Ethylbenzene[e]	2.40E-04	0.00E+00	0.00E+00	0.00E+00
Formaldehyde[e]	3.10E-03	0.00E+00	0.00E+00	**0.00E+00**
Hexane[e]	9.20E-04	0.00E+00	0.00E+00	0.00E+00
Isooctane	4.00E-05	0.00E+00	0.00E+00	0.00E+00
Methyl Ethyl Ketone[e]				
Pentane[e]				
Propionaldehyde[e]				
Quinone[e]				
Methyl chloroform[e]	4.80E-05	0.00E+00	0.00E+00	0.00E+00
Toluene[e]	1.50E-04	0.00E+00	0.00E+00	0.00E+00
Xylene[e]	2.00E-04	0.00E+00	0.00E+00	0.00E+00
PAH, Total		0.00E+00		**0.00E+00**
POM (7-PAH Group)		0.00E+00		**0.00E+00**

Pollutant	Emission Factor[a] (lb/ton)	Emissions (lb/hr)	Emissions (T/yr)	TAPS Emissions (lb/hr) Annual or 24-hr Average
PAH HAPs[f]				
2-Methylnaphthalene	7.40E-05	0.00E+00	0.00E+00	**0.00E+00**
3-Methylchloranthrene[e]				
Acenaphthene	1.40E-06	0.00E+00	0.00E+00	**0.00E+00**
Acenaphthylene	8.60E-06	0.00E+00	0.00E+00	**0.00E+00**
Anthracene	2.20E-07	0.00E+00	0.00E+00	**0.00E+00**
Benzo(a)anthracene	2.10E-07	0.00E+00	0.00E+00	**0.00E+00**
Benzo(a)pyrene[e]	9.80E-09	0.00E+00	0.00E+00	**0.00E+00**
Benzo(b)fluoranthene	1.00E-07	0.00E+00	0.00E+00	**0.00E+00**
Benzo(e)pyrene	1.10E-07	0.00E+00	0.00E+00	**0.00E+00**
Benzo(g,h,i)perylene	4.00E-08	0.00E+00	0.00E+00	**0.00E+00**
Benzo(k)fluoranthene	4.10E-08	0.00E+00	0.00E+00	**0.00E+00**
Chrysene	1.80E-07	0.00E+00	0.00E+00	**0.00E+00**
Dibenzo(a,h)anthracene				
Dichlorobenzene				
Fluoranthene	6.10E-07	0.00E+00	0.00E+00	**0.00E+00**
Fluorene	3.80E-06	0.00E+00	0.00E+00	**0.00E+00**
Indeno(1,2,3-cd)pyrene	7.00E-09	0.00E+00	0.00E+00	**0.00E+00**
Naphthalene[e]	9.00E-05	0.00E+00	0.00E+00	**0.00E+00**
Perylene	8.80E-09	0.00E+00	0.00E+00	**0.00E+00**
Phenanthrene	7.60E-06	0.00E+00	0.00E+00	**0.00E+00**
Pyrene	5.40E-07	0.00E+00	0.00E+00	**0.00E+00**
Non-HAPs Organic Compounds[f]				
Acetone[e]				
Benzaldehyde				
Butane	6.70E-04	0.00E+00	0.00E+00	0.00E+00
Butyraldehyde				
Crotonaldehyde[e]				
Ethylene	7.00E-03	0.00E+00	0.00E+00	0.00E+00
Heptane	9.40E-03	0.00E+00	0.00E+00	0.00E+00
Hexanal				
Isovaleraldehyde				
2-Methyl-1-pentene	4.00E-03	0.00E+00	0.00E+00	0.00E+00
2-Methyl-2-butene	5.80E-04	0.00E+00	0.00E+00	0.00E+00
3-Methylpentane	1.90E-04	0.00E+00	0.00E+00	0.00E+00
1-Pentene	2.20E-03	0.00E+00	0.00E+00	0.00E+00
n-Pentane	2.10E-04	0.00E+00	0.00E+00	0.00E+00
Valeraldehyde				
Metals[g]				
Antimony[e]	1.80E-07	0.00E+00	0.00E+00	0.00E+00
Arsenic[e]	5.60E-07	0.00E+00	0.00E+00	**0.00E+00**
Barium[e]	5.80E-06	0.00E+00	0.00E+00	0.00E+00
Beryllium[e]				
Cadmium[e]	4.10E-07	0.00E+00	0.00E+00	**0.00E+00**
Chromium[e]	5.50E-06	0.00E+00	0.00E+00	0.00E+00
Cobalt[e]	2.60E-08	0.00E+00	0.00E+00	0.00E+00
Copper[e]	3.10E-06	0.00E+00	0.00E+00	0.00E+00
Hexavalent Chromium[e]	4.50E-07	0.00E+00	0.00E+00	**0.00E+00**
Manganese[e]	7.70E-06	0.00E+00	0.00E+00	0.00E+00
Mercury[e]	2.40E-07	0.00E+00	0.00E+00	0.00E+00
Molybdenum[e]				
Nickel[e]	6.30E-05	0.00E+00	0.00E+00	**0.00E+00**
Phosphorus[e]	2.80E-05	0.00E+00	0.00E+00	0.00E+00
Silver[e]	4.80E-07	0.00E+00	0.00E+00	0.00E+00
Selenium[e]	3.50E-07	0.00E+00	0.00E+00	0.00E+00
Thallium[e]	4.10E-09	0.00E+00	0.00E+00	0.00E+00
Vanadium[e]				
Zinc[e]	6.10E-05	0.00E+00	0.00E+00	0.00E+00

a) Emission factors are from AP-42 11.1, Hot Mix Asphalt Plants, 3/04
b) AP-42, Table 11.1-3, Particulate Matter Emission Factors for Drum Mix Hot Asphalt Plants, 3/04
b1) AP-42, Table 11.1-4, Summary of Particle Size Distribution for Drum Mix Dryers **(Emission Rating Factor E - "Poor")**
c) AP-42, Table 11.1-7, Emission Factors for CO, CO2, NOx, and SO2 from Drum Mix Hot Asphalt Plants, 3/04
d) AP-42, Table 11.1-8, Emission Factors for TOC, Methane, VOC, and HCl from Drum Mix Hot Asphalt Plants, 3/04
e) IDAPA Toxic Air Pollutant
f) AP-42, Table 11.1-10, Emission Factors for Organic Pollutant Emissions from Drum Mix Hot Asphalt Plants, 3/04
g) AP-42, Table 11.1-12, Emission Factors for Metal Emissions from Drum Mix Hot Mix Asphalt Plants, 3/04

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: Aggregate Industries, SWR
2/23/2011 9:36 Permit/ Facility ID: P-2010.Gen 000-00000

LPG or Propane Fired Drum Mix Asphalt Plant With Fabric Filter

Fuel Type Toggle =	0	
Max Hourly Production	425	Tons/hr
Max Daily Production	3,800	Tons/day
Max Annual Production	150,000	Tons/yr

Note: Presumes same emissions as natural gas except for NOx (see AP-42, Section 1.5, Liquefied Petroleum Gas Combustion)
SO2 emissions from natural gas are ~70% lower than with #2 Fuel Oil, and ~94% lower than with Used Oil or #6 Fuel Oil (minimal impact on emissions, used Nat Gas EF)

Pollutant	Emission Factor[a] (lb/ton)	Emissions (lb/hr)	Emissions (T/yr)	TAPs Emissions (lb/hr) Annual or 24-hr Average
PM (total)[b]	0.033	0	0	
PM-10 (total)[b]	0.023	0	0	
P.M.-2.5 [b1]	*0.0029*			
CO [c]	0.13	0	0	
NOx [c1] (Natural Gas EF x 1.5)	0.039	0	0	
SO_2 [c]	0.0034	0	0	
VOC [d]	0.032	0	0	
Lead	6.20E-07	0	0.00E+00	
HCl [d,e]	No Data			
Dioxins[e]				
-- No EFs for LP Gas or Propane Fuel --				
Furans[e]				
-- No EFs for LP Gas or Propane Fuel --				
Non-PAH HAPs[f]				
Acetaldehyde[e]				
Acrolein[e]				
Benzene[e]	3.90E-04	0.00E+00	0.00E+00	**0.00E+00**
1,3-Butadiene[e]				
Ethylbenzene[e]	2.40E-04	0.00E+00	0.00E+00	0.00E+00
Formaldehyde[e]	3.10E-03	0.00E+00	0.00E+00	**0.00E+00**
Hexane[e]	9.20E-04	0.00E+00	0.00E+00	0.00E+00
Isooctane	4.00E-05	0.00E+00	0.00E+00	0.00E+00
Methyl Ethyl Ketone[e]				
Pentane[e]				
Propionaldehyde[e]				
Quinone[e]				
Methyl chloroform[e]	4.80E-05	0.00E+00	0.00E+00	0.00E+00
Toluene[e]	1.50E-04	0.00E+00	0.00E+00	0.00E+00
Xylene[e]	2.00E-04	0.00E+00	0.00E+00	0.00E+00
PAH, Total		0.00E+00		**0.00E+00**
POM (7-PAH Group)		0.00E+00		**0.00E+00**

Pollutant	Emission Factor[a] (lb/ton)	Emissions (lb/hr)	Emissions (T/yr)	TAPs Emissions (lb/hr) Annual or 24-hr Average
PAH HAPs[f]				
2-Methylnaphthalene	7.40E-05	0.00E+00	0.00E+00	**0.00E+00**
3-Methylchloranthrene[e]				
Acenaphthene	1.40E-06	0.00E+00	0.00E+00	**0.00E+00**
Acenaphthylene	8.60E-06	0.00E+00	0.00E+00	**0.00E+00**
Anthracene	2.20E-07	0.00E+00	0.00E+00	**0.00E+00**
Benzo(a)anthracene	2.10E-07	0.00E+00	0.00E+00	**0.00E+00**
Benzo(a)pyrene[e]	9.80E-09	0.00E+00	0.00E+00	**0.00E+00**
Benzo(b)fluoranthene	1.00E-07	0.00E+00	0.00E+00	**0.00E+00**
Benzo(e)pyrene	1.10E-07	0.00E+00	0.00E+00	**0.00E+00**
Benzo(g,h,i)perylene	4.00E-08	0.00E+00	0.00E+00	**0.00E+00**
Benzo(k)fluoranthene	4.10E-08	0.00E+00	0.00E+00	**0.00E+00**
Chrysene	1.80E-07	0.00E+00	0.00E+00	**0.00E+00**
Dibenzo(a,h)anthracene				
Dichlorobenzene				
Fluoranthene	6.10E-07	0.00E+00	0.00E+00	**0.00E+00**
Fluorene	3.80E-06	0.00E+00	0.00E+00	**0.00E+00**
Indeno(1,2,3-cd)pyrene	7.00E-09	0.00E+00	0.00E+00	**0.00E+00**
Naphthalene[e]	9.00E-05	0.00E+00	0.00E+00	**0.00E+00**
Perylene	8.80E-09	0.00E+00	0.00E+00	**0.00E+00**
Phenanthrene	7.60E-06	0.00E+00	0.00E+00	**0.00E+00**
Pyrene	5.40E-07	0.00E+00	0.00E+00	**0.00E+00**
Non-HAPs Organic Compounds[f]				
Acetone[e]				
Benzaldehyde				
Butane	6.70E-04	0.00E+00	0.00E+00	0.00E+00
Butyraldehyde				
Crotonaldehyde[e]				
Ethylene	7.00E-03	0.00E+00	0.00E+00	0.00E+00
Heptane	9.40E-03	0.00E+00	0.00E+00	0.00E+00
Hexanal				
Isovaleraldehyde				
2-Methyl-1-pentene	4.00E-03	0.00E+00	0.00E+00	0.00E+00
2-Methyl-2-butene	5.80E-04	0.00E+00	0.00E+00	0.00E+00
3-Methylpentane	1.90E-04	0.00E+00	0.00E+00	0.00E+00
1-Pentene	2.20E-03	0.00E+00	0.00E+00	0.00E+00
n-Pentane	2.10E-04	0.00E+00	0.00E+00	0.00E+00
Valeraldehyde				
Metals[g]				
Antimony[e]	1.80E-07	0.00E+00	0.00E+00	0.00E+00
Arsenic[e]	5.60E-07	0.00E+00	0.00E+00	**0.00E+00**
Barium[e]	5.80E-06	0.00E+00	0.00E+00	0.00E+00
Beryllium[e]				
Cadmium[e]	4.10E-07	0.00E+00	0.00E+00	**0.00E+00**
Chromium[e]	5.50E-06	0.00E+00	0.00E+00	0.00E+00
Cobalt[e]	2.60E-08	0.00E+00	0.00E+00	0.00E+00
Copper[e]	3.10E-06	0.00E+00	0.00E+00	0.00E+00
Hexavalent Chromium[e]	4.50E-07	0.00E+00	0.00E+00	**0.00E+00**
Manganese[e]	7.70E-06	0.00E+00	0.00E+00	0.00E+00
Mercury[e]	2.40E-07	0.00E+00	0.00E+00	0.00E+00
Molybdenum[e]				
Nickel[e]	6.30E-05	0.00E+00	0.00E+00	**0.00E+00**
Phosphorus[e]	2.80E-05	0.00E+00	0.00E+00	0.00E+00
Silver[e]	4.80E-07	0.00E+00	0.00E+00	0.00E+00
Selenium[e]	3.50E-07	0.00E+00	0.00E+00	0.00E+00
Thallium[e]	4.10E-09	0.00E+00	0.00E+00	0.00E+00
Vanadium[e]				
Zinc[e]	6.10E-05	0.00E+00	0.00E+00	0.00E+00

a) Emission factors are from AP-42 11.1, Hot Mix Asphalt Plants, 3/04
b) AP-42, Table 11.1-3, Particulate Matter Emission Factors for Drum Mix Hot Asphalt Plants, 3/04
b1) AP-42, Table 11.1-4, Summary of Particle Size Distribution for Drum Mix Dryers **(Emission Rating Factor E - "Poor")**
c) AP-42, Table 11.1-7, Emission Factors for CO, CO2, NOx, and SO2 from Drum Mix Hot Asphalt Plants, 3/04
c1) AP-42, Table 1.5-1, Emission Factors for LPG Combustion, note (a): "Assumes emissions (except SOx and NOx) are the same, on a heat input basis, as for natural gas combustion. The NOx emission factors have been multiplied by a factor of 1.5, which is the approximate ration of propane/butane NOx emissions to natural gas NOx emissions.
d) AP-42, Table 11.1-8, Emission Factors for TOC, Methane, VOC, and HCl from Drum Mix Hot Asphalt Plants, 3/04
e) IDAPA Toxic Air Pollutant
f) AP-42, Table 11.1-10, Emission Factors for Organic Pollutant Emissions from Drum Mix Hot Asphalt Plants, 3/04
g) AP-42, Table 11.1-12, Emission Factors for Metal Emissions from Drum Mix Hot Mix Asphalt Plants, 3/04

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

EP7 - Asphalt Tank Heater - #2 Oil Fired, Estimated Emissions Using AP42 Sections 11.1 (HMA Plants) & 1.3 (Fuel Oil Combustion)

Fuel Type Toggle =	1	
Fuel Consumption Rate	14.60	gal/hr
Max Daily Operation	16	hr/day
Max Annual Operation	2,000	hrs/yr

User Input Weight % Sulfur = 0.0015%
AP-42 1.3-1 EF is 0.142S lb SO2 per gallon of fuel oil

Pollutant	Emission Factor[a] (lb/gal)	Emissions (lb/hr)	Emissions (T/yr)	TAPs Emissions (lb/hr) Annual or 24-hr Average
PM (total) [b] (filterable+cond)	0.0033	4.82E-02	0.05	
PM-10 (total) [b] (filterable+con	0.0033	4.82E-02	0.05	
P.M.-2.5				
CO [b] ("C" EF Rating Factor)	0.005	7.30E-02	0.07	
NOx [b]	0.02	2.92E-01	0.29	
SO_2 [b]	0.000213	0.00	0.00	
VOC [d] (TOC EF)	5.56E-04	8.12E-03	8.12E-03	
Lead[f]	1.51E-06	2.20E-05	2.20E-05	
HCl [e]				
Dioxins[e]				
2,3,7,8-TCDD				
Total TCDD				
1,2,3,7,8-PeCDD				
Total PeCDD				
1,2,3,4,7,8-HxCDD[c]	6.90E-13	1.01E-11	1.01E-11	**2.30E-12**
1,2,3,6,7,8-HxCDD				
1,2,3,7,8,9-HxCDD[c]	7.60E-13	1.11E-11	1.11E-11	**2.53E-12**
Total HxCDD				
1,2,3,4,6,7,8-Hp-CDD[c]	1.50E-11	2.19E-10	2.19E-10	**5.00E-11**
Total HpCDD[c]	2.00E-11	2.92E-10	2.92E-10	**6.66E-11**
Octa CDD[c]	1.60E-10	2.34E-09	2.34E-09	**5.33E-10**
Total PCDD[c]	2.00E-10	2.92E-09	2.92E-09	**6.66E-10**
Furans[e]				
2,3,7,8-TCDF				
Total TCDF[c]	3.30E-12	4.82E-11	4.82E-11	**1.10E-11**
1,2,3,7,8-PeCDF				
2,3,4,7,8-PeCDF				
Total PeCDF[c]	4.80E-13	7.01E-12	7.01E-12	**1.60E-12**
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[c]	2.00E-12	2.92E-11	2.92E-11	**6.66E-12**
1,2,3,4,6,7,8-HpCDF				
1,2,3,4,7,8,9-HpCDF				
Total HpCDF[c]	9.70E-12	1.42E-10	1.42E-10	**3.23E-11**
Octa CDF[c]	1.20E-11	1.75E-10	1.75E-10	**4.00E-11**
Total PCDF[c]	3.10E-11	4.52E-10	4.52E-10	**1.03E-10**
Total PCDD/PCDF[c]	2.30E-10	3.36E-09	3.36E-09	**7.66E-10**
Non-PAH HAPs				
Acetaldehyde[e]				
Acrolein[e]				
Benzene[e]				
1,3-Butadiene[e]				
Ethylbenzene[e]				
Formaldehyde[c,e]	3.50E-06	5.11E-05	5.11E-05	**1.17E-05**
Hexane[e]				
Isooctane				
Methyl Ethyl Ketone[e]				
Pentane[e]				
Propionaldehyde[e]				
Quinone[e]				
Methyl chloroform[e]				
Toluene[e]				
Xylene[e]				
PAH, Total		3.36E-04		**7.67E-05**
POM (7-PAH Group)		1.46E-06		**3.33E-07**

Pollutant	Emission Factor[a] (lb/gal)	Emissions (lb/hr)	Emissions (T/yr)	TAPs Emissions (lb/hr) Annual or 24-hr Average
PAH HAPs				
2-Methylnaphthalene				
3-Methylchloranthrene[e]				
Acenaphthene[c]	5.30E-07	7.74E-06	7.74E-06	**1.77E-06**
Acenaphthylene[c]	2.00E-07	2.92E-06	2.92E-06	**6.66E-07**
Anthracene[c]	1.80E-07	2.63E-06	2.63E-06	**6.00E-07**
Benzo(a)anthracene				
Benzo(a)pyrene[e]				
Benzo(b)fluoranthene[c]	1.00E-07	1.46E-06	1.46E-06	**3.33E-07**
Benzo(e)pyrene				
Benzo(g,h,i)perylene				
Benzo(k)fluoranthene				
Chrysene				
Dibenzo(a,h)anthracene				
Dichlorobenzene				
Fluoranthene[c]	4.40E-08	6.42E-07	6.42E-07	**1.47E-07**
Fluorene[c]	3.20E-08	4.67E-07	4.67E-07	**1.07E-07**
Indeno(1,2,3-cd)pyrene				
Naphthalene[c,e]	1.70E-05	2.48E-04	2.48E-04	**5.66E-05**
Perylene				
Phenanthrene[c]	4.90E-06	7.15E-05	7.15E-05	**1.63E-05**
Pyrene[c]	3.20E-08	4.67E-07	4.67E-07	**1.07E-07**
Non-HAP Organic Compounds				
Acetone[e]				
Benzaldehyde				
Butane				
Butyraldehyde				
Crotonaldehyde[e]				
Ethylene				
Heptane				
Hexanal				
Isovaleraldehyde				
2-Methyl-1-pentene				
2-Methyl-2-butene				
3-Methylpentane				
1-Pentene				
n-Pentane				
Valeraldehyde				
Metals[f]				
Antimony[e]	5.25E-06	7.66E-05	7.66E-05	5.11E-05
Arsenic[e]	1.32E-06	1.93E-05	1.93E-05	**4.40E-06**
Barium[e]	2.57E-06	3.75E-05	3.75E-05	2.50E-05
Beryllium[e]	2.78E-08	4.06E-07	4.06E-07	**9.26E-08**
Cadmium[e]	3.98E-07	5.81E-06	5.81E-06	**1.33E-06**
Chromium[e]	8.45E-07	1.23E-05	1.23E-05	8.22E-06
Cobalt[e]	6.02E-06	8.79E-05	8.79E-05	5.86E-05
Copper[e]	1.76E-06	2.57E-05	2.57E-05	1.71E-05
Hexavalent Chromium[e]	2.48E-07	3.62E-06	3.62E-06	**8.26E-07**
Manganese[e]	3.00E-06	4.38E-05	4.38E-05	2.92E-05
Mercury[e]	1.13E-07	1.65E-06	1.65E-06	1.10E-06
Molybdenum[e]	7.87E-07	1.15E-05	1.15E-05	7.66E-06
Nickel[e]	8.45E-05	1.23E-03	1.23E-03	**2.82E-04**
Phosphorus[e]	9.46E-06	1.38E-04	1.38E-04	9.20E-05
Silver[e]				
Selenium[e]	6.83E-07	9.97E-06	9.97E-06	6.65E-06
Thallium[e]				
Vanadium[e]	3.18E-05	4.64E-04	4.64E-04	3.09E-04
Zinc[e]	2.91E-05	4.25E-04	4.25E-04	2.83E-04

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

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: **Aggregate Industries, SWR**
2/23/2011 9:36 **Permit/Facility ID:** **P-2010.Generi 000-00000**

Asphalt Tank Heater - Natural Gas Fired, Estimated Emissions Using AP42 Section 11.1 (Hot Mix Asphalt Plants)

Fuel Type Toggle =	0	
Fuel Consumption Rate	1,961	scf/hr
Max Daily Operation	16	hr/day
Max Annual Operation	2,000	hrs/yr

Note: CO EF per AP-42 Table 1.4.1 for natural gas combustion in boilers is 84 lb/MMscf, a factor of 10 higher than the factor shown in Table 11.1-13
Tank heater CO emissions are based on using 84 lb/MMscf

Pollutant	Emission Factor[a] (lb/scf)	Emissions (lb/hr)	Emissions (T/yr)	TAPs Emissions (lb/hr) Annual or 24-hr Average
PM (total)				
PM-10 (total)				
P.M.-2.5				
CO[c]	8.90E-06	0.00E+00	0.00E+00	
NOx				
SO_2				
VOC				
Lead				
HCl[e]				
Dioxins[e]				
-- No EFs for Natural Gas Fuel --				
Furans[e]				
-- No EFs for Natural Gas Fuel --				
Non-PAH HAPs				
Acetaldehyde[e]				
Acrolein[e]				
Benzene[e]				
1,3-Butadiene[e]				
Ethylbenzene[e]				
Formaldehyde[c,e]	2.60E-08	0.00E+00	0.00E+00	0.00E+00
Hexane[e]				
Isooctane				
Methyl Ethyl Ketone[e]				
Pentane[e]				
Propionaldehyde[e]				
Quinone[e]				
Methyl chloroform[e]				
Toluene[e]				
Xylene[e]				
PAH, Total		0.00E+00		0.00E+00
POM (7-PAH Group)		0.00E+00		0.00E+00

Pollutant	Emission Factor[a] (lb/scf)	Emissions (lb/hr)	Emissions (T/yr)	TAPs Emissions (lb/hr) Annual or 24-hr Average
PAH HAPs				
2-Methylnaphthalene				
3-Methylchloranthrene[e]				
Acenaphthene				
Acenaphthylene				
Anthracene				
Benzo(a)anthracene				
Benzo(a)pyrene[e]				
Benzo(b)fluoranthene				
Benzo(e)pyrene				
Benzo(g,h,i)perylene				
Benzo(k)fluoranthene				
Chrysene				
Dibenzo(a,h)anthracene				
Dichlorobenzene				
Fluoranthene				
Fluorene				
Indeno(1,2,3-cd)pyrene				
Naphthalene[e]				
Perylene				
Phenanthrene				
Pyrene				
Non-HAPs Organic Compounds				
Acetone[e]				
Benzaldehyde				
Butane				
Butyraldehyde				
Crotonaldehyde[e]				
Ethylene				
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
b) (reserved)
c) AP-42, Table 11.1-13, Emission Factors for Hot Mix Asphalt Hot Oil Systems, 3/04
d) (reserved)
e) IDAPA Toxic Air Pollutant

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: **Aggregate Industries, SWR**
2/23/2011 9:36 **Permit/Facility ID: P-2010.Ger 000-00000**

Asphalt Tank Heater - Natural Gas Fired, Estimated Emissions Using AP42 Section 1.4 (Natural Gas Combustion)

Fuel Type Toggle =	0	
Fuel Consumption Rate	1,961	scf/hr
Max Daily Operation	16	hr/day
Max Annual Operation	2,000	hrs/yr
Heating Value Correction:	1.000	applied to Emissions (lb/hr, T/yr) calculations

Note: CO EF per AP-42 Table 1.4.1 for natural gas combustion in boilers is 84 lb/MMscf, a factor of 10 higher than the factor shown in Table 11.1-13
Tank heater CO emissions are based on using 84 lb/MMscf

Pollutant	Emission Factor[a] (lb/MMscf)	Emissions (lb/hr)	Emissions (T/yr)	TAPs Emissions (lb/hr) Annual or 24-hr Average
PM (total)[c]	7.6	0.00E+00	0.00E+00	
PM-10 (total)[c]	7.6	0.00E+00	0.00E+00	
P.M.-2.5				
CO[b]	84	0.00E+00	0.00E+00	
NOx[b]	100	0.00E+00	0.00E+00	
SO_2[c]	0.6	0.00E+00	0.00E+00	
VOC[c]	5.5	0.00E+00	0.00E+00	
Lead[c]	5.00E-04	0.00E+00	0.00E+00	
HCl[e]				
Dioxins[e]				
-- No EFs for Natural Gas Fuel --				
Furans[e]				
-- No EFs for Natural Gas Fuel --				
Non-PAH HAPs[f]				
Acetaldehyde[e]				
Acrolein[e]				
Benzene[c1, e]	2.10E-03	0.00E+00	0.00E+00	**0.00E+00**
1,3-Butadiene[e]				
Ethylbenzene[e]				
Formaldehyde[e]	7.50E-02	0.00E+00	0.00E+00	**0.00E+00**
Hexane[e]	1.80E+00	0.00E+00	0.00E+00	0.00E+00
Isooctane				
Methyl Ethyl Ketone[e]				
Pentane[c1, e]	2.60E+00	0.00E+00	0.00E+00	0.00E+00
Propionaldehyde[e]				
Quinone[e]				
Methyl chloroform[e]				
Toluene[c1, e]	3.40E-03	0.00E+00	0.00E+00	0.00E+00
Xylene[e]				
PAH, Total		0.00E+00		**0.00E+00**
POM (7-PAH Group)		0.00E+00		**0.00E+00**

Pollutant	Emission Factor[a] (lb/MMscf)	Emissions (lb/hr)	Emissions (T/yr)	TAPs Emissions (lb/hr) Annual or 24-hr Average
PAH HAPs[f]				
2-Methylnaphthalene[c1]	2.40E-05	0.00E+00	0.00E+00	**0.00E+00**
3-Methylchloranthrene[c1, e]	1.80E-06	0.00E+00	0.00E+00	**0.00E+00**
Acenaphthene[c1]	1.80E-06	0.00E+00	0.00E+00	**0.00E+00**
Acenaphthylene[c1]	1.80E-06	0.00E+00	0.00E+00	**0.00E+00**
Anthracene[c1]	2.40E-06	0.00E+00	0.00E+00	**0.00E+00**
Benzo(a)anthracene[c1]	1.80E-06	0.00E+00	0.00E+00	**0.00E+00**
Benzo(a)pyrene[c1, e]	1.20E-06	0.00E+00	0.00E+00	**0.00E+00**
Benzo(b)fluoranthenec[1]	1.80E-06	0.00E+00	0.00E+00	**0.00E+00**
Benzo(e)pyrene				
Benzo(g,h,i)perylene[c1]	1.20E-06	0.00E+00	0.00E+00	**0.00E+00**
Benzo(k)fluoranthene[c1]	1.80E-06	0.00E+00	0.00E+00	**0.00E+00**
Chrysene[c1]	1.80E-06	0.00E+00	0.00E+00	**0.00E+00**
Dibenzo(a,h)anthracene[c1]	1.20E-06	0.00E+00	0.00E+00	**0.00E+00**
Dichlorobenzene[c1]	1.20E-03	0.00E+00	0.00E+00	**0.00E+00**
Fluoranthene[c1]	3.00E-06	0.00E+00	0.00E+00	**0.00E+00**
Fluorene[c1]	2.80E-06	0.00E+00	0.00E+00	**0.00E+00**
Indeno(1,2,3-cd)pyrene[c1]	1.80E-06	0.00E+00	0.00E+00	**0.00E+00**
Naphthalene[c1, e]	6.10E-04	0.00E+00	0.00E+00	**0.00E+00**
Perylene				
Phenanthrene[c1]	1.70E-05	0.00E+00	0.00E+00	**0.00E+00**
Pyrene[c1]	5.00E-06	0.00E+00	0.00E+00	**0.00E+00**
Non-HAPs Organic Compounds[f]				
Acetone[e]				
Benzaldehyde				
Butane[c1]	2.10E+00	0.00E+00	0.00E+00	0.00E+00
Butyraldehyde				
Crotonaldehyde[e]				
Ethylene				
Heptane				
Hexanal				
Isovaleraldehyde				
2-Methyl-1-pentene				
2-Methyl-2-butene				
3-Methylpentane				
1-Pentene				
n-Pentane				
Valeraldehyde				
Metals[g]				
Antimony[e]				
Arsenic[d,e]	2.00E-04	0.00E+00	0.00E+00	**0.00E+00**
Barium[d,e]	4.40E-03	0.00E+00	0.00E+00	0.00E+00
Beryllium[e]	1.20E-05	0.00E+00	0.00E+00	**0.00E+00**
Cadmium[d,e]	1.10E-03	0.00E+00	0.00E+00	**0.00E+00**
Chromium[d,e]	1.40E-03	0.00E+00	0.00E+00	0.00E+00
Cobalt[d,e]	8.40E-05	0.00E+00	0.00E+00	0.00E+00
Copper[d,e]	8.50E-04	0.00E+00	0.00E+00	0.00E+00
Hexavalent Chromium[e]				
Manganese[d,e]				
Mercury[d,e]				
Molybdenum[d,e]	1.10E-03	0.00E+00	0.00E+00	0.00E+00
Nickel[d,e]				
Phosphorus[e]				
Silver[e]				
Selenium[d,e]				
Thallium[e]				
Vanadium[d,e]	2.30E-03	0.00E+00	0.00E+00	0.00E+00
Zinc[d,e]				

a) Emission factors are from AP-42
b) AP-42, Table 1.4-1, Emission Factors for NOx and CO from Natural Gas Combustion, 7/98
c) AP-42, Table 1.4-2, Emission Factors for Criteria Pollutants and Greenhouse Gases from Natural Gas Combustion, 7/98
c1) AP-42, Table 1.4-3, Emission Factors for Speciated Organic Compounds from Natural Gas Combustion, 7/98
d) AP-42, Table 1.4-4, Emission Factors for Metals from Natural Gas Combustion, 7/98
e) IDAPA Toxic Air Pollutant

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: Aggregate Industries, SWR
2/23/2011 9:36 Permit/Facility ID: P-2010.Generi 000-00000

EP4a - Silo Filling Operations AP-42 Section 11.1

Emissions Toggle =	1	
Max Hourly Production	425	T/hr
Max Daily Production	3,600	Tons/day
Max Annual Production	150,000	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	0.2490	0.0439	
PM-10 (total)[b]	5.86E-04	0.2490	0.0439	
P.M.-2.5[b]				
CO[b]	1.18E-03	0.5015	0.0885	
NOx				
SO_2				
VOC[d,g]	1.22E-04	5.18E-02	0.0091	
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	1.66E-03	2.92E-04	6.68E-05
1,3-Butadiene[e]				
Ethylbenzene[e]	4.63E-06	1.97E-03	3.47E-04	7.33E-04
Formaldehyde[e]	8.41E-05	3.57E-02	6.31E-03	0.0014
Hexane[e]	1.22E-05	5.18E-03	9.14E-04	1.93E-03
Isooctane	3.78E-08	1.61E-05	2.83E-06	5.98E-06
Methyl Ethyl Ketone[e]	4.75E-06	2.02E-03	3.56E-04	7.53E-04
Pentane[e]				
Propionaldehyde[e]				
Quinone[e]				
Methyl chloroform[e]		0.00E+00	0.00E+00	
Toluene[e]	7.56E-06	3.21E-03	5.67E-04	1.20E-03
Xylene[e]	3.13E-05	1.33E-02	2.35E-03	4.96E-03
PAH, Total		1.23E-02		4.96E-04
POM (7-PAH Group)		2.87E-04		1.16E-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	5.69E-03	1.00E-03	2.29E-04
3-Methylchloranthrene[e]				
Acenaphthene	1.19E-06	5.07E-04	8.95E-05	2.04E-05
Acenaphthylene	3.55E-08	1.51E-05	2.67E-06	6.09E-07
Anthracene	3.30E-07	1.40E-04	2.48E-05	5.65E-06
Benzo(a)anthracene	1.42E-07	6.04E-05	1.07E-05	2.43E-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	1.03E-05	1.81E-06	4.13E-07
Benzo(g,h,l)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	2.27E-04	4.00E-05	9.13E-06
Dibenzo(a,h)anthracene	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Dichlorobenzene				
Fluoranthene	3.81E-07	1.62E-04	2.86E-05	6.52E-06
Fluorene	2.56E-06	1.09E-03	1.92E-04	4.39E-05
Indeno(1,2,3-cd)pyrene	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Naphthalene[e]	4.62E-06	1.96E-03	3.47E-04	7.91E-05
Perylene	7.62E-08	3.24E-05	5.71E-06	1.30E-06
Phenanthrene	4.57E-06	1.94E-03	3.43E-04	7.83E-05
Pyrene	1.12E-06	4.75E-04	8.38E-05	1.91E-05
Non-HAP Organic Compounds				
Acetone[e]	6.70E-06	2.85E-03	5.03E-04	1.06E-03
Benzaldehyde				
Butane				
Butyraldehyde				
Crotonaldehyde[e]				
Ethylene	1.34E-04	5.70E-02	1.01E-02	2.12E-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

		LOADOUT	SILO FILL	
Total PM EF = $0.000181+0.00141(-V)e^{((0.0251)(T+460)-20.43)}$ + $000332+0.00105(-V)e^{((0.0251)(T+460)-2}$	=	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: Aggregate Industries, SWR
2/23/2011 9:36 Permit/Facility ID: P-2010.Generi 000-00000

Silo Filling Operations AP-42 Section 11.1, Page 2

Fuel Type Toggle =	1	
Max Hourly Production	425	T/hr
Max Daily Production	3,800	Tons/day
Max Annual Production	150,000	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[c]				
Bromomethane[e]	5.97E-07	2.54E-04	0.0000	9.45E-05
2-Butanone (see Methyl Ethyl Ketone)				
Carbon disulfide[e]	1.95E-06	8.29E-04	0.0001	3.09E-04
Chloroethane (Ethyl chloride[e])	4.87E-07	2.07E-04	0.0000	7.72E-05
Chloromethane (Methyl chloride[e])	2.80E-06	1.19E-03	0.0002	4.44E-04
Cumene[e]				
n-Hexane (see Hexane[e])				
Methylene chloride (Dichloromethane[e])	3.29E-08	1.40E-05	2.47E-06	5.21E-06
MTBE				
Styrene[e]	6.58E-07	2.80E-04	4.94E-05	1.04E-04
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	1.04E-02	0.0018	3.86E-03
o-Xylene[e] (added into Xylene[e])	6.95E-06	2.95E-03	0.0005	1.10E-03
Phenol[e,f]				
Non-HAP Organic Compounds				
Methane	3.17E-03	1.35E+00	0.2376	5.02E-01

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

Facility: Aggregate Industries, SWR
2/23/2011 9:36 Permit/Facility ID: P-2010.Generi 000-00000

EP4b - Load-out Operations AP-42 Section 11.1

Emissions Toggle =	1	
Max Hourly Production	425	T/hr
Max Daily Production	3,800	Tons/day
Max Annual Production	150,000	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	0.222	0.04	
PM-10 (total)[b]	5.22E-04	0.222	0.04	
P.M.-2.5[b]				
CO[b]	1.35E-03	0.573	0.10	
NOx				
SO_2				
VOC[d,g]	3.91E-03	1.661	0.29	
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	9.19E-04	1.62E-04	**3.70E-05**
1,3-Butadiene[e]				
Ethylbenzene[e]	1.16E-05	4.95E-03	8.73E-04	1.84E-03
Formaldehyde[e]	3.66E-06	1.56E-03	2.74E-04	**6.27E-05**
Hexane[e]	6.24E-06	2.65E-03	4.68E-04	9.88E-04
Isooctane	7.49E-08	3.18E-05	5.61E-06	1.19E-05
Methyl Ethyl Ketone[e]	2.04E-06	8.66E-04	1.53E-04	3.23E-04
Pentane[e]				
Propionaldehyde[e]				
Quinone[e]				
Methyl chloroform[e]				
Toluene[e]	8.73E-06	3.71E-03	6.55E-04	1.38E-03
Xylene[e]	5.03E-05	2.14E-02	3.77E-03	7.97E-03
PAH, Total		8.60E-03		**3.46E-04**
POM (7-PAH Group)		1.96E-04		**7.88E-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	3.45E-03	6.09E-04	**1.39E-04**
3-Methylchloranthrene[e]				
Acenaphthene	8.86E-07	3.77E-04	6.65E-05	**1.52E-05**
Acenaphthylene	9.55E-08	4.06E-05	7.16E-06	**1.63E-06**
Anthracene	2.39E-07	1.01E-04	1.79E-05	**4.09E-06**
Benzo(a)anthracene	6.48E-08	2.75E-05	4.86E-06	**1.11E-06**
Benzo(a)pyrene[e]	7.84E-09	3.33E-06	5.88E-07	**1.34E-07**
Benzo(b)fluoranthene	2.59E-08	1.10E-05	1.94E-06	**4.44E-07**
Benzo(e)pyrene	2.66E-08	1.13E-05	1.99E-06	**4.55E-07**
Benzo(g,h,i)perylene	6.48E-09	2.75E-06	4.86E-07	**1.11E-07**
Benzo(k)fluoranthene	7.50E-09	3.19E-06	5.63E-07	**1.28E-07**
Chrysene	3.51E-07	1.49E-04	2.63E-05	**6.01E-06**
Dibenzo(a,h)anthracene	1.26E-09	5.36E-07	9.46E-08	**2.16E-08**
Dichlorobenzene				
Fluoranthene	1.70E-07	7.24E-05	1.28E-05	**2.92E-06**
Fluorene	2.63E-06	1.12E-03	1.97E-04	**4.50E-05**
Indeno(1,2,3-cd)pyrene	1.60E-09	6.81E-07	1.20E-07	**2.74E-08**
Naphthalene[e]	4.26E-06	1.81E-03	3.20E-04	**7.30E-05**
Perylene	7.50E-08	3.19E-05	5.63E-06	**1.28E-06**
Phenanthrene	2.76E-06	1.17E-03	2.07E-04	**4.73E-05**
Pyrene	5.11E-07	2.17E-04	3.84E-05	**8.76E-06**
Non-HAP Organic Compounds				
Acetone[e]	1.95E-06	8.27E-04	1.46E-04	3.08E-04
Benzaldehyde				
Butane				
Butyraldehyde				
Crotonaldehyde[e]				
Ethylene	2.95E-05	1.25E-02	2.21E-03	4.68E-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 (°F) = 325

Equation		LOADOUT	SILO FILL	
Total PM EF = $0.000181+0.00141(-V)e^{((0.0251)(T+460)-20.43)}$ + $000332+0.00105(-V)e^{((0.0251)(T+460)-2}$	=	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: Aggregate Industries, SWR

2/23/2011 9:36 Permit/Facility ID: P-2010.Generic 000-00000

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

Fuel Type Toggle =	1	
Max Hourly Production	425	T/hr
Max Daily Production	3,800	Tons/day
Max Annual Production	150,000	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	1.70E-04	2.99E-05	6.32E-05
2-Butanone (see Methyl Ethyl Ketone)				
Carbon disulfide[e]	5.41E-07	2.30E-04	4.05E-05	8.56E-05
Chloroethane (Ethyl chloride[e])	8.73E-09	3.71E-06	6.55E-07	1.38E-06
Chloromethane (Methyl chloride[e])	6.24E-07	2.65E-04	4.68E-05	9.88E-05
Cumene[e]	4.57E-06	1.94E-03	3.43E-04	7.24E-04
n-Hexane (see Hexane[e])				
Methylene chloride (Dichloromethane[e])				
MTBE				
Styrene[e]	3.04E-07	1.29E-04	2.28E-05	4.81E-05
Tetrachloroethene (Tetrachloroethylene[e])	3.20E-07	1.36E-04	2.40E-05	5.07E-05
1,1,1-Trichloroethane (Methyl chloroform[e])				
Trichloroethene (Trichloroethylene[e])				
Trichlorofluoromethane	5.41E-08	2.30E-05	4.05E-06	8.56E-06
m-/p-Xylene[e] (added into Xylene[e])	1.71E-05	7.25E-03	1.28E-03	2.70E-03
o-Xylene[e] (added into Xylene[e])	3.33E-05	1.41E-02	2.50E-03	5.27E-03
Phenol[e,f]	4.02E-06	1.71E-03	3.02E-04	6.37E-04
Non-HAP Organic Compounds				
Methane	2.70E-04	1.15E-01	2.03E-02	4.28E-02

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

Facility:	**Aggregate Industries, SWR**		15 % of 96% RAP is Used	**61 T/hr**
2/23/2011 9:36	**Permit/Facility ID:**	**P-2010.Generic 000-00000**		**547 T/day**
				21,600 T/yr
Max Hourly Production	425 T/hr		96% T/hr is Aggregate & RAP =	**408 T/hr**
Max Daily Production	3,800 Tons/day		96% T/day is Aggregate & RAP =	**3,648 T/day**
Max Annual Production	150,000 Tons/yr		96% T/yr is Aggregate & RAP =	**144,000 T/yr**

Fine PM emitted from RAP use is negligible (see assumptions on page 1 of this spreadsheet). Worst case emissions are for 0% RAP

Aggregate Front-end Loader Drop Points, AP-42 13.2.4 (11/06)

$E = k (0.0032) \times (U/5)^{1.3} / (M/2)^{1.4}$ = 3.31E-03   1.56E-03 lb/ton for PM10   2.37E-04 lb/ton for PM2.5

k = particle size multiplier: 0.74 for PM; 0.35 for PM10; 0.053 for PM2.5

U = mean wind speed = **10 mph**   Wind speed range for source conditions for Equation 1: 1.3 to 15 mph. Select 10 mph as base case wind speed.

M = moisture content = **3 %**

Moisture Content: 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: Aggregate moisture content into dryer typically 3 to 7 %

BAAQMD, Hot Mixing Asphalt Facilities, Engineering Evaluation Template, www.baaqmd.gov/pmt/handbook/s11c02ev.htm: Bulk aggregate moisture content typically stabilizes between 3 and 5% by weight.

Windspeed Variation Factors for AERMOD modeling:				PM10		PM2.5	
Wind Category	Upper windspeed (m/sec)	Avg windspeed (m/sec)	Avg windspeed (mph)	E @ avg mph	F = Eavg mph/ E@10mph	E @ avg mph	F = Eavg mph/ E@10mph
Cat 1:	1.54	0.77	1.72	1.59E-04	0.1016	2.41E-05	0.1016
Cat 2:	3.09	2.32	5.18	6.65E-04	0.4251	1.01E-04	0.4251
Cat 3:	5.14	4.12	9.20	1.40E-03	0.8979	2.13E-04	0.8979
Cat 4:	8.23	6.69	14.95	2.64E-03	1.687	3.99E-04	1.687
Cat 5:	10.80	9.52	21.28	4.17E-03	2.670	6.32E-04	2.670
Cat 6:	14.00	12.40	27.74	5.89E-03	3.767	8.92E-04	3.767

EP1a - Aggregate Front End Loader Drop Points

Drop to storage pile and drop to bins: **408 T/hr**   **2** Transfer Points

Pollutant	Emission Factor (lb/ton)	Emissions Per Transfer Point				Total Emissions			
		Emissions (lb/hr) 1-hr Average	Emissions (lb/hr) 24-hr Average	Emissions (T/yr)	Emissions (lb/hr) Annual Average	Emissions (lb/hr) 1-hr Average	Emissions (lb/hr) 24-hr Average	Emissions (T/yr)	Emissions (lb/hr) Annual Average
PM (total)	3.31E-03	1.35	0.50	0.24	0.05	2.70	1.00	0.48	0.11
PM-10 (total)	1.56E-03	0.64	0.24	0.11	0.03	1.28	0.48	0.23	0.05
P.M.-2.5	2.37E-04	0.10	0.04	0.02	0.00	0.19	0.07	0.03	0.01

Conveyor and Scalping Screen Emission Points

Moisture/Control %:

AP-42 Table 11.19.2-2, Note b. Moisture content of uncontrolled sources ranged from 0.21 to 1.3%

AP-42 Table 11.19.2-2, Note b. Moisture content of controlled (water spray) sources ranged from 0.55 to 2.88% --> ~91.3% control for screening, ~95% control for conveyor transfer

Bulk aggregate for HMA plants typically stabilizes between 3 and 5% by weight--> Apply additional **10%** control to lb/hr, etc. for the higher moisture.

EP1 Aggregate Collecting Conveyors and Xfrs to Screen

408 T/hr   **2** Transfer Points

Pollutant	Emission Factor Table 11.19.2-2 CONVEYOR TRANSFER PT CONTROLLED (lb/ton)	Emissions Per Transfer Point				Total Emissions			
		Emissions (lb/hr) 1-hr Average	Emissions (lb/hr) 24-hr Average	Emissions (T/yr)	Emissions (lb/hr) Annual Average	Emissions (lb/hr) 1-hr Average	Emissions (lb/hr) 24-hr Average	Emissions (T/yr)	Emissions (lb/hr) Annual Average
PM (total)	0.00014	5.14E-02	1.92E-02	9.07E-03	2.07E-03	1.03E-01	3.83E-02	1.81E-02	4.14E-03
PM-10 (total)	4.60E-05	1.69E-02	6.29E-03	2.98E-03	6.81E-04	3.38E-02	1.26E-02	5.96E-03	1.36E-03
P.M.-2.5	1.30E-05	4.77E-03	1.78E-03	8.42E-04	1.92E-04	9.55E-03	3.56E-03	1.68E-03	3.85E-04

EP2 - Aggregate Scalping Screen, AP-42 11.19 (8/04)

Aggregate flow across scalping screen onto conveyor: **408 T/hr**

Pollutant	Emission Factor Table 11.19.2-2 SCREENING CONTROLLED (lb/ton)	Emissions (lb/hr) 1-hr Average	Emissions (lb/hr) 24-hr Average	Emissions (T/yr)	Emissions (lb/hr) Annual Average
PM (total)	0.0022	0.808	0.301	0.143	0.033
PM-10 (total)	0.00074	0.272	0.101	0.048	0.011
P.M.-2.5	5.00E-05	0.018	0.007	0.003	0.001

EP3 - Aggregate Conveyors From Scalper Screen to Drum Mixer

Aggregate transfer from conveyor to drum dryer (2 transfer point): **408 T/hr**

Pollutant	Emission Factor Table 11.19.2-2 CONVEYOR TRANSFER PT CONTROLLED (lb/ton)	Emissions Per Transfer Point				Total Emissions			
		Emissions (lb/hr) 1-hr Average	Emissions (lb/hr) 24-hr Average	Emissions (T/yr)	Emissions (lb/hr) Annual Average	Emissions (lb/hr) 1-hr Average	Emissions (lb/hr) 24-hr Average	Emissions (T/yr)	Emissions (lb/hr) Annual Average
PM (total)	0.00014	0.051	0.019	9.07E-03	2.07E-03	1.03E-01	3.83E-02	1.81E-02	4.14E-03
PM-10 (total)	4.60E-05	0.017	0.006	2.98E-03	6.81E-04	3.38E-02	1.26E-02	5.96E-03	1.36E-03
P.M.-2.5	1.30E-05	0.005	0.002	8.42E-04	1.92E-04	9.55E-03	3.56E-03	1.68E-03	3.85E-04

Facility: Aggregate Industries, SWR

2/23/2011 9:36 Permit/Facility ID: P-2010.Generic 000-00000

CRITERIA POLLUTANT MODELING

POUNDS PER HOUR

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

A. Drum Mix Plant: 425 Tons/hour 353 Hours/year 150,000 Tons/year 3,800 Tons/day 8.9 hr/day 353 hr/yr

Maximum emission for each pollutant from any fuel-burning options selected on "Facility Data" worksheet. Fuels Selected = #2 Fuel Oil 0.5000% S | Used Oil 0.5000% S

B. Tank Heater: 2.0000 MMBtu Rate 2,000 Hours/year 16 hrs/day

Maximum emission for each pollutant for heater burning any fuel selected on "Facility Data" worksheet. Fuels Selected = 0.0015% S #2 Fuel Oil

C1. Engine: 4.39319857 gal/hour 2000 Hours/year Engine < 25hp 0.0015% S #2 Fuel Oil 12 hrs/day

C2. Engine: 51.08 gal/hour 1000 Hours/year Engine > 25hp 0.0015% S #2 Fuel Oil 12 hrs/day

Max 1-hour, 3-hour, and 8-hour averages: permit emissions (HMA/silos/loadout: max hourly HMA prodution, tank heater/engines: actual hours)

Pollutant	A Drum Mix Max Emission Rate for Pollutant (lb/hr)	B Asphalt Tank Heater Max Emission Rate for Pollutant (lb/hr)	C1 E1< 175 hp Engine Max Emission Rate for Pollutant (lb/hr) Tier 2 Engine	C2 E2 > 175hp Engine Max Emission Rate for Pollutant (lb/hr) Tier 2 Engine	D1 Silo Filling Emission Rate for Pollutant (lb/hr)	D2 Load-out Emission Rate for Pollutant (lb/hr)	See Scalping Scrn & Transfer Points" worksheet for 1-hour, 24-hour, and annual PM10 emission rates from those sources.
PM (total)			1.89E-01	0.7			
PM-10 (total)	9.78	4.82E-02	1.89E-01	0.700	2.49E-01	2.22E-01	
P.M.-2.5							
CO	55.25	7.30E-02	5.74E-01	5.50	5.01E-01	5.73E-01	
NOx	23.38	2.92E-01	2.67E+00	24.00			
SO_2	24.65	0.003	1.76E-01	1.20E-02			
VOC	13.60	8.12E-03	2.12E-01	7.00E-01	5.18E-02	1.66E+00	
Lead	6.38E-03	2.20E-05					

Max 24-hour averages: (permit emissions) * [HMA/silo/load-out ((daily max T/D) / (hourly max T/hr)) / (24 hr/day)] or [tank htr (8hrs actual/24 hrs)] or engines at (24/24) hrs/day]

Pollutant	A Drum Mix Max Emission Rate for Pollutant (lb/hr)	B Asphalt Tank Heater Max Emission Rate for Pollutant (lb/hr)	C1 E1<175 hp Engine Max Emission Rate for Pollutant (lb/hr)	C2 E2 > 175 hp Engine 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)	See Scalping Scrn & Transfer Points" worksheet for 1-hour, 24-hour, and annual PM10 emission rates from those sources.
PM (total)							
PM-10 (total)	3.64	3.21E-02	1.10E-03	0.00E+00	9.28E-02	8.26E-02	
P.M.-2.5							
CO							
NOx							
SO_2	9.18	2.07E-03	8.82E-02	6.00E-03			
VOC							
Lead							

Max Annual averages: (permit emissions) * {HMA and loadout [(daily max T/D)/(hourly max T/hr)]/8760 hrs/yr} OR {silo [(max tons/year) / 8760 hr/yr]} OR {htr/engines at input hrs/yr / 8760 }

Pollutant	A Drum Mix Max Emission Rate for Pollutant (lb/hr)	B Asphalt Tank Heater Max Emission Rate for Pollutant (lb/hr)	C1 E1< 175 hp Engine Max Emission Rate for Pollutant (lb/hr)	C2 E2 > 175 hp Engine 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)	See Scalping Scrn & Transfer Points" worksheet for 1-hour, 24-hour, and annual PM10 emission rates from those sources.
PM (total)							
PM-10 (total)	0.39	1.10E-02	5.02E-04	0.00E+00	1.00E-02	8.94E-03	
P.M.-2.5							
CO							
NOx	0.94	6.66E-02	7.08E-03	0.00E+00			
SO_2	0.99	7.10E-04	4.03E-02	1.37E-03			
VOC							
Lead							

Facility:	Aggregate Industries, SWR		
2/23/2011 9:36	Permit/Facility ID:	P-2010.Generic	000-00000

TAPs MODELING
POUNDS PER HOUR

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

A. Drum Mix Plant: 425 Tons/hour 353 Hours/year 150,000 Tons/year 3,800 Tons/day
Maximum emission for each pollutant from any fuel-burning options selected on "Facility Data" worksheet. Fuels Selected = #2 Fuel Oil Used Oil
B. Tank Heater: 2.0000 MMBtu Rat 2,000 Hours/year 16 hrs/day
Maximum emission for each pollutant for heater burning any fuel selected on "Facility Data" worksheet. Fuels Selected = #2 Fuel Oil
C. E2 Engine: 51.0837043 gal/hour 1000 Hours/year Engine > 25bhp #2 Fuel Oil 12 hrs/day

Pollutant	A Drum Mix Max Emission Rate for Pollutant (lb/hr)	B Asphalt Tank Heater Max Emission Rate for Pollutant (lb/hr)	C E1 + E2 Engine 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)					
P.M.-2.5					
CO					
NOx					
SO_2					
VOC					
Lead					
HCl[e]	8.93E-02	0.00E+00			
Dioxins[e]					
2,3,7,8-TCDD	8.93E-11				
Total TCDD	3.95E-10				
1,2,3,7,8-PeCDD	1.32E-10				
Total PeCDD	9.35E-09				
1,2,3,4,7,8-HxCDD	1.79E-10	1.01E-11			
1,2,3,6,7,8-HxCDD	5.53E-10				
1,2,3,7,8,9-HxCDD	4.17E-10	1.11E-11			
Total HxCDD	5.10E-09				
1,2,3,4,6,7,8-Hp-CDD	2.04E-09	2.19E-10			
Total HpCDD	3.25E-10	2.92E-10			
Octa CDD	4.28E-10	5.33E-10			
Total PCDD[h]	1.35E-09	6.66E-10			
Furans[e]					
2,3,7,8-TCDF	1.66E-11				
Total TCDF	6.34E-11	1.10E-11			
1,2,3,7,8-PeCDF	7.36E-11				
2,3,4,7,8-PeCDF	1.44E-11				
Total PeCDF	1.44E-09	1.60E-12			
1,2,3,4,7,8-HxCDF	6.85E-11				
1,2,3,6,7,8-HxCDF	2.05E-11				
2,3,4,6,7,8-HxCDF	3.25E-11				
1,2,3,7,8,9-HxCDF	1.44E-10				
Total HxCDF	2.23E-10	6.66E-12			
1,2,3,4,6,7,8-HpCDF	1.11E-10				
1,2,3,4,7,8,9-HpCDF	4.62E-11				
Total HpCDF	1.71E-10	3.23E-11			
Octa CDF	8.22E-11	4.00E-11			
Total PCDF[h]	6.85E-10	1.03E-10			
Total PCDD/PCDF[h]	2.05E-09	7.66E-10			
Non-PAH HAPs					
Acetaldehyde[e]	2.23E-02		1.26E-04		
Acrolein[e]	4.12E-03		2.78E-05		
Benzene[e]	**6.68E-03**	**0.00E+00**	**7.48E-04**	**6.68E-05**	**3.70E-05**
1,3-Butadiene[e]			**5.37E-06**		
Ethylbenzene[e]	3.80E-02			7.33E-04	1.84E-03
Formaldehyde[e]	**5.31E-02**	**1.17E-05**	**2.25E-04**	**1.44E-03**	**6.27E-05**
Hexane[e]	1.46E-01	0.00E+00		1.93E-03	9.88E-04
Isooctane	6.33E-03			5.98E-06	1.19E-05
Methyl Ethyl Ketone[e]	3.17E-03			7.53E-04	3.23E-04
Pentane[e]		0.00E+00			
Propionaldehyde[e]	2.06E-02				
Quinone[e]	2.53E-02				
Methyl chloroform[e]	7.60E-03				
Toluene[e]	4.59E-01	0.00E+00	1.11E-03	1.20E-03	1.38E-03
Xylene[e]	3.17E-02		7.61E-04	4.96E-03	7.97E-03
PolycyclicOrganic Matter[d,e]	**9.38E-06**	**3.33E-07**	**4.07E-06**	**1.16E-05**	**7.88E-06**
TOTAL PAH HAPs	**1.52E-02**	**7.67E-05**	**1.92E-04**	**4.96E-04**	**3.46E-04**

Pollutant	A Drum Mix Max Emission Rate for Pollutant (lb/hr)	B Asphalt Tank Heater Max Emission Rate for Pollutant (lb/hr)	C E1 + E2 Engine Max Emission Rate for Pollutant (lb/hr)	D Silo Filling Emission Rate for Pollutant (lb/hr)	D2 Load-out Emission Rate for Pollutant (lb/hr)
PAH HAPs					
2-Methylnaphthalene	2.91E-03	0.00E+00	0.00E+00	2.29E-04	1.39E-04
3-Methylchloranthrene[e]	0.00E+00	0.00E+00	0.00E+00		
Acenaphthene	2.40E-05	1.77E-06	3.93E-06	2.04E-05	1.52E-05
Acenaphthylene	3.77E-04	6.66E-07	8.07E-06	6.09E-07	1.63E-06
Anthracene	5.31E-05	6.00E-07	1.24E-06	5.65E-06	4.09E-06
Benzo(a)anthracene[e]	3.60E-06	0.00E+00	7.28E-07	2.43E-06	1.11E-06
Benzo(a)pyrene[e]	1.68E-07	0.00E+00	2.31E-07	0.00E+00	1.34E-07
Benzo(b)fluoranthene[e]	1.71E-06	3.33E-07	9.01E-07	0.00E+00	4.44E-07
Benzo(e)pyrene	1.88E-06	0.00E+00	0.00E+00	4.13E-07	4.55E-07
Benzo(g,h,i)perylene	6.85E-07	0.00E+00	5.12E-07	0.00E+00	1.11E-07
Benzo(k)fluoranthene[e]	7.02E-07	0.00E+00	1.96E-07	0.00E+00	1.28E-07
Chrysene[e]	3.08E-06	0.00E+00	1.27E-06	9.13E-06	6.01E-06
Dibenzo(a,h)anthracene[e]	0.00E+00	0.00E+00	3.57E-07	0.00E+00	2.16E-08
Dichlorobenzene	0.00E+00	0.00E+00	0.00E+00		
Fluoranthene	1.04E-05	1.47E-07	4.27E-06	6.52E-06	2.92E-06
Fluorene	1.88E-04	1.07E-07	1.42E-05	4.39E-05	4.50E-05
Indeno(1,2,3-cd)pyrene[e]	1.20E-07	0.00E+00	3.82E-07	0.00E+00	2.74E-08
Naphthalene[e]	1.11E-02	5.66E-05	1.16E-04	7.91E-05	7.30E-05
Perylene	1.51E-07	0.00E+00	0.00E+00	1.30E-06	1.28E-06
Phenanthrene	3.94E-04	1.63E-05	3.66E-05	7.83E-05	4.73E-05
Pyrene	5.14E-05	1.07E-07	3.62E-06	1.91E-05	8.76E-06
Non-HAP Organic Compounds					
Acetone[e]	1.31E-01	0.00E+00		1.06E-03	3.08E-04
Benzaldehyde	1.74E-02	0.00E+00			
Butane	1.06E-01	0.00E+00			
Butyraldehyde	2.53E-02	0.00E+00			
Crotonaldehyde[e]	1.36E-02	0.00E+00			
Ethylene	1.11E+00	0.00E+00		2.12E-02	4.68E-03
Heptane	1.49E+00	0.00E+00			
Hexanal	1.74E-02	0.00E+00			
Isovaleraldehyde	5.07E-03	0.00E+00			
2-Methyl-1-pentene	6.33E-01	0.00E+00			
2-Methyl-2-butene	9.18E-02	0.00E+00			
3-Methylpentane	3.01E-02	0.00E+00			
1-Pentene	3.48E-01	0.00E+00			
n-Pentane	3.33E-02	0.00E+00			
Valeraldehyde[e]	1.06E-02	0.00E+00			
Metals					
Antimony[e]	2.85E-05	5.11E-05			
Arsenic[e]	**9.59E-06**	**4.40E-06**			
Barium[e]	9.18E-04	2.50E-05			
Beryllium[e]	**0.00E+00**	**9.26E-08**			
Cadmium[e]	**7.02E-06**	**1.33E-06**			
Chromium[e]	8.71E-04	8.22E-06			
Cobalt[e]	4.12E-06	5.86E-05			
Copper[e]	4.91E-04	1.71E-05			
Hexavalent Chromium[e]	**7.71E-06**	**8.26E-07**			
Manganese[e]	1.22E-03	2.92E-05			
Mercury[e]	4.12E-04	1.10E-06			
Molybdenum[e]	0.00E+00	7.66E-06			
Nickel[e]	**1.08E-03**	**2.82E-04**			
Phosphorus[e]	4.43E-03	9.20E-05			
Silver[e]	7.60E-05	0.00E+00			
Selenium[e]	5.54E-05	6.65E-06			
Thallium[e]	6.49E-07	0.00E+00			
Vanadium[e]	0.00E+00	3.09E-04			
Zinc[e]	9.66E-03	2.83E-04			

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

APPENDIX B – AMBIENT AIR QUALITY IMPACT ANALYSES

MEMORANDUM

DATE: February 18, 2010

TO: Darrin Pampaian, Air Program

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

PROJECT: P-2010.0154 PROJ 60625 PTC Application for the Aggregate Industries Portable Hot Mix Asphalt Plant

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

1.0 Summary

Aggregate Industries, SWR (Aggregate Industries) submitted a Permit to Construct (PTC) application for a portable hot mix asphalt (HMA) plant to be operated in Idaho. Non-site-specific air quality impact analyses involving atmospheric dispersion modeling of emissions associated with the HMA plant were performed by DEQ to demonstrate that the facility would not cause or significantly contribute to a violation of any ambient air quality standard (IDAPA 58.01.01.203.02 and 203.03 [Idaho Air Rules Section 203.02 and 203.03]). Aggregate Industries submitted applicable information and data enabling DEQ to perform non-site-specific ambient impact analyses.

DEQ performed non-site-specific air quality impact analyses to assure compliance with air quality standards for the Aggregate Industries HMA plant. Results from DEQ's atmospheric dispersion modeling were used to establish minimum setback distances between emissions points and the property boundary of the site. The submitted information, in combination with DEQ's air quality analyses: 1) utilized appropriate methods and models; 2) was conducted using reasonably accurate or conservative model parameters and input data; 3) adhered to established DEQ guidelines for new source review dispersion modeling; 4) showed that predicted pollutant concentrations from emissions associated with the facility, when appropriately combined with background concentrations, were below applicable air quality standards at all locations outside of the required setback distance (closest distance from pollutant emissions points to the property boundary). Table 1 presents key assumptions and results to be considered in the development of the permit.

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

Table 1. KEY CONDITIONS USED IN MODELING ANALYSES	
Criteria/Assumption/Result	**Explanation/Consideration**
Maximum HMA throughput does not exceed 480 ton HMA/hour, 3,800 ton HMA/day, and 150,000 ton HMA/year.	Short-term and annual modeling was performed assuming these rates.
Emissions from the drum dryer were based on the maximum emissions from using either natural gas, diesel, or used oil to fuel the dryer.	Compliance was demonstrated for any of the listed fuels.
A minimum distance of 87 meters (285 feet), 64 meters (210 feet) when not operating any generators, is maintained between the property boundary and any emissions points other than storage piles and roadways.	This setback distance is necessary to assure compliance with applicable air quality standards at all ambient air locations.
HMA production is half the stated value for the winter season (December 1 through March 31).	Substantially greater setback distances would be needed if full production was assumed for the winter season.
The HMA plant will not locate to a site where there are co-contributing emissions sources such as other HMA plants, concrete batch plants, or rock crushing plants within 1,000 feet of emissions points, except as noted below for a rock crushing plant. However, NAAQS compliance is assured for the HMA plant with a co-contributing rock crushing plant, provided it is not operated during any day when the HMA plant is operated and the annual throughput of the rock crushing plant is less than 500,000 ton/year.	Emissions are considered co-contributing if they occur within 1,000 feet (305 meters) of each other. Once the HMA plant is established at a specific site, that facility is not responsible for controlling other facilities from moving in nearby, provided they are not on the same property. Neighboring facilities would be required to account for the HMA impacts for their permitting analyses.
DEQ Modeling staff contend that NAAQS compliance is assured for the HMA plant operating simultaneously (both within a given day) with a crushing plant, provided HMA daily throughput for that day is limited to half that normally allowed.	Decreased HMA throughput will offset potential impacts of a nearby crushing plant.
Large diesel engines powering generators (powered by engines rated at >175 bph): have a combined power rating of less than 1,475 bhp; operate up to 12 hour/day, 4,380 hour/year. Note: The Applicant has requested an annual limit for this IC engine of 1,000 hours per year. Therefore, this limit will be placed in the permit.	Different combinations can be used if it is demonstrated that total emissions from generators are less than those modeled for these sources.
Small diesel engines powering generators (powered by engines rated at <175 bhp): have a combined power rating of less than 102 bhp; operate up to 24 hour/day, 4,380 hour/year. Note: The Applicant has requested an annual limit for this IC engine of 2,000 hours per year. Therefore, this limit will be placed in the permit.	Different combinations can be used if it is demonstrated that total emissions from generators are less than those modeled for these sources.
Fugitive emissions from material handling and vehicle traffic are controlled to a high degree.	Control of conveyor transfers and screening are equivalent to that achieved by a water spray.
The HMA plant is not located in any non-attainment areas.	All analyses performed assumed the facility will be located in areas attaining air quality standards.
Emissions rates for applicable averaging periods are not greater than those used in the modeling analyses, as listed in this memorandum.	Greater emissions quantities would result in larger setback distances.
Stack heights for the drum dryer, tank heater, and generator are as listed in this memorandum or higher.	NAAQS compliance is still assured if actual stack heights are greater than those listed in this memo.
NAAQS compliance is assured provided stack parameters of exhaust temperature and flow rate are not less than about 75 percent of values listed in this memorandum.	Higher temperatures and flow rates increase plume rise, allowing the plume to disperse to a larger degree before impacting ground level.
T-RACT is used for all TAP emissions sources except diesel engines (which are not applicable for those TAPs modeled, since they are subject to 40 CFR 63.ZZZZ)	Setback distances would be substantially greater if DEQ does not concur that T-RACT was used to control TAP emissions.

2.0 Background Information

2.1 Applicable Air Quality Impact Limits and Modeling Requirements

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

2.1.1 Area Classification

The HMA plant will be a portable facility. The HMA plant will only locate in areas designated as attainment or unclassifiable for all criteria pollutants.

2.1.2 Significant and Cumulative NAAQS Impact Analyses

If estimated maximum pollutant impacts to ambient air from the emissions sources associated with the proposed facility exceed the significant impact levels (SILs) of Idaho Air Rules Section 006.105 (referred to as a significant contribution in Idaho Air Rules), then a cumulative NAAQS impact analysis is necessary to demonstrate compliance with National Ambient Air Quality Standards (NAAQS) and Idaho Air Rules Section 203.02. A cumulative NAAQS impact analysis for attainment area pollutants involves adding ambient impacts from facility-wide emissions, and emissions from any nearby co-contributing sources, to DEQ-approved background concentration values that are appropriate for the criteria pollutant/averaging-time at the facility location and the area of significant impact. The resulting maximum pollutant concentrations in ambient air are then compared to the NAAQS listed in Table 2. Table 2 also lists SILs and specifies the modeled value that must be used for comparison to the NAAQS.

New source review requirements for assuring compliance with $PM_{2.5}$ standards have not yet been completed and promulgated into regulation. EPA has asserted through a policy memorandum (October 23, 1997) that compliance with $PM_{2.5}$ standards will be assured through an air quality analysis for the corresponding PM_{10} standard. DEQ allows a direct surrogate use of PM_{10} modeling results rather than the adjustments and justifications for surrogate use as suggested by the EPA March 23, 2010, Page Memo (Memorandum from Stephan Page, Director of Office of Air Quality Planning and Standards, EPA, *Modeling Procedures for Demonstrating Compliance with $PM_{2.5}$ NAAQS*, March 23, 2010). Although the PM_{10} annual standard was revoked in 2006, compliance with the revoked PM_{10} annual standard must be demonstrated as a surrogate to the annual $PM_{2.5}$ standard. Once $PM_{2.5}$ is directly incorporated into permitting procedures, this memorandum will no longer be considered as a satisfactory demonstration of $PM_{2.5}$ NAAQS compliance.

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

DEQ used non-site-specific cumulative impact analyses to demonstrate compliance with Idaho Air Rules Section 203.02. Established setback distances are minimal distances between any emissions points and the ambient air boundary (usually the property boundary) needed to assure compliance with standards, considering the impact of the HMA plant and a conservative background value.

Table 2. APPLICABLE REGULATORY LIMITS				
Pollutant	**Averaging Period**	**Significant Impact Levels[a] (µg/m³)[b]**	**Regulatory Limit[c] (µg/m³)**	**Modeled Value Used[d]**
PM_{10}[e]	Annual[f]	1.0	50[g]	Maximum 1st highest[h]
	24-hour	5.0	150[i]	Maximum 6th highest[j]
$PM_{2.5}$[k]	Annual	0.3	15[l]	Use PM_{10} as surrogate
	24-hour	1.2	35[m]	Use PM_{10} as surrogate
Carbon monoxide (CO)	8-hour	500	10,000[n]	Maximum 2nd highest[h]
	1-hour	2,000	40,000[n]	Maximum 2nd highest[h]
Sulfur Dioxide (SO_2)	Annual	1.0	80[g]	Maximum 1st highest[h]
	24-hour	5	365[n]	Maximum 2nd highest[h]
	3-hour	25	1,300[n]	Maximum 2nd highest[h]
	1-hour	3 ppb[o]	75 ppb[p]	Mean of maximum 4th highest[q]
Nitrogen Dioxide (NO_2)	Annual	1.0	100[g]	Maximum 1st highest[h]
	1-hour	4 ppb[o]	100 ppb[r]	Mean of maximum 8th highest[s]
Lead (Pb)	Quarterly	NA	1.5[g]	Maximum 1st highest[h]
	3-month[t]	NA	0.15[g]	Maximum 1st highest[h]

a. Idaho Air Rules Section 006.105.
b. Micrograms per cubic meter.
c. Incorporated into Idaho Air Rules by reference, as per Idaho Air Rules Section 107.03.b.
d. The maximum 1st highest modeled value is always used for the significant impact analysis.
e. Particulate matter with an aerodynamic diameter less than or equal to a nominal ten micrometers.
f. The annual PM_{10} standard was revoked in 2006. The standard is still listed because compliance with the annual $PM_{2.5}$ standard is demonstrated by a PM_{10} analysis that demonstrates compliance with the revoked PM_{10} standard.
g. Not to be exceeded in any calendar year.
h. Concentration at any modeled receptor.
i. Never expected to be exceeded more than once in any calendar year.
j. Concentration at any modeled receptor when using five years of meteorological data.
k. Particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers.
l. 3-year average of annual concentration.
m. 3-year average of the upper 98th percentile of 24-hour concentrations.
n. Not to be exceeded more than once per year.
o. Interim SIL established by EPA policy memorandum.
p. 3-year average of the upper 99th percentile of the distribution of maximum daily 1-hour concentrations.
q. Mean (of 5 years of data) of the maximum of 4th highest daily 1-hour maximum modeled concentrations for each year of meteorological data modeled.
r. 3-year average of the upper 98th percentile of the distribution of maximum daily 1-hour concentrations.
s. Mean (of 5 years of data) of the maximum of 8th highest daily 1-hour maximum modeled concentrations for each year of meteorological data modeled.
t. 3-month rolling average.

2.1.3 Toxic Air Pollutant Analyses

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

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

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

> *Using the methods provided in Section 210, the emissions of toxic air pollutants from the stationary source or modification would not injure or unreasonably affect human or animal life*

or vegetation as required by Section 161. Compliance with all applicable toxic air pollutant carcinogenic increments and toxic air pollutant non-carcinogenic increments will also demonstrate preconstruction compliance with Section 161 with regards to the pollutants listed in Sections 585 and 586.

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

2.2 Background Concentrations

Background concentrations are used in the cumulative NAAQS impact analyses to account for impacts from sources not explicitly modeled. Table 3 lists appropriate background concentrations for rural Idaho areas.

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

Table 3. BACKGROUND CONCENTRATIONS

Pollutant	Averaging Period	Background Concentration ($\mu g/m^3$)[a]
PM_{10}[b]	24-hour	73
	Annual	26
Carbon monoxide (CO)	1-hour	3,600
	8-hour	2,300
Sulfur dioxide (SO_2)	3-hour	34
	24-hour	26
	Annual	8
Nitrogen dioxide (NO_2)	Annual	17
Lead (Pb)	Quarterly	0.03

a. Micrograms per cubic meter.

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

3.0 Modeling Impact Assessment

3.1 Modeling Methodology

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

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

3.1.1 Overview of Analyses

DEQ performed non-site-specific analyses that were determined to be reasonably representative of the proposed HMA plant, and the results demonstrated compliance with applicable air quality standards to DEQ's satisfaction.

Because of the portable nature of HMA plants, DEQ performed non-site-specific modeling to establish setback distances between locations of emissions points and the property boundary of the proposed HMA plant.

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

Table 4. MODELING PARAMETERS

Parameter	Description/Values	Documentation/Addition Description[a]
General Facility Location	Portable	Can only locate in attainment or unclassifiable areas
Model	AERMOD	AERMOD with the PRIME downwash algorithm, version 09292
Meteorological Data	Multiple Data Sets	See Section 3.1.4
Terrain	Flat	The analyses assumed flat terrain for the immediate area
Building Downwash	Considered	A structure of 3 m X 2.5 m X 3 m high was assumed for downwash consideration, representing a large generator.
Receptor Grid	Grid 1	5-meter spacing along the property boundary out 100 meters
	Grid 2	10-meter spacing out to 200 meters

3.1.2 Modeling protocol and Methodology

A modeling protocol was not submitted to DEQ prior to the application because DEQ staff performed non-site-specific air quality impact analyses rather than the applicant. Non-site-specific modeling was generally conducted using data and methods described in the *State of Idaho Air Quality Modeling Guideline.*

Because of the portable nature of the HMA plant, DEQ performed non-site-specific modeling to establish setback distances between locations of emissions points and the property boundary for the proposed HMA plant.

3.1.3 Model Selection

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

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

AERMOD offers the following improvements over ISCST3:

- Improved dispersion in the convective boundary layer and the stable boundary layer
- Improved plume rise and buoyancy calculations

- Improved treatment of terrain affects on dispersion
- New vertical profiles of wind, turbulence, and temperature

AERMOD was used for the DEQ analyses to evaluate impacts of the proposed HMA plant.

3.1.4 Meteorological Data

Because of the portable nature of HMA plants, DEQ used seven different meteorological data sets from various locations in Idaho to assure compliance with applicable standards for the non-site-specific analyses. Table 5 lists the meteorological data sets used in the air impact analyses.

Table 5. METEOROLOGICAL DATA SETS USED IN MODELING ANALYSES

Surface Data	Upper Air Data	Years
Boise	Boise	2001-2005
Aberdeen	Boise	2001-2005
Idaho Falls	Boise	2000-2004
Minidoka	Boise	2000-2004
Soda Springs	Boise	2004-2008
Lewiston	Spokane, Wa	1992-1995, 1997
Sandpoint	Spokane, Wa	2002-2006

Use of representative meteorological data is of greater concern when using AERMOD than when using ISCST3. This is because AERMOD uses site-specific surface characteristics to more accurately account for turbulence. To account for this uncertainty, the following measures were taken:

- Use the maximum of 2^{nd} high modeled concentration to evaluate compliance with the 24-hour PM_{10} standard, rather than the maximum of 6^{th} high modeled concentration typically used when modeling a five-year meteorological data set to demonstrate that the standard will not be exceeded more than once per year on average over a three year period.

- Use the maximum of 1^{st} high modeled concentration to evaluate compliance with all pollutants and averaging times, except for 24-hour PM_{10}.

3.1.5 Terrain Effects

Terrain effects on dispersion were not considered in the non-site-specific analyses. Assuming flat terrain is not a critical limitation of the analyses because most emissions points associated with HMA plants are near ground-level and the immediate surrounding area is typically flat for dispersion modeling purposes. Emissions sources near ground-level typically have maximum pollutant impacts near the source, minimizing the potential affect of surrounding terrain to influence the magnitude of maximum modeled impacts.

3.1.6 Facility Layout

DEQ's analyses used a conservative generic facility layout. This was done because the specific layout will vary depending upon product needs and specific characteristics of the site. To provide conservative results, DEQ used a tight grouping of emissions sources. Sources were positioned within 2.5 meters of the center of the facility.

3.1.7 Building Downwash

Downwash effects caused by the generator housing were accounted for by including the generator structure as a building with dimensions of 3.0 meter by 2.5 meter by 3.0 meter high.

Downwash effects from other structures at the site were not accounted for because of the following:

- Determining a building configuration is extremely difficult given the portable nature of the facility.
- Much of the equipment is porous with regard to wind, thereby minimizing downwash effects.

3.1.8 Ambient Air Boundary

DEQ's non-site-specific analyses, using a generic facility layout, were used to generate minimum setback distances between emissions units and the property boundary or the established boundary to ambient air (if not the same as the property boundary). Ambient air is any area where the general public (anyone not under direct control of the HMA plant) has access. The issued permit may specify throughput restrictions as a function of the setback from ambient air available at any specific site.

3.1.9 Receptor Network and Generation of Setback Distances

Setback distances were determined by first modeling the plant using a dense receptor grid. Results were then reviewed to find the receptor furthest from any emissions source that shows an exceedance of the standard when combined with a background value. The setback distance was calculated as the maximum distance between the next furthest receptor and any emissions point.

A circular grid with 5.0 meter receptor spacing, extending out to at least 100 meters, was used in the non-site-specific modeling performed by DEQ. A secondary grid with 10-meter spacing, extending out to about 200 meters, was also used to assure the maximum impact was captured by the modeling run. To establish a setback distance, the following procedure was followed:

1) Trigger values for the modeling analyses were determined. These are values, when combined with background concentrations, indicated an exceedance of a standard. They were calculated by subtracting the background value from the standard (because the model does not specifically include background in the results). The following are trigger values:

PM_{10}	24-hour	77 $\mu g/m^3$
	annual	24 $\mu g/m^3$
SO_2	3-hour	1266 $\mu g/m^3$
	24-hour	339 $\mu g/m^3$
	annual	72 $\mu g/m^3$
CO	1-hour	36400 $\mu g/m^3$
	8-hour	7700 $\mu g/m^3$
NO_2	annual	83 $\mu g/m^3$

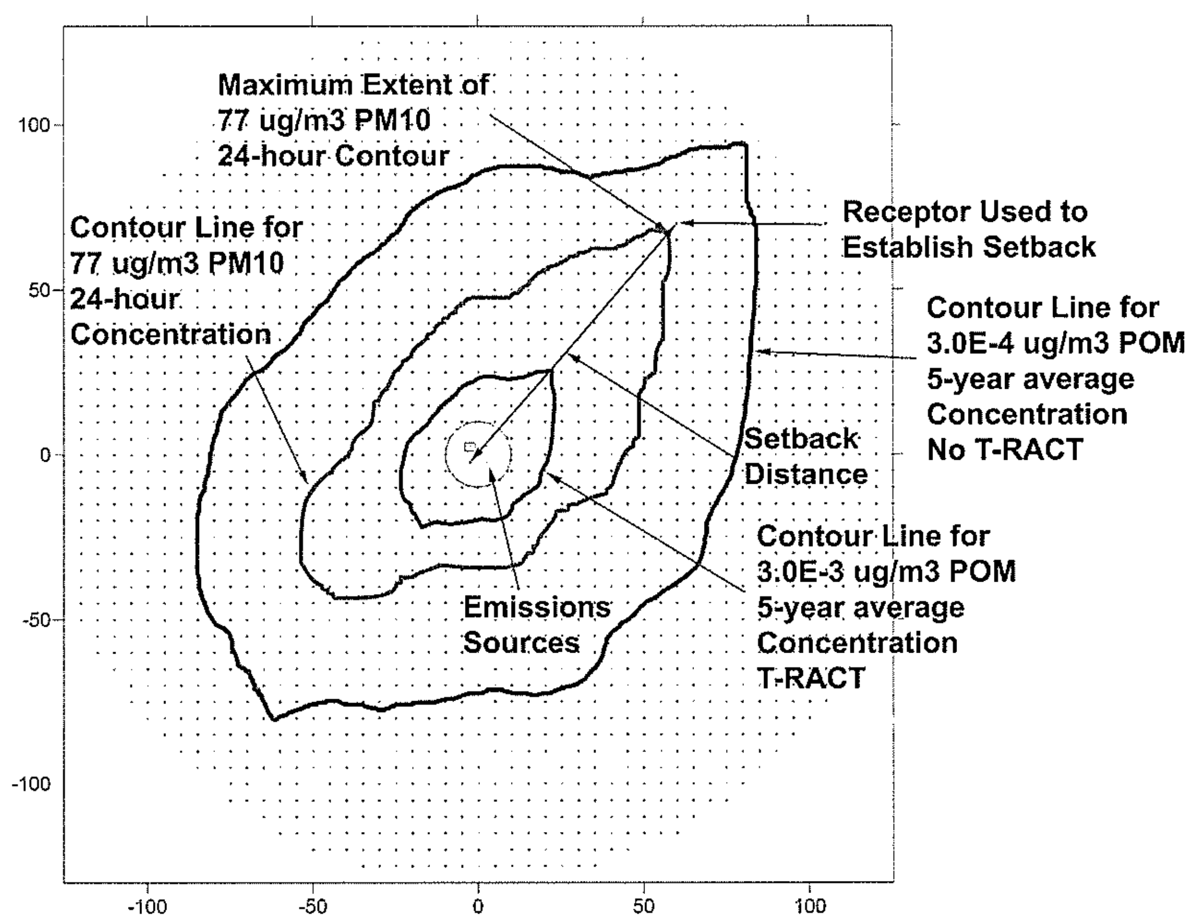
2) For each pollutant, averaging period, and meteorological data set, all receptors with concentrations equal or greater than the trigger value were plotted. This effectively gave a plot of receptors where the standard could be exceeded for that pollutant and averaging period.

3) The controlling receptor for each pollutant, averaging period, and meteorological data set was identified. First, the receptor having a concentration in excess of the trigger value that was the furthest from any emissions source was identified. The controlling receptor was the next furthest downwind receptor from that point.

4) The minimum setback distance was calculated. This was the furthest distance between an emissions point and the controlling receptor.

Figure 1 shows a hypothetical example of how setback distances are determined for a specific modeling run.

Figure 1 - Determination of Setback Distance for a Modeling Run



Emissions points are grouped in a cluster at the center within a 5.0 meter square area. The outer-most contour line shows POM concentrations at the AACC for that TAP. POM would be the controlling pollutant if T-RACT were not implemented, and the resulting setback distance would be very large. Accounting for T-RACT results in a substantially smaller contour (allowable concentrations at a factor of ten larger), as indicated by the inner-most contour. The middle contour line shows the extent of modeled concentrations exceeding the trigger value for 24-hour PM_{10}. The point on the contour line that is the furthest from the emissions points is identified, and then the controlling receptor is identified as the next furthest receptor beyond that point. The distance is determined from the coordinates of the controlling receptor according to the following (with the center of the emissions sources at 0.0 m Northing and 0.0 m Easting):

$$\text{Distance} = \sqrt{\left(\left|\text{Northing Coordinate}\right| + 3\right)^2 + \left(\left|\text{Easting Coordinate}\right| + 3\right)^2}$$

The factor of 3 in the equation accounts for an emissions point located on the opposite side of the facility center from where the maximum impact is (at -2.5 meters Easting, -2.5 meters Northing if the maximum setback distance is in the direction of positive easting and northing coordinates).

3.2 Emission Rates

Emissions rates of criteria pollutants and TAPs were calculated for the proposed HMA plant as a function of production rates for various applicable averaging periods.

3.2.1 Criteria Pollutant Emissions Rates

Table 6 lists criteria pollutant emissions rates used in the DEQ non-site-specific modeling analyses for the proposed HMA plant for all applicable averaging periods. Attachment 1 provides additional details of DEQ emissions calculations.

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

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

DEQ's air impact analyses assumed that daily operations and resulting emissions during the period of December 1 through March 31 were at half those otherwise listed at the top of Table 6. The reductions in emissions were only applied to sources where emissions are a direct function of throughput. Reductions were not applied to generator engines and the asphalt oil tank heater.

Operations of the 2 MMBtu/hour asphalt oil tank heater were assumed to be 8.0 hour/day and 2,000 hour/year. This accounts for the intermittent nature of the heater – only operating a maximum of about 33 percent of the time while keeping asphalt oil at desired temperature.

Short-term CO emissions are estimated to be about 66 pounds/hour. This is below the DEQ discretionary modeling threshold of 70 pounds/hour. The discretionary threshold was designed to assure impacts remain below SILs for applicable sources, which is well below the CO NAAQS. DEQ is confident that impacts from a 480 ton/hour HMA plant would be well below the CO NAAQS, since maximum emissions are below the 70 pounds/hour threshold and these emissions represent facility-wide emissions rather than project emissions that are only a fraction of facility-wide emissions. Specific modeling for CO was not performed to provide additional compliance assurance.

Table 6. EMISSIONS USED IN DEQ ANALYSES

Emissions Point in Model	Pollutant	Averaging Period	Emissions Rate (lb/hr) 480 ton/hr, 3,800 ton/day[a], 150,000 ton/yr
DRYER – drum dryer/mixer - fueled by natural gas, diesel, or used oil - emissions controlled by a baghouse	PM_{10}	24-hour	3.735
		annual	0.4038
	CO	1-hour 8-hour	55.75
	SO_2	3-hour	4.675
		24-hour	1.742
		Annual	0.1884
	NOx	annual	0.9418
SILO – asphalt storage silo[b]	PM_{10}	24-hour	0.0
		annual	0.0
	CO	1-hour 8-hour	0.0
LOAD – asphalt loadout	PM_{10}	24-hour	0.08264
		annual	0.008937
	CO	1-hour 8-hour	0.5734
HOTOIL[c] – asphalt oil heater	PM_{10}	24-hour	0.01605
		annual	0.01100
	CO	1-hour 8-hour	0.1647
	SO_2	3-hour	0.1036
		24-hour	0.03454
		Annual	0.02366
	NOx	annual	0.06665
GEN1[d] – electrical generator	PM_{10}	24-hour	0.6549
		annual	0.6549
	CO	1-hour 8-hour	8.781
	SO_2	3-hour	0.05050
		24-hour	0.02525
		Annual	0.02525
	NOx	annual	16.53
GEN2[d] – electrical generator	PM_{10}	24-hour	0.2201
		annual	0.1101
	CO	1-hour 8-hour	0.6745
	SO_2	3-hour	0.2059
		24-hour	0.2059
		Annual	0.1030
	NOx	annual	1.566
MATHNDHI[e] – aggregate handling by frontend loader	PM_{10}	24-hour	0.2324
		annual	0.02514
CONVEY – conveyors, scalping screen	PM_{10}	24-hour	0.1224
		annual	0.01443

a. During December 1 through March 31 throughput and resulting emissions levels will be half that listed.
b. Silo filling emissions are routed back to the drum dryer.
c. Assumes 8 hr/day and 2000 hr/year of actual operation.
d. Assumes 12 hr/day and 4380 hr/year operation.
e. Emissions are varied in the model according to wind speed category. Emissions listed are based on a 10 mph wind speed.

3.2.2 TAP Emissions Rates

Table 7a lists TAP emissions rates for those TAPs exceeding ELs for an HMA plant producing 150,000 ton HMA/year and Table 7b provides a summary of facility-wide TAPs with a comparison to the EL or 10 times the EL for carcinogenic TAPs of Idaho Air Rules Section 586 for which T-RACT is used for an emissions control.

Table 7a. TAP EMISSIONS USED IN DEQ ANALYSES

Emissions Point in Model	Pollutant	Averaging Period	Emissions Rate for 150,000 ton HMA/yr (lb/hr)
DRYER – drum dryer/mixer - emissions controlled by a baghouse	Arsenic	period	9.59E-6
	Cadmium	period	7.02E-6
	Chromium 6+	period	7.71E-6
	Nickel	period	1.08E-3
	Acetaldehyde	period	2.23E-2
	Benzene	period	6.68E-3
	Dioxins/furans	period	5.24E-11
	Formaldehyde	period	5.31E-2
	PAH (naphthalene)	period	1.11E-2
	POM	period	9.38E-6
	HCl[a]	24-hour	3.33E-2
	Quinone[a]	24-hour	5.53E-2
SILO – asphalt storage silo[b]	Benzene	period	6.68E-5
	Formaldehyde	period	1.44E-3
	PAH(naphthalene)	period	9.61E-4
	POM	period	1.16E-5
LOAD – asphalt loadout	Benzene	period	3.70E-5
	Formaldehyde	period	3.70E-5
	PAH(naphthalene)	period	6.27E-5
	POM	period	7.88E-6
HOTOIL[c] – asphalt oil heater	Arsenic	period	4.40E-6
	Cadmium	period	1.33E-6
	Chromium 6+	period	8.26E-7
	Nickel	period	2.82E-4
	Benzene	period	9.40E-7
	Dioxins/furans	period	1.04E-12
	Formaldehyde	period	3.36E-5
	PAH (naphthalene)	period	5.67E-5
	POM	period	3.38E-7
GEN1[d] – electrical generator	Acetaldehyde	period	1.78E-4
	Benzene	period	5.49E-3
	Formaldehyde	period	5.58E-4
	PAH (naphthalene)	period	9.19E-4
	POM	period	3.18E-5
GEN2[d] – electrical generator	Acetaldehyde	period	3.75E-4
	Benzene	period	4.56E-4
	Formaldehyde	period	5.77E-4
	PAH (naphthalene)	period	4.15E-5
	POM	period	1.68E-6

a. Emissions rate based on 3800 ton/day throughput.
b. Emissions released through the drum dryer stack.
c. Assumes 2000 hr/year of actual operation.
d. Assumes 6000 hr/year of actual operation.

Table 7b. SUMMARY OF FACILITY-WIDE TAP EMISSIONS USED FOR MODELING					
TOTALS	**TAP**	**Averaging Period**	**Emissions**	**EL**	**Modeling Required (10 X EL for AACCs)**
	Acetaldehyde	period	2.281E-2	3.0E-3	No
	Arsenic	period	1.399E-5	1.5E-6	No
	Benzene	period	1.227E-2	8.0E-4	Yes
	Cadmium	period	8.347E-6	3.7E-6	No
	Chromium 6+	period	8.531E-6	5.6E-7	Yes
	Dioxins/furans	period	5.344E-11	1.5E-10	No
	Formaldehyde	period	5.575E-2	5.1E-4	Yes
	Nickel	period	1.361E-3	2.7E-5	Yes
	PAH(naphthalene)	period	1.319E-2	9.1E-5	Yes
	POM	period	6.263E-5	2.0E-6	Yes
	HCl	24-hour	3.325E-2	5E-2	No
	Quinone	24-hour	2.533E-2	2.7E-2	No

Allowable impacts of carcinogenic TAPs may be 10 times the AACC if DEQ determines the facility uses T-RACT to control emissions. When T-RACT is used, DEQ has determined that compliance with a concentration of 10 times the AACCs is assured if emissions remain below 10 times the ELs. This approach is valid because conservative modeling was used to generate the emissions screening levels (ELs) of Idaho Air Rules Section 586, assuring that impacts are less than AACCs when emissions are less than ELs. Consequently, if emissions are below 10 times the ELs it is assured that impacts are below 10 times AACCs.

These air impact analyses assumed T-RACT was implemented for sources of TAPs at the HMA plant.

3.3 Emission Release Parameters and Plant Criteria

Table 8 lists the characteristics of the proposed HMA plant that were used in DEQ's non-site-specific air impact analyses.

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

Asphalt loadout was modeled as a point sources, rather than a volume sources, to account for thermal buoyancy of the emissions. Release parameters for asphalt loadout was based on the following:

- 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.

Emissions from silo loading were modeled assuming those emissions are routed back into the drum dryer. Combined dryer and silo filling emissions were modeled through the drum dryer stack.

Table 8. CHARACTERISTIC OF HMA PLANT USED IN DEQ ANALYSES	
Parameter	**Value or Description**
Throughput Rates	480 ton/hr, 3,800 ton/day[a], 150,000 ton/yr
Co-Contributing Sources	The emissions points of the HMA plant are not located within 1,000 feet of other permittable emissions sources. A rock crushing plant could be operated at the site provided it is not operated during any day when the HMA plant is operated and annual throughput is less than 500,000 ton/yr. Alternatively, a rock crusher could be operated simultaneously (both operating in a given day) with the HMA plant provided the HMA throughput for that day does not exceed a value of half that otherwise allowed.
Dryer	Drum dryer fueled by natural gas, diesel, or used oil, with a baghouse for emissions control.
Dryer Stack Parameters	Stack height ≥9.1 m, stack diameter ≈1.1 m, gas temp ≥ 394 K, flow velocity ≥25 m/sec.
Asphalt Loadout	Model as a point source. Stack height = 5 m, stack diameter = 3.0 m, gas temp = 346 K (163° F), flow velocity = 0.1 m/sec. These parameters were developed by the modeling group to represent the nature of released emissions from this source in most all applications.
Tank Heater	<2 MMBtu/hr heat input, using either natural gas or distillate. ≤8 hr/day and 2000 hr/yr operation.
Heater Stack Parameters	Stack height ≥3.7 m, stack diameter ≈0.2 m, gas temp ≥422 K, flow velocity ≥22.0 m/sec.
Electrical Power	Line power or diesel-fired generators with the following characteristics: 1) a large generator powered by a engine between 175 bhp and 1475 bhp, burning 0.05% S fuel; 2) a small generator powered by a engine of less than 102 bhp, burning 0.05% S fuel. Other generators or combination of generators can be used provided the cumulative bhp rating of the engines do not exceed 102 bhp for smaller engines (those <175 bhp) and 1475 bhp for larger engines. Hours of operation will be ≤12 hr/day for the large generator, 24 hr/day for the small generator, and ≤4,380 hr/yr for each.
Large Generator Stack Parameters	Stack height ≥4.6 m, stack diameter ≈ 0.2 m, gas temp ≥500 K, flow velocity ≥64 m/sec.
Small Generator Stack Parameters	Stack height ≥1.8 m, stack diameter ≈ 0.15 m, gas temp ≥500 K, flow velocity ≥12 m/sec.
Conveyor Transfers	≤3 transfers for any given quantity of material processed. Emissions controlled to a point equivalent to use of a water spray.
Scalping Screen	≤1 screen for any given quantity of material processed. Emissions controlled to a point equivalent to use of a water spray.
Frontend Loader Transfers	≤2 transfers for any given quantity of material processed. Typically involves: 1) aggregate to storage pile; 2) aggregate from pile to hopper.
Seasonal Restriction	Throughput is restricted to half allowable rates during the period between December 1 and March 31.

[a] Half the listed value for December 1 through March 31.

3.4 Results for Cumulative NAAQS Impact Analyses and TAPs Analyses

DEQ calculated required setback distances from the non-site-specific modeling results for each criteria pollutant/TAP and averaging period. Table 10 lists controlling setback distances for two scenarios: 1) HMA plant operation with diesel-fired generators; 2) HMA plant operation without diesel-fired generators. Setback distances are the closest distance between the property boundary and the emissions release point of any emissions source (HMA plant stack, asphalt loadout point, aggregate hoppers, generator stacks, scalping screen, or conveyor transfer points).

Table 9. EMISSIONS RELEASE PARAMETERS					
Release Point /Location	**Source Type**	**Stack Height (m)[a]**	**Modeled Diameter (m)**	**Stack Gas Temp. (K)[b]**	**Stack Gas Flow Velocity (m/sec)[c]**
DRYER	Point	9.1	1.1	394	25
LOADOUT	Point	5.0	3.0	346	0.1
HOTOIL	Point	3.7	0.2	422	22
GEN1	Point	4.6	0.2	500	64
GEN2	Point	1.8	0.15	500	12
Volume Sources					
Release Point /Location	**Source Type**	**Release Height (m)**	**Initial Horizontal Dispersion Coefficient σ_{y0} (m)**	**Initial Vertical Dispersion Coefficient σ_{z0} (m)**	
MATHNDHI	Volume	2.5	4.65	1.16	
CONVY	Volume	5.0	4.65	1.16	

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

Table 10. SETBACK DISTANCES					
HMA Configuration Scenario	**Setback (m)**	**Controlling Pollutant**	**HMA Configuration Scenario**	**Setback (m)**	**Controlling Pollutant**
Setback for 3,800 ton HMA/day and 150,000 ton HMA/year					
Scenario 1[a]: mod fugitive dust control, baghouse on dryer, diesel generator	87	24hr-PM_{10}	Scenario 2[b]: mod fugitive dust control, baghouse on dryer, no generator	64	24hr-PM_{10}
a. Scenario 1: moderate control of fugitives from material handling; 2 MMBtu/hr diesel boiler; 1,475 bhp and 102 bhp engine for generator; control on conveyors and screen equal to water spray.					
b. Scenario 2: moderate control of fugitives from material handling; 2 MMBtu/hr diesel boiler; control on conveyors and screen equal to water spray.					

3.5 Locating with Other Facilities/Equipment

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

HMA plants commonly co-locate with rock crushing plants. Since the 24-hour PM_{10} impacts are the governing criteria for setback distances for most operational scenarios (governing for criteria pollutants – contributions of TAPs from other facilities are not considered in permitting analyses for the HMA plant). DEQ modeling staff determined NAAQS compliance is still assured when a rock crushing plant co-locates with the HMA plant, provided the HMA plant does not operate during any day when the rock crushing plant is operating and the annual actual throughput of the rock crushing plant is not greater than 500,000 tons. DEQ modeling staff also determined NAAQS compliance is assured when operating the HMA plant during the same day as the rock crushing plant, provided the throughput of the HMA plant is half that assumed for the modeling analyses used to generate setback distances.

4.0 Conclusions

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

ATTACHMENT 1

EMISSIONS CALCULATIONS AND MODELING PARAMETERS FOR

DEQ'S AIR IMPACT ANALYSES

HMA Plant Modeled Emissions Rates

Setback requirements are linked to throughput levels and the equipment configuration.

Drum Dryer Emissions

The DEQ HMA plant emissions calculation spreadsheet was used to generate emissions quantities for applicable averaging periods. Emissions calculations assume worst-case fuels of either used oil, diesel, natural gas, or LPG. Emissions also assume control by a baghouse.

Asphalt Loadout

The DEQ HMA plant emissions calculation spreadsheet was used to generate emissions quantities for applicable averaging periods.

Asphalt Silo Filling

The DEQ HMA plant emissions calculation spreadsheet was used to generate emissions quantities for applicable averaging periods. Emissions from silo filling were combined with emissions from the drum dryer since those emissions will be routed back through the dryer.

Asphalt Tank Heater Emissions

The DEQ HMA plant emissions calculation spreadsheet was used to generate emissions quantities for applicable averaging periods.

Power Generator

Emissions were modeled using two different operational scenarios. One scenario involves operating two diesel-fired engines: 1) a diesel engine with a 1,475 bhp rating or less, operating up to 12 hours per day and 4,380 hours per year; 2) a diesel engine with a 102 bhp rating or less, operating up to 24 hours per day and 4,380 hours per year. The other operational scenario does not involve operation of a generator. Emissions estimates were calculated assuming no EPA certification for the engines and combustion of 0.0015% sulfur diesel. Generator operations of 12 hours per day and 4,380 hours per year were used to calculate emissions for respective averaging periods.

Aggregate Handling Emissions

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

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

Emissions were calculated using the following emissions equation:

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

Where:

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

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

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

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

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

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

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

Adjustment factors to put in the model:

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

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

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

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

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

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

For the operational scenario for 3,800 ton/day HMA and 150,000 ton/year HMA, emissions are as follows:

Daily PM_{10}:

7.646 E-4 lb PM_{10}	3648 ton	day	2 transfers	=	0.2324 lb
ton	day	24 hr			hr

Annual PM_{10}:

$$\frac{7.646\text{ E-4 lb } PM_{10}}{\text{ton}} \left| \frac{144{,}000\text{ ton}}{\text{yr}} \right| \frac{\text{yr}}{8{,}760\text{ hour}} \left| \, 2\text{ transfers} = \frac{0.02514\text{ lb}}{\text{hr}} \right.$$

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

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

σ_{yo} = 20 m / 4.3 = 4.65 m

σ_{zo} = 5 m / 4.3 = 1.16 m

Conveyors and Screens Emissions

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

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

For the operational scenario for 3,800 ton/day HMA and 150,000 ton/year HMA, emissions are as follows:

Scalping Screen (controlled emissions):

Daily PM_{10}:

$$\frac{0.00074\text{ lb } PM_{10}}{\text{ton}} \left| \frac{3{,}648\text{ ton}}{\text{day}} \right| \frac{\text{day}}{24\text{ hour}} = \frac{0.1125\text{ lb}}{\text{hr}}$$

Annual PM_{10}:

$$\frac{0.00074\text{ lb } PM_{10}}{\text{ton}} \left| \frac{144{,}000\text{ ton}}{\text{yr}} \right| \frac{\text{yr}}{8{,}760\text{ hour}} = \frac{0.01216\text{ lb}}{\text{hr}}$$

Conveyor Transfers (controlled emissions):

Daily PM_{10}:

$$\frac{4.60\text{ E-5 lb } PM_{10}}{\text{ton}} \left| \frac{3{,}648\text{ ton}}{\text{day}} \right| \frac{\text{day}}{24\text{ hour}} \left| \, 3\text{ transfers} = \frac{0.02098\text{ lb}}{\text{hr}} \right.$$

Annual PM_{10}:

$$\frac{4.60\text{ E-5 lb } PM_{10}}{\text{ton}} \left| \frac{144{,}000\text{ ton}}{\text{yr}} \right| \frac{\text{yr}}{8{,}760\text{ hour}} \left| \, 3\text{ transfers} = \frac{0.002268\text{ lb}}{\text{hr}} \right.$$

Total Daily Emissions (unloading, screening, conveyors) = 0.1754 lb/hr

Total Annual Emissions (unloading, screening, conveyors) = 0.01896 lb/hr

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

σ_{yo} = 20 m / 4.3 = 4.65 m

σ_{zo} = 5 m / 4.3 = 1.16 m

HMA Plant Modeling Parameters

Dryer Baghouse Stack

Release height = 9.1 meters; effective diameter of release area = 1.1 meters; typical stack gas temperature = 394 K; typical flow velocity = 25 meters/second

Asphalt Silo Filling

Emissions are released through the dryer baghouse stack.

Asphalt Loadout

DEQ modeled this source as a point source.
- release height of 5 meters (equal to height of silo)
- 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° F / 2 = 163° F
- stack velocity of 0.1 m/sec to account for convective air flow.

Aggregate to and from Storage

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

Conveyor Transfers and Scalping Screen

Release emissions in model from a 20 m X 20 m area 5 m high, released at 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: all conveyor transfers associated with HMA operations

Asphalt Oil Heater

Stack parameters are dependent upon the fuel combusted. A combustion evaluation was used to estimate actual stack flow, assuming respective fuel requirements for a 2 MMBtu/hr boiler and a stack gas release temperature of 422 K.

Parameters for the diesel-fired boiler are as follows:

> Stack height = 3.7 m; stack diameter = 0.2 meters; stack gas temperature = 422 K; flow velocity = 22.0 meters/second

Power Generator

Stack gas temperatures and flow rates are often overestimated by permit applicants, likely because values reported by manufacturers are based on values measured at the exhaust manifold rather than at the point of release to the atmosphere.

The parameters used in modeling for the large diesel generator were derived by the following process:

1. The flow for a 1,000 kW generator found online was 6,907 cfm at 959° F (515° C)(788 K)
2. A reasonably conservative (on the low side) release temperature of 500 K was selected and the acfm flow of 4,383 was calculated for the new temperature.
3. A stack diameter of 0.2 m was provided by the applicant. For a flow of 4,383 acfm, the flow velocity is 63.8 m/sec.

The final point source parameters were as follows:

> Stack height = 4.6 m; stack diameter = 0.2 meters; stack gas temperature = 500 K; flow velocity = 64 meters/second.

The parameters used in modeling for the smaller diesel generator were derived by the following process:

1. The flow for a 100 kW generator found online was 805 cfm at 1076° F (580° C)(853 K)
2. A reasonably conservative (on the low side) release temperature of 500 K was selected and the acfm flow of 472 was calculated for the new temperature.
3. A stack diameter of 0.15 m was provided by the applicant. For a flow of 472 acfm, the flow velocity is 12 m/sec.

The final point source parameters were as follows:

> Stack height = 1.8 m; stack diameter = 0.15 meters; stack gas temperature = 500 K; flow velocity = 12 meters/second.

APPENDIX C – T-RACT ANALYSIS

T-RACT ANALYSIS
Permit to Construct for a Portable Asphalt Plant

IDAPA 58.01.01.210: DEMONSTRATION OF PRECONSTRUCTION COMPLIANCE WITH TOXIC STANDARDS.

01. Identification of Toxic Air Pollutants. The applicant may use process knowledge, raw materials inputs, EPA and Department references and commonly available references approved by EPA or the Department to identify the toxic air pollutants emitted by the stationary source or modification. (6-30-95)

DEQ developed an emissions inventory spreadsheet, which includes toxic air pollutants, based on the conditions and assumptions used to develop this Permit to Construct. The spreadsheet for the proposed permitted asphalt production rates (425 T/hour, 3,800 T/day and 150,000 T/year) is provided in Appendix A of the Statement of Basis.

02. Quantification of Emission Rates.

a. The applicant may use standard scientific and engineering principles and practices to estimate the emission rate of any toxic air pollutant at the point(s) of emission. (6-30-95)

i. Screening engineering analyses use unrefined conservative data. (6-30-95)

ii. Refined engineering analyses utilize refined and less conservative data including, but not limited to, emission factors requiring detailed input and actual emissions testing at a comparable emissions unit using EPA or Department approved methods. (6-30-95)

Documentation of emissions factors is provided in the DEQ-developed Emissions Inventory Spreadsheet provided in Appendix A of the Statement of Basis.

Information regarding the following presentation of 02.b, c, and d:

- The yellow highlighted text identifies the three types of emission rates: uncontrolled; controlled; and T-RACT.
- The underlined text indicates the subtle differences between the three types of emission rates.

b. The uncontrolled emissions rate of a toxic air pollutant from a source or modification is calculated using the maximum capacity of the source or modification under its physical and operational design without the effect of any physical or operational limitations. (6-30-95)

i. Examples of physical and operational design include but are not limited to: the amount of time equipment operates during batch operations and the quantity of raw materials utilized in a batch process.

ii. Examples of physical or operational limitations include but are not limited to: shortened hours of operation, use of control equipment, and restrictions on production which are less than design capacity.

c. The controlled emissions rate of a toxic air pollutant from a source or modification is calculated using the maximum capacity of the source or modification under its physical and operational design with the effect of any physical or operational limitation that has been specifically described in a written and certified submission to the Department. *(6-30-95)*

d. The T-RACT emissions rate of a toxic air pollutant from a source or modification is calculated using the maximum capacity of the source or modification under its physical and operational design with the effect of: *(6-30-95)*

i. Any physical or operational limitation other than control equipment that has been specifically described in a written and certified submission to the Department; and *(6-30-95)*

ii. An emission standard that is T-RACT. *(6-30-95)*

T-RACT is defined in IDAPA 58.01.007.12 as:

"An emission standard based on the lowest emission of toxic air pollutants that a particular source is capable of meeting by the application of control technology that is reasonably available, as determined by the Department, considering technological and economic feasibility. If control technology is not feasible, the emission standard may be based on the application of a design, equipment, work practice or operational requirement, or combination thereof."

INTERPRETATIONS of 210.02:

- 210.02.d.i: T-RACT emissions are based on the uncontrolled emissions from the drum mixer, not the exit of the control device. For this permit, annualized cost effectiveness for each potential T-RACT equipment option for the drum mixer is based on the uncontrolled emissions.
- 210.02.d.ii: Once the T-RACT control device is determined, the ambient concentrations at the property boundary predicted by Subsections 585-586 may be increased by a factor of ten. As explained in Appendix B of the Statement of Basis, this goal is met through a non-standard Ambient Air Quality Impact Analysis developed by DEQ.

DISCUSSION: Metals - Quantification of Emission Rates:

- AP-42, Compilation of Air Pollutant Emission Factors, is the primary compilation of EPA's emission factor information. AP-42, Section 11, Hot Mix Asphalt Plants, Table 11.1-12 provides emission factors for metals from drum mixers for:
    - uncontrolled emissions with fuel oil;
    - baghouse controlled emissions with natural gas or propane;
    - baghouse controlled emissions with diesel and No. 6 fuel oil.
- The emission factor ratings range from C to E.
- The emission factors are the same for gaseous fuels and liquid fuels for all metals except lead and mercury.
- There are no emission factors in AP-42 for metals from any other type of control device.
- The control device manufacturers provide specific particulate control efficiencies for their equipment.
- Metals are part of the particulate load to the control device. The control efficiency is assumed to be the same for each metal.

03. Quantification of Ambient Concentrations. *(6-30-95)*

Refer to Appendix B of the Statement of Basis for a detailed discussion of the Ambient Air Quality Impact Analysis.

04. Preconstruction Compliance Demonstration. *The applicant may use any of the Department approved standard methods described in Subsections 210.05 through 210.08, and may use any applicable specialized method described in Subsections 210.09 through 210.12 to demonstrate preconstruction compliance for each identified toxic air pollutant.* *(6-30-95)*

TRACT analysis, as described in Subsection 210.12, is used to demonstrate preconstruction compliance with the toxic air pollutants of Sections 585-586.

05. Uncontrolled Emissions. *(6-30-95)*

a. *Compare the source's or modification's uncontrolled emissions rate for the toxic air pollutant to the applicable screening emission level listed in Sections 585- 586.* *(6-30-95)*

b. *If the source's or modification's uncontrolled emission rate is less than or equal to the applicable screening emission level, no further procedures for demonstrating preconstruction compliance will be required for that toxic air pollutant as part of the application process.* *(6-30-95)*

As explained earlier, uncontrolled emissions of metals from the drum mixer can be calculated. However, the only emissions factors for organic emissions from the drum mixer incorporate some type of control. For consistency in this T-RACT analysis, the emissions presented in Table 1 are all based on AP-42 values which incorporate some type of control. However, the emissions used in the T-RACT cost analysis spreadsheet for metals uses the uncontrolled values.

The majority of the potentially toxic air pollutants from this facility are below the screening ELs and no further action is required. However, DEQ has determined that the pollutants identified in the following table exceed Sections 585-586 ELs.

Table 1 Summary of TAPs that exceed Subsections 210.585-586 Emissions Limits (ELs)
All units expressed as lb/hr[1]

Pollutant	585-586 ELs	Facility
Acetaldehyde	3.0E-03	0.0224
Arsenic	1.5E-6	1.4E-5
Cadmium	3.7E-6	8.35E-06
Chromium (VI)	5.6E-7	8.53E-06
Nickel	2.7E-5	1.36E-03
Acetaldehyde	3.0E-3	0.0224
Benzene	8.0E-4	7.60E-03
Dioxins/furans[3]	1.5E-10	4.54E-08
Formaldehyde[4]	5.1E-4	5.48E-02
PAH[5]	9.1E-5	1.63E-02
POM[6]	2.0E-6	3.36E-05

1 Emissions rates are expressed as annual averages, except for quinone which is a 24-hour average.

2 Emissions as calculated with AP-42 factors, which are based on some type of control equipment being utilized. Refer to the EPA Background Document (posted online) for additional information.

3 As explained in 586, each dioxin/furan is multiplied by a toxicity factor. These adjusted emission rates are then summed for the facility.

4 Formaldehyde is an organic compound, but is not a polyorganic compound, and therefore not included in POM.

5 PAH is treated as a single HAP

6 POM is expressed as a seven PAH group and is treated as a single TAP

In terms of control, these toxic pollutants are grouped into two categories:

- Carcinogenic Metals: Arsenic, Cadmium, Hexavalent Chromium and Nickel
- Organics and acids:
  - Acetaldehyde (used oil combustion only), a HAP
  - Dioxins and furans, when treated as a single TAP
  - Hydrochloric acid (used oil combustion only), a TAP
  - Poly-Aromatic Hydrocarbons (PAH), including formaldehyde, when treated as a single HAP
  - Polycyclic Organic Matter (POM) , when treated as a single TAP
  - Quinone (used oil combustion only), a HAP

06. Uncontrolled Ambient Concentration. ***(6-30-95)***
Refer to Appendix B of the Statement of Basis for a detailed discussion of the Ambient Air Quality Impact Analysis.

07. Controlled Emissions and Uncontrolled Ambient Concentration. ***(6-30-95)***
Refer to Appendix B of the Statement of Basis for a detailed discussion of the Ambient Air Quality Impact Analysis.

08. Controlled Ambient Concentration. ***(6-30-95)***
Refer to Appendix B of the Statement of Basis for a detailed discussion of the Ambient Air Quality Impact Analysis.

09. Net Emissions ***(6-30-95)***
Net emissions are not considered in this permit.

10. Net Ambient Concentration. ***(6-30-95)***
Refer to Appendix B of the Statement of Basis for a detailed discussion of the Ambient Air Quality Impact Analysis.

11. Toxic Air Pollutant Offset Ambient Concentration. ***(6-30-95)***
Refer to Appendix B of the Statement of Basis for a detailed discussion of the Ambient Air Quality Impact Analysis.

12. T-RACT Ambient Concentration for Carcinogens. ***(6-30-95)***

a. *As provided in Subsections 210.12 and 210.13, the owner or operator may use T-RACT to demonstrate preconstruction compliance for toxic air pollutants listed in Section 586.* *(6-30-95)*

i. This method may be used in conjunction with netting (Subsection 210.09), and offsets (Subsection 210.11). *(6-30-95)*

Neither netting nor offsets are considered in this permit.

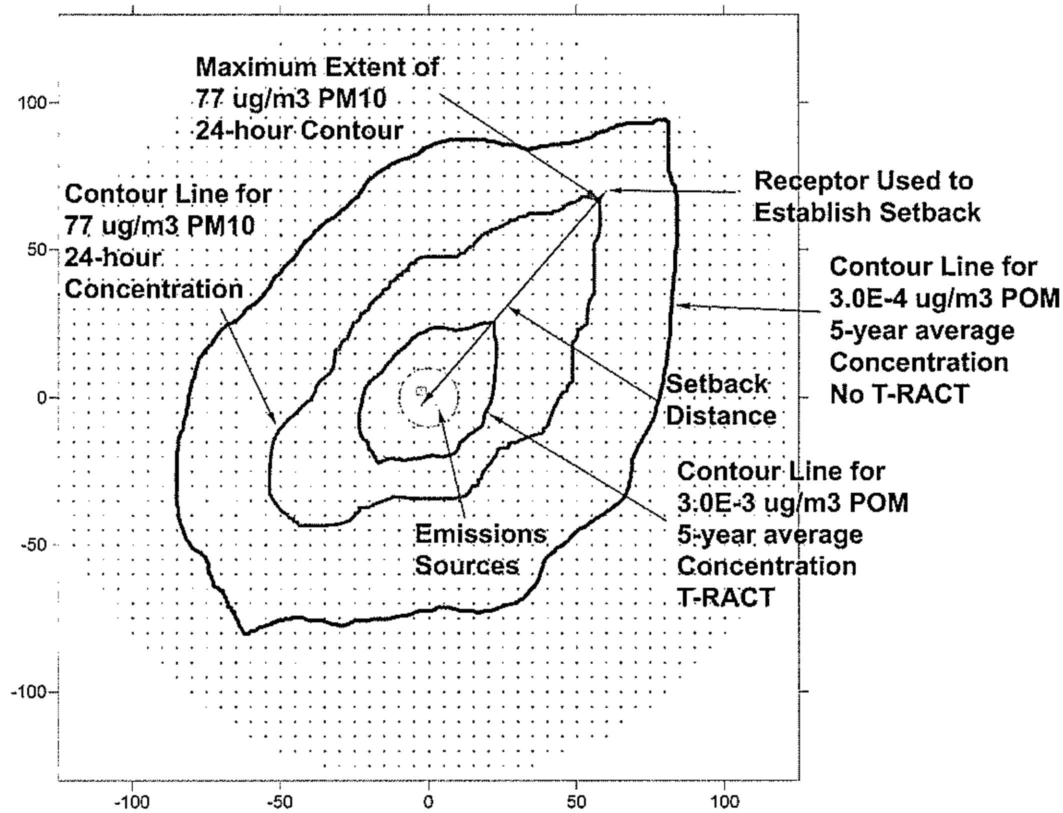
ii. This method is not to be used to demonstrate preconstruction compliance for toxic air pollutants listed in Section 585. *(6-30-95)*

Table 1 includes toxic air pollutants listed in either Section 585 or 586. Hydrochloric acid and quinone are listed in Section 585 and are not considered in this T-RACT analysis. T-RACT is being proposed for the toxic air pollutants listed in Section 586.

b. *Compare the source's or modification's approved T-RACT ambient concentration at the point of compliance for the toxic air pollutant to the amount of the toxic air pollutant that would contribute an ambient air cancer risk probability of less than one to one hundred thousand (1:100,000) (which amount is equivalent to ten (10) times the applicable acceptable ambient concentration listed in Section 586).* *(6-30-95)*

Under this permit, the ambient air quality impact analysis process is non-standard. In summary, the AACC is input to the impact analysis program to determine the distance required between the source and the point at which the ambient concentration has decreased to the AACC level. This point is called the "setback distance". This procedure is applied for each pollutant which triggered the T-RACT analysis. This is the "T-RACT setback distance". Refer to the following figure for a graphical representation.

Figure 1 - Determination of Setback Distance for a Modeling Run



Refer to Appendix B of the Statement of Basis for a detailed discussion of the Ambient Air Quality Impact Analysis.

c. *If the source's or modification's approved T-RACT ambient concentration at the point of compliance is less than or equal to the amount of the toxic air pollutant that would contribute an ambient air cancer risk probability of less than one to one hundred thousand (1:100,000), no further procedures for demonstrating preconstruction compliance will be required for that toxic air pollutant as part of the application process.* *(6-30-95)*

As discussed previously, T-RACT setback distances are determined by the point at which the potential toxic air pollutant levels have dissipated to a concentration below the ambient air cancer risk probability of less than one to one hundred thousand (1:100,000). As shown in the previous figure, the setback distance required for proper dissipation of PM_{10} is generally greater than the setback distance required to satisfy T-RACT concerns. The largest setback distance, whether for T-RACT or PM_{10}, is set as the permitted setback distance. For details, refer to Appendix B of the

Statement of Basis.

DEQ is satisfied that preconstruction compliance with toxic air pollutants listed in section 586 has been demonstrated.

d. The Department shall include emission limits and other permit terms for the toxic air pollutant in the permit to construct that assure that the facility will be operated in the manner described in the preconstruction compliance demonstration. (6-30-95)

Table 2: Permit Conditions that Assure Compliance with Toxic Standards

TAP	Contributing source	Permit conditions
Metals	Drum mixer	Used oil (RFO) meeting the specifications of 279.11
Metals	Drum mixer	Use of baghouse with ≥ 99% PM_{10} control
Metals	Drum mixer	Recycling of particulate collected from the baghouse back to the drum mixer
Organics (formaldehyde)	Drum mixer and loadout and silo-filling	Use of a covered conveyor from the drum mixer to the loadout and silo-filling

13. T-RACT Determination Processing. (6-30-95)

a. The applicant may submit all information necessary to the demonstration at the time the applicant submits the complete initial application or the applicant may request the Department to review a complete initial application to determine if Subsection 210.12 may be applicable to the source or modification. (6-30-95)

b. Notwithstanding Subsections 209.01.a. and 209.01.b., if the applicant requests the Department to review a complete initial application and Subsection 210.12 is determined to be applicable, the completeness determination for the initial application will be revoked until a supplemental application is submitted and determined complete. When the supplemental application is determined complete, the timeline for agency action shall be reinitiated. (6-30-95)

All of the documents submitted by the Applicant have been developed and reviewed by the Department.

14. T-RACT Determination. T-RACT shall be determined on a case-by-case basis by the Department as follows: (6-30-95)

a. The applicant shall submit information to the Department identifying and documenting which control technologies or other requirements the applicant believes to be T-RACT. (5-1-94)

For the purposes of this analysis, the toxic air pollutants included in this analysis are grouped into two categories: metals (which are particulate); and organics (which are gaseous).

Metals, including arsenic, cadmium, hexavalent chromium, and nickel, may be contained in trace amounts in the liquid fuels. Liquid fuels may be combusted in the drum mixer, asphalt tank heater, and the IC engines. Metals, if present, exit the combustion units as particulate.

A DEQ review of previously submitted and online used oil analysis did not report nickel concentrations. DEQ is satisfied that the T-RACT controls for arsenic, hexavalent chromium, and nickel will also be appropriate for cadmium because all metals are carried with the particulate. Therefore, whatever control technology most reasonably controls particulate will satisfy T-RACT for cadmium.

Organics, including acetaldehyde, benzene, dioxins/furans, formaldehyde, PAH and POM, may be emitted either during combustion or during silo filling or load-out of the HMA product.

Based on a review of permitted facilities and research contained in the EPA Air Pollution Control Cost Manual (EPA/452/B-02-001), the following control technologies were reviewed:

Metals:

- Additional treatment of used oil by the supplier
- Drum mixer baghouse
- Drum mixer scrubber

Organics:

- Good combustion practices on all combustion devices
- Covered conveyors from the drum mixer to the silo or load-out points
- Thermal oxidizer on the asphalt storage silo
- Thermal oxidizer (RTO) on the exhaust of the drum mixer baghouse

b. *The Department shall review the information submitted by the applicant and determine whether the applicant has proposed T-RACT.* *(5-1-94)*

All of the documents submitted by the Applicant have been developed and reviewed by the Department. The Department is satisfied that the information provided in this document meets the requirements of a T-RACT analysis.

c. *The technological feasibility of a control technology or other requirements for a particular source shall be determined considering several factors including, but not limited to:* *(5-1-94)*

i. *Process and operating procedures, raw materials and physical plant layout.* *(5-1-94)*

ii. *The environmental impacts caused by the control technology that cannot be mitigated, including, but not limited to, water pollution and the production of solid wastes.* *(5-1-94)*

iii. *The energy requirements of the control technology.* *(5-1-94)*

Metals Control Technological Feasibility

Options considered for technological feasibility:

- Additional treatment of used oil (by the supplier)
- Drum mixer baghouse
- Drum mixer scrubber

Additional treatment on used oil:

The permit allows only the use of used oil classified as RFO4, RFO5l, and RFO5H (as defined by ASTM D6488); and 40 CFR 279.11 and ASTM 6448. Used oil is different from "waste oil" in that used oil is oil that is cleaned of impurities, including metals, and may be blended with other oil to provide for clean and consistent combustion.

i. Used oil suppliers are capable of supplying used oil with lower metals content. This treatment would not take place at the asphalt plant site.

ii. The used oil supplier would be responsible for the disposable of the extracted metals; therefore, this additional treatment would not have an environmental impact at the asphalt plant site.

iii. The used oil supplier is responsible for additional energy costs; therefore, this additional treatment would not increase energy consumption at the asphalt plant site.

Additional treatment on used oil to control metal emissions meets the criteria for technological feasibility and will be considered for economic feasibility.

Drum Mixer baghouse:

i. For new installations, a baghouse is the preferred control device for a drum mixer. Baghouses are highly portable and considered as part of the typical installation.

   - In December 2000, EPA-454/R-00-019, published the "Hot Mix Asphalt Plants Emission Assessment Report". Section 2.1.4 states: "At most HMA facilities, fabric filters (baghouses) are used to control emissions from dryers (drum mixers). The material collected in those devices is recycled back into the process."
   - Two providers of drum mixer control equipment in Idaho no longer use scrubbers (per Dennis Hunt with Gencor Industries, Inc., and Catherine Sutton of Astec, Inc.)

ii. Baghouses are capable of providing ≥ 99% control of PM_{10}, i.e. metals control.

iii. The energy costs related to a baghouse system are less than those for scrubbers, per *Baghouse Applications* by Malcolm Swanson, P.E.

A drum mixer baghouse to control metal emissions meets the criteria for technological feasibility and will be considered for economic feasibility.

Regardless of the T-RACT determination, the permit requires the operation of a baghouse on the exit of the drum mixer. In most operating scenarios, PM_{10} emissions from the drum mixer are the determining factor in calculating setback distance. This distance is minimized when the emissions from the drum mixer are controlled to ≥ 99% by a baghouse. The metals, which exist as particulate in the flue gas exiting the drum mixer, would be collected by this device.

Recycle of particulate collected from drum mixer baghouse:

The permit also requires that the collected particulate be routed back to the drum mixer. In this manner, the metals that may be contained in the particulate are encapsulated into the hot mix and not released to the atmosphere.

Recycling of particulate collected from the drum mixer baghouse to control metal emissions meets the criteria for technological feasibility and will be considered for economic feasibility.

Drum mixer scrubber:

i. Particulate may be captured by a wet scrubber system. For a 130 T/day drum mixer, approximately 100 gallons per minute of water would be required. Particulate collection efficiency varies from 50 to 98% depending on particle size and pressure drop. The scrubbing water would be treated and recycled through some type of mechanical and/or chemical means. It is possible for a portable HMA to construct a wastewater collection system at each site. However, several of the major HMA plant manufacturers, including Gencor and Astec, no longer use scrubber control systems

ii. Wastewater stored in a pond would require on-going, supervised treatment, even after the HMA plant relocates. There is a possibility of ground water or surface water contamination.

iii. The energy costs related to waste water treatment vary depending on a variety of factors including: volume of water; concentration of pollutants in the water; weather; and pond design.

A drum mixer scrubber to control metal emissions meets the criteria for technological feasibility and will be considered for economic feasibility.

Review of the EPA RACT/BACT/LAER Clearinghouse (RBLC) Review for Metals

The engineering consulting firm CH2MHill, Boise, has presented this review to the Department on behalf of their clients on several previous occasions. The Department continues to be satisfied with the completeness of this review as submitted.

"A review of technologies for the control of chromium, arsenic and nickel was performed. The Environmental Protection Agency (EPA) RBLC was reviewed for a 10 year look-back period to determine the types of controls that have been required on similar sources. The RBLC is a compilation of existing and proposed control technologies, permit limits, and emission estimates for a very wide variety of process and emission point sources in the U.S. This database was developed and is maintained by the EPA to provide information on emissions control technology and other information for air pollutants and is regularly updated by EPA and state regulatory agencies to reflect the current state of controls. The RBLC was reviewed for HMA plants and searched for other related categories, such as external combustion. The categories searched of the in the RBLC were:

- Asphalt Concrete Manufacturing
- Asphalt Processing
- Liquid Fuel & Liquid Fuel Mixtures (< 100 million Btu/hr)
- Distillate Fuel Oil (ASTM # 1,2, includes kerosene, aviation, diesel fuel)
- Other Liquid Fuel & Liquid Fuel Mixtures

- Other Fuel and Combinations (< 100 million Btu/hr)

For each category listed above, the RBLC was used to search for records relating to the control of arsenic and chromium specific to asphalt processing and manufacturing (mineral products) or related to fuel combustion. Based on a 10 year review of related sources, no controls were identified for HMA plants for the control of chromium, arsenic and nickel. A copy of the results of the RBLC search was included in the April, 2008 permit application submitted to DEQ. Based on the search, removal controls for chromium, arsenic and nickel were not determined to be present in the source categories and no additional controls, beyond the high-efficiency baghouse are considered reasonable."

DEQ is satisfied that the review results for the metal particulates of chromium, arsenic and nickel is also appropriate for cadmium metal particulate.

Organic Control Technological Feasibility

Options considered for technological feasibility:

- Good combustion practices on all combustion devices
- Covered conveyors from the drum mixer to the silo or load-out points
- Thermal oxidizer on the asphalt storage silo
- Thermal oxidizer following the drum mixer baghouse

Good combustion practices on all combustion devices:

i. Fuel cost is one of the major expenses at any HMA plant. Efficient combustion reduces costs, while also reducing organic emissions. Process operation and maintenance procedures are in place to ensure good combustion practices.

ii. The practice of good combustion practices does not adversely impact the environment.

iii. Good combustion practices reduce energy costs.

Good combustion practices on all combustion devices to control organic emissions meets the criteria for technological feasibility and will be considered for economic feasibility.

Covered conveyors from the drum mixer to the silo or load-out points:

Organics, generally referred to as "blue smoke", are generated by the hot asphalt product as it is conveyed from the drum mixer to the silo. Blue smoke is actually a haze of petroleum (organic) droplets suspended in the air.

i. Covering this conveyor protects the HMA product from airborne contaminants and helps to maintain the temperature of the HMA product.

ii. This covering and reduces the droplets from escaping to the environment. It is considered an inexpensive "good neighbor" control for potential blue smoke.

iii. Construction of this covering may provide a slight energy savings.

Covering the conveyors from the drum mixer to the silo or load-out points to control organic emissions meets the criteria for technological feasibility and will be considered for economic feasibility.

Thermal oxidizer on the asphalt storage silo:

Incineration is one of the best known methods of industrial gas waste disposal. Incineration is the ultimate disposal method in that the objectionable combustible compounds in the waste gas are converted rather than collected. The heart of an incinerator system is a combustion chamber in which the organic-containing waste stream is burned. However, the energy released by the combustion of the organics is not sufficient to raise its own inlet temperature to the desired levels, so that supplemental air and auxiliary fuel must be added.

The use of a catalyst increases the reaction rate, enabling conversion at lower reaction temperature than in thermal incinerator units, and thereby lowering the fuel costs. However, particulate matter and the metals can rapidly blind the pores of catalysts and deactivate them over time. The use of a catalyst in a thermal oxidizer will not be further explored

i. The incinerator chamber and auxiliary equipment require their own foundations & supports, instrumentation, electrical, piping, insulation, and extensive handling & erection by specially trained personnel.

ii. The organics entering the oxidizer would be destroyed.

iii. This process requires additional energy. The auxiliary fuel of choice for a thermal oxidizer is natural gas because the combustion of any liquid fuels would create additional pollutants, including organic compounds.

Thermal oxidizer on the asphalt storage silo to control organic emissions **does not** meet the criteria for technological feasibility and only a brief discussion of economic feasibility will be presented.

Thermal oxidation following the drum mixer baghouse:

A thermal oxidizer could potentially be installed following the drum mixer baghouse. However, all of the concerns regarding this device on the silo apply to the baghouse exhaust as well.

Thermal oxidation following the drum mixer baghouse to control organic emissions **does not** meet the criteria for technological feasibility and only a brief discussion of economic feasibility will be presented.

EPA RACT/BACT/LAER Clearinghouse Review and AP-42

The engineering consulting firm CH2MHill, Boise, has presented this review to the Department on behalf of their clients on several previous occasions. The Department continues to be satisfied with the completeness of this review as submitted:

"A review of technologies for the control of formaldehyde, POM and PAH was performed. The Environmental Protection Agency (EPA) RACT/BACT/LAER Clearinghouse (RBLC) was reviewed to determine the types of controls that have been required on similar sources. The same source categories were reviewed for the pollutants, namely:

- Asphalt Concrete Manufacturing
- Asphalt Processing
- Liquid Fuel & Liquid Fuel Mixtures (< 100 million Btu/hr)
- Distillate Fuel Oil (ASTM # 1,2, includes kerosene, aviation, diesel fuel)
- Other Liquid Fuel & Liquid Fuel Mixtures

- Other Fuel and Combinations (<100 million Btu/hr)

This review returned one record for limitations of formaldehyde emissions, and no records for the specific control of POM/PAH.

Formaldehyde – Only one record for the control of emissions was found in the RBLC database. This record applied to a diesel generator which was assigned an emissions limit and no control equipment or work practice was required.

In addition to formaldehyde and POM/PAH discussed in the EPA RBLC investigation above, this T-RACT analysis needs to address the other organic compounds which exceeded the 586 ELs; i.e. acetaldehyde, benzene, and dioxins/furans. Because all organic compounds are the destroyed by the same devices, DEQ is satisfied that the review results for formaldehyde and POM/POH is appropriate for all organic compounds.

14. T-RACT Determination. T-RACT shall be determined on a case-by-case basis by the Department as follows: (continued)

d. The economic feasibility of a control technology or other requirement, including the costs of necessary mitigation measures, for a particular source shall be determined considering several factors including, but not limited to: *(5-1-94)*

i. Capital costs. *(5-1-94)*

ii. Cost effectiveness, which is the annualized cost of the control technology divided by the amount of emission reduction. *(5-1-94)*

iii. The difference in costs between the particular source and other similar sources, if any, that have implemented emissions reductions. *(5-1-94)*

Cost Analysis Metals

Additional treatment of used oil by the supplier:

A used oil vendor, Commercial Fuel in Nampa, Idaho was contacted by the engineering consulting firm CH2MHill, Boise, for the specific management of used oil to minimize the content of **chromium and arsenic**. Note that all chromium compounds, not the subset of hexavalent chromium, are considered in these cost calculations because 279.11 does not distinguish between the two.

Randy Blackburn of Commercial Fuel indicated that the used oil could be managed to minimize the metals content for an additional cost of $0.55/gallon.

A RFO fuel vendor, Gem State Oil Recovery in Kuna, Idaho was contacted by the engineering consulting firm CH2MHill, Boise, for the specific management of used oil to minimize the content of **nickel**. Doug Stowers of Gem State Oil Recovery indicated that the used oil could be managed to minimize the metals content for an additional cost of $0.55/gallon.

Minimum detection limits (MDLs) vary, even at the same laboratory and with the same equipment, due to calibration procedures. A review of used oil analysis online and submitted to the Department indicated MDLs between 0.5 and 1.0 ppm (mg/l). For consistency, the cost calculations are based on 1.0 ppm for each of the metals.

As shown in the following table, the reduction of the metal pollutant is calculated as the difference between the used oil as-received and the used oil after additional treatment. Because

279.11 does not specify a concentration for nickel, the cost analysis conclusions for the other metals is considered appropriate for nickel.

For details of this economic analysis, refer to the spreadsheet "Additional Treatment on Used Oil Cost Analysis" provided in Sub Appendix A. The results are summarized in the following table:

Table 3: Additional Treatment on Used Oil Cost Analysis

Pollutant	Capital Cost for Applicant ($)	Annualized Cost ($/lb reduction of pollutant)
Arsenic	0	$16,487
Cadmium	0	$65,947
Chromium	0	$7,327

Additional treatment on used oil to reduce metal particulate emissions is not considered economically feasible and therefore does not meet the economic requirements of T-RACT.

<u>Drum Mixer controls:</u>

Calculation of the cost effectiveness of each type of control equipment on metals exiting the drum mixer:

- Metal emissions entering the control device: the AP-42 uncontrolled emissions with fuel oil (Table 11.1-12).
- Metal emissions exiting the control device: the control device manufacturer's particulate control efficiencies
- Emission reductions and annual cost per ton of emission reduction: based on the difference between the emissions entering and exiting the device (as explained in the previous two bullets)

Equipment costs for both the baghouse and scrubbers systems were provided to the Department by Andy Guth of CEI Enterprises, Inc., an Astec Company. For cost details of this economic analysis, refer to the spreadsheet "Drum Mixer Baghouse and Scrubber Cost Analysis" provided in Sub Appendix B. The results are summarized in the following table:

Table 3: Drum Mixer Baghouse and Scrubber Cost Analysis

<table>
<tr><th rowspan="2">Pollutant</th><th colspan="2">Capital Cost</th><th colspan="2">Annualized Cost ($/lb reduction of pollutant)</th></tr>
<tr><th>Baghouse</th><th>Scrubber</th><th>Baghouse</th><th>Scrubber</th></tr>
<tr><td>Arsenic</td><td rowspan="4">$264,990</td><td rowspan="4">$231,110</td><td>$284,750</td><td>$281,220</td></tr>
<tr><td>Cadmium</td><td>$94,917</td><td>$93,740</td></tr>
<tr><td>Hexavalent chromium</td><td>$14,987</td><td>$15,623</td></tr>
<tr><td>Nickel</td><td>$284</td><td>$289</td></tr>
</table>

Cost effectiveness:

The Department is satisfied that the operation of a baghouse on the drum mixer to reduce metal particulate meets the T-RACT criteria for economic feasibility.

As explained in the Statement of Basis, this permit requires the operation of a baghouse on the drum mixer with ≥ 99% control efficiency of PM_{10}.

Cost Analysis Organic Control

Covered conveyors from the drum mixer to the silo or load-out points:

As discussed in "Organics Control – Technological Feasibility", covered conveyors from the drum mixer to the silo or load-out points to control organic emissions meets the T-RACT criteria for technological feasibility and will be considered for economic feasibility.

Covered conveyors are a standard on most HMA plant systems in order to shield the HMA product from the weather, maintain temperature, and minimize the release of organic droplets. Cost itemization for the covering and the exact quantity of emissions reduction is not provided with manufacturer quotes. The quote does specify that the cover is composed of a series of hinged steel plates, about 18 inches wide over the length of the conveyor.

For this T-RACT analysis, the following table is considered by the Department to be reasonable:

Table 4: Covered Conveyors from the Drum Mixer to the Silo or Load-out Points Cost Analysis

Pollutant	Capital Cost	Annualized Cost ($/lb reduction of pollutant)
Organic	minimal	Negligible

Cost effectiveness:

The Department is satisfied that the cost of covering the conveyor(s) from the drum mixer to the silo or load-out point to reduce organic emissions meets the T-RACT criteria for economic feasibility.

Thermal Oxidizer on the Silo or Load-Out Points and Thermal Oxidation Following the Drum Mixer Baghouse

As discussed in "Organics Control – Technological Feasibility", installing a thermal oxidizer on either the silo or load-out points or the discharge of a drum mixer baghouse to control organic emissions **does not** meet the criteria for technological feasibility for this T-RACT analysis. However, a brief discussion of economic feasibility is presented.

The engineering consulting firm CH2MHill, Boise contacted the vendor Baker Furnace, in Yorba Linda CA, (Gabe Trinidad, 800-237-5675) for information regarding a thermal oxidizer on the silo or load-out points. The following information was presented in multiple permit applications in 2008 and 2009:

- The capital cost estimate to accommodate 5,000 acfm was $462,875 (2005$).
- Annualized cost was $171,684 (2005$)

To obtain an order of magnitude cost estimate, the above annualized cost (based on a different size asphalt storage silo) and formaldehyde (at 0.018 lb/hr, the 586 pollutant with the highest concentration discharged from the drum mixer, as presented in Table 1) on the silo or load-out points.

Table 5: Thermal Oxidizer on the Silo or Load-out Points Cost Analysis

Pollutant	Capital Cost	Annualized Cost ($/lb reduction of pollutant)
Formaldehyde	$462,875	$25,715,278

The engineering consulting firm CH2MHill, Boise contacted the vendor CMM Group, DePere WI, (David Martin, 920-336-9800) for information regarding a thermal oxidizer on the discharge of the drum mixer. The following information was presented in multiple permit applications in 2008 and 2009:

- The capital cost estimate to accommodate 35,000 acfm at 1400-1600 °F was $425,000 (2005$).
- Annualized cost was $452,355

To obtain an order of magnitude cost estimate, the above annualized cost (based on a different size drum mixer) and formaldehyde (at 0.018 lb/hr, the 586 pollutant with the highest concentration discharged from the drum mixer, as presented in Table 1) are used to calculate the annualized cost of installing thermal oxidation following the drum mixer.

Table 6: Thermal Oxidizer on the Discharge of the Drum Mixer Baghouse Cost Analysis

Pollutant	Capital Cost	Annualized Cost ($/lb reduction of pollutant)
Formaldehyde	$786,888	$43,716,000

Cost effectiveness:

Thermal oxidation on the asphalt to control organic emissions **does not** meet the criteria for economic feasibility. Thermal oxidation on the exhaust of the drum mixer baghouse to control organic emissions **does not** meet the criteria for economic feasibility.

14. T-RACT Determination. T-RACT shall be determined on a case-by-case basis by the Department as follows: (continued)

e. If the Department determines that the applicant has proposed T-RACT, the Department shall determine which of the options, or combination of options, will result in the lowest emission of toxic air pollutants, develop the emission standards constituting T-RACT and incorporate the emission standards into the permit to construct. *(5-1-94)*

f. If the Department determines that the applicant has not proposed T-RACT, the Department shall disapprove the submittal. If the submittal is disapproved, the applicant may *supplement its submittal or demonstrate preconstruction compliance through a different method provided in Section 210. If the applicant does not supplement its submittal or demonstrate preconstruction compliance through a different method provided in Section 210, the Department shall deny the permit.* *(6-30-95)*

Based on this T-RACT analysis, the Department has determined that the proposed control technologies constitute T-RACT for this permit.

Table 7: Permit Conditions that Assure Compliance with Toxic Standards

TAP	Contributing source	Permit conditions
Metals	Drum mixer	Used oil (RFO) meeting the specifications of 279.11
Metals	Drum mixer	Use of baghouse with ≥99% PM_{10} control
Metals	Drum mixer	Recycling of particulate collected from the baghouse back to the drum mixer
Organics (formaldehyde)	Drum mixer and loadout and silo-filling	Use of a covered conveyor from the drum mixer to the loadout and silo-filling

T-RACT for IC Engines:

All applicants who choose to permit a portable asphalt plant are required to comply with 40 CFR 60 Subpart IIII or 40 CFR 63 Subpart ZZZZ. Both of these subparts are intended to reduce emissions, including Idaho TAP/HAP emissions from engines through emission standards, fuel limitations and specific operation and maintenance procedures.

Per IDAPA 58.01.01.210.20 compliance with these two MACT subparts constitutes T-RACT for the IC engines.

T-RACT Analysis
Sub Appendix A

Additional Treatment of Used Oil Cost Analysis

Used Oil Treatment - Permitted Only in the Drum Mixer

The Drum Mixer is controlled by a baghouse with ≥ 99% PM10 collection efficiency. This PM10 includes metal particulate.
The purpose of this T-RACT cost analysis is to determine if it is practical to further reduce metal emissions by treating the used oil .

Metals addressed by T-RACT analysis - Arsenic, Cadmium, Hexavalent Chromium, Nickel

Note: Hexavalent Chromium exceeds the EL. However 279.11 specifies chromium, not hexavalent chromium.
Hexavalent chromium is <10% of the total chromium.

Cost of Fuel

Standard Cost (40 CFR 279.11)	$1.10 per gallon*
Fuel Treated to Minimum Detection Limit	$1.65 per gallon*
Cost of treatment	$0.55 per gallon

Basis: Metals content as-recieved
For Arsenic, Cadmium, and Chromium, as received = 279.11 specifications
Nickel: there is no 279.11 specification; analysis not included in the as-received documentation.

MDL: Minimum detection limit by laboratories

Reduction: ppm = Difference between as-received (ppm) and MDL (ppm)
Reduction: lb/gal = reduction (ppm) *conversion factor 8.34E-06 lb/gal = 1 ppm

Reduction cost per ton of pollutant: Cost ($0.55/gal) / Reduction (lb/gal)

Pollutant	As-received (ppm)	MDL (ppm)	Reduction (ppm)	Reduction (lb/gal)	Reduction cost ($/lb)
Arsenic	5	1	4	3.34E-05	$16,487
Cadmium	2	1	1	8.34E-06	$65,947
Chromium	10	1	9	7.51E-05	$7,327

*Cost of additional treatment quoted to the engineering consulting firm CH2M Hill and submitted to DEQ via permit applications.
Nickel - Doug Stowers - Gem State Oil Recovery - Kuna, Idaho
Arsenic and chromium - Randy Blackburn of Commercial Fuel - Nampa, Idaho

T-RACT Analysis
Sub Appendix B

Drum Mixer Baghouse and Scrubber Cost Analysis

130 T/hr Drum Mixer - Bag House T-RACT Cost Analysis

Cost Item	Multiplier	Cost	
Direct Purchase Costs			
Fabric filter baghouse cost, A*** (includes bags and auxilary equipment)		$100,000	Note: Approximate estimated cost
Instrumentation, 0.1 x A	10.00%	$10,000	
Sales tax, 0.06 x A	6.00%	$6,000	
Freight, 0.05 x A	5.00%	$5,000	
Purchased equipment cost "B" is the cost of the baghouse + instrumentation + sales tax + freight		**$121,000**	
Direct Installation Costs			
Foundation and supports, 0.04 x B	4.00%	$4,840	
Handling and erection, 0.50 x B	50.00%	$60,500	
Electrical, 0.08 x B	8.00%	$9,680	
Piping, 0.01 x B	1.00%	$1,210	
Insulation for ductwork, 0.07 x B	7.00%	$8,470	
Painting, 0.04 x B	4.00%	$4,840	
Direct installation costs total		**$89,540**	
Site preparation, N/A		$0	
Facilities and buildings, N/A		$0	
Total Direct Costs		**$210,540**	
Indirect costs (installation)			
Engineering, 0.10 x B	10.00%	$12,100	
Construction and field expenses, 0.20 x B	20.00%	$24,200	
Contractor fees, 0.10 x B	10.00%	$12,100	
Startup, 0.01 x B	1.00%	$1,210	
Performance test, 0.01 x B	1.00%	$1,210	
Contingencies, 0.03 x B	3.00%	$3,630	
Total Indirect Costs		**$54,450**	
Total Capital Investment (TCI) is the Total Direct Costs + Total Indirect Costs		**$264,990**	
Direct Annual Costs, DC			
Operating labor cost (assumption)	$35.00/hr		
Annual operation (assumption)	6,000 hrs/yr		
Operating labor cost (assumed to be 25% of annual operation, 2 hrs per 8 hr shift)	25.00%	$52,500	
Supervisory labor cost (15% of operating labor)	15.00%	$7,875	
Operating materials cost	N/A	$0	
Maintenance labor cost (assumed to be 18.75% of annual operation, 1-2 hr per 8 hr shift, thus an average of 1.5 hrs per 8 hr shift)	18.75%	$39,375	

Maintenance material cost (assumed to be 100% of maintenance labor cost)	100.00%	$39,375
Bag replacement labor (assumed to be 10 min per bag = 0.1667 hrs/bag)	0.1667 hrs/bag	
Number of bags in the baghouse (assumption)	576 bags	
Fixed bag replacement cost (assumption)	$20,000	
Captial Recovery Factor	0.5531	
Replacement parts cost [(Labor rate x time to replace each bag x number of bags) + Replacement parts cost] x Capitol Recovery Factor		$12,921
Air Flowrate (ACFM)	22,000	
Static pressure drop (assumed to be 10 in-H2O)	10	
Conversion from air flow and static pressure drop to power	0.000181	
Hours per year of operation	6,000	
Utilities price	0.07 $/kW-hr	
Utilities cost (Air flow rate x static pressure drop x conversion factor x hours per year of operation x utilities cost)		$16,724
Waste disposal	N/A since all PM (metals) is recycled back to drum	$0
Total Direct Annual Costs		**$168,770**
<u>Indirect Annual Costs</u>		
Overhead, 60% of the sum of operating, supvisory & maintenance labor and maintenance materials	60.00%	$83,475
Administrative charges, 2% of TCI	2.00%	$5,300
Property tax, 1% of TCI	1.00%	$2,650
Insurance, 1% of TCI	1.00%	$2,650
Capital recovery, 0.09439 x (TCI - cost of the bags - installation labor)	9.439%	$21,905
Total Indirect Annual Costs		**$115,980**
Total Annual Cost is Total Direct Annual Costs + Total Indirect Annual Costs		**$284,750**

<u>Annual Cost Per Ton of Pollutant Removed</u>

Pollutant	**Pounds per year of pollutant controlled by the baghouse (99% control)**	**Annual Cost to capture pollutant ($/lb)**
Arsenic	1	**284,750 $/lb**
Cadmium	3	**94,917 $/lb**
Hexavalent Chromium	19	**14,987 $/lb**
Nickel	1,004	**284 $/lb**

*Reference:
EPA AIR POLLUTION CONTROL COST MANUAL
Sixth Edition January 2002
EPA/452/B-02-001

United States Environmental Protection Agency
Office of Air Quality Planning and Standards
Research Triangle Park, North Carolina 27711
Section 6 Particulate Matter Controls, Chapter 1
Baghouses and Filters
Fabric Filter System Example Problem Table 1.10,
pgs 1-55, 56
Fabric filter, A ***

Vendor quotes from: CEI Enterprises, Inc., An Astec Company
CEI Proposal # 10-421
Dated October 2, 2010

130 T/hr Drum Mixer - Scrubber T-RACT Cost Analysis

Cost Item	Multiplier	Cost
Direct Purchase Costs		
Venturi Packaged Unit, A1*		$100,000
Instrumentation, 0.1 x A	10.00%	$10,000
Sales tax, 0.06 x A	6.00%	$6,000
Freight, 0.05 x A	5.00%	$5,000
Purchased equipment cost "B"is the cost of the baghouse + instrumentation + sales tax + freight		**$121,000**
Direct Installation Costs		
Foundation and supports, 0.06 x B	6.00%	$7,260
Handling and erection, 0.40 x B	40.00%	$48,400
Electrical, 0.01 x B	1.00%	$1,210
Piping, 0.05 x B	5.00%	$6,050
Insulation for ductwork, 0.03 x B	3.00%	$3,630
Painting, 0.01 x B	1.00%	$1,210
Direct installation costs total		**$67,760**
Site preparation**		$0
Facilities and buildings**		$0
Total Direct Costs		**$188,760**
Indirect costs (installation)		
Engineering, 0.10 x B	10.00%	$12,100
Construction and field expenses, 0.10 x B	10.00%	$12,100
Contractor fees, 0.10 x B	10.00%	$12,100
Startup, 0.01 x B	1.00%	$1,210
Performance test, 0.01 x B	1.00%	$1,210
Contingencies, 0.03 x B	3.00%	$3,630
Total Indirect Cost		**$42,350**
Total Capital Investment (TCI) is Total Direct Costs + Total Indirect Costs		**$231,110**
Direct Annual Costs, DC		
Operating labor cost (assumption)	$35.00/hr	
Annual operation (assumption)	6,000 hrs/yr	
Operating labor cost (assumed to be 25% of annual operation, 2 hrs per 8 hr shift)	25.00%	$52,500
Supervisory labor cost (15% of operating labor)	15.00%	$7,875
Operating materials cost**		$0
Maintenance labor cost (assumed to be 18.75% of annual operation, 1-2 hr per 8 hr shift, thus an average of 1.5 hrs per 8 hr shift)	18.75%	$39,375
Maintenance material cost (assumed to be 100% of maintenance labor cost)	100.00%	$39,375
Liquor pump power rating	10.00 hp	
Auger pump power rating	3.00 hp	

Fan power rating	75.00 hp	
Conversion from horsepower to kW	0.7457	
Utilities price	0.07 $/kW-hr	
Utilities cost (electricity), annual operation x motor rating x electricty cost		$27,561
Total Direct Annual Costs		**$166,686**

Indirect Annual Costs

Overhead, 60% of the sum of operating, supvisory & maintenance labor and maintenance materials	60.00%	$83,475
Administrative charges, 2% of TCI	2.00%	$4,622
Property tax, 1% of TCI	1.00%	$2,311
Insurance, 1% of TCI	1.00%	$2,311
Capital recovery, 0.09439 x TCI	9.439%	$21,814
Total Indirect Annual Costs		**$114,534**

Total Annual Cost is Total Direct Annual Costs + Total Indirect Annual Costs	**$281,220**

Annual Cost Per Ton of Pollutant Removed

Pollutant	Pounds per year of pollutant controlled by the scrubber (96% control)	Annual Cost to capture pollutant ($/lb)
Arsenic	1	**281,220 $/lb**
Cadmium	3	**93,740 $/lb**
Hexavalent Chromium	18	**15,623 $/lb**
Nickel	973	**289 $/lb**

*Reference:
EPA AIR POLLUTION CONTROL COST MANUAL
Sixth Edition - January 2002
EPA/452/B-02-001
United States Environmental Protection Agency
Office of Air Quality Planning and Standards
Research Triangle Park, North Carolina 27711
Section 6, Particulate Matter Controls, Chapter 2,
Wet Scrubbers for Particulate Matter
Table 2.8 and 2.9

**Section 2.3.5, Waste Liquid Collection and Disposal, states that due to the high variability of disposal costs, i.e. laboratory analysis, transportation costs, and the cost of treatment, destruction, landfill, or other disposal metod of the spent scrubber water, these costs are not included as part of annual costs in this document.

Vendor quotes from: CEI Enterprises, Inc., An Astec Company
CEI Proposal # 10-421
Dated October 2, 2010

APPENDIX D – FACILITY DRAFT COMMENTS

The following comments were received from the facility on February 11, 2011:

Facility Comment: In Table 1 in the draft permit, for controls on the material transfer points include maintenance of moisture content of the aggregate material ¼ inch and smaller.

DEQ Response: The requested change will be made to the permit.

Facility Comment: For draft permit condition 4, include additional fugitive dust control options as mentioned previously.

DEQ Response: The requested change will be made to the permit.

Facility Comment: For draft permit condition 17, change "load-out stack" to "load-out station" and change "silo filing" to "silo filing slat conveyor."

DEQ Response: The requested change will be made to the permit.

Facility Comment: For draft permit condition 34, include "or a certification statement from the used oil supplier that the shipment meets the used oil specifications."

DEQ Response: The requested change will be made to the permit.

Facility Comment: For draft permit condition 34, remove the flashpoint requirement.

DEQ Response: The requested change will not be made to the permit because this a used oil specification required by 40 CFR 279.11.

APPENDIX E – PROCESSING FEE

PTC Fee Calculation

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

Company: Aggregate Industries SWR
Address: 3100 E. Craig Rd.
City: N. Las Vegas
State: NV
Zip Code: 89030
Facility Contact: Mark Miller
Title: Environmental Manager
AIRS No.: 777-00498

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

Y Did this permit require engineering analysis? Y/N

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

Emissions Inventory			
Pollutant	Annual Emissions Increase (T/yr)	Annual Emissions Reduction (T/yr)	Annual Emissions Change (T/yr)
NO_X	19.1	0	19.1
SO_2	4.5	0	4.5
CO	13.3	0	13.3
PM10	2.7	0	2.7
VOC	3.2	0	3.2
TAPS/HAPS	0.7	0	0.7
Total:	0.0	0	**43.6**
Fee Due	**$ 5,000.00**		

Comments: