TECHNICAL SUPPORT DOCUMENT

Air Discharge Permit ADP 22-3538
Air Discharge Permit Application CL-3204

Issued: August 29, 2022

Lakeside Industries, Inc. - Orchards Asphalt Plant

SWCAA ID - 2049

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Southwest Clean Air Agency

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ABBREVIATIONS

List of Acronyms

ADP	Air Discharge Permit
AP-42	Compilation of Emission Factors, AP-42, 5th Edition, Volume 1, Stationary Point and Area Sources – published by EPA
ASIL	Acceptable Source Impact Level
BACT	Best available control technology
CAM	Compliance Assurance Monitoring
CAS#	Chemical Abstracts Service registry number
CFR	Code of Federal Regulations
EPA	U.S. Environmental Protection Agency
EU	Emission Unit
mfr	Manufacturer
NESHAP	National Emission Standards for Hazardous Air Pollutants
NOV	Notice of Violation/
NSPS	New Source Performance Standard
PSD	Prevention of Significant Deterioration
RCW	Revised Code of Washington
SCC	Source Classification Code
SDS	Safety Data Sheet
SQER	Small Quantity Emission Rate listed in WAC 173-460
Standard	Standard conditions at a temperature of 68°F (20°C) and a pressure of 29.92 in Hg (760 mm Hg)
SWCAA	Southwest Clean Air Agency
T-BACT	Best Available Control Technology for toxic air pollutants
WAC	Washington Administrative Code

List of Units and Measures

µg/m³	Micrograms per cubic meter
µm	Micrometer (10^{-6} meter)
acfm	Actual cubic foot per minute
dscfm	Dry Standard cubic foot per minute
g/dscm	Grams per dry Standard cubic meter
gpm	Gallon per minute
gr/dscf	Grain per dry standard cubic foot
MMBtu	Million British thermal unit
MMcf	Million cubic feet
ppm	Parts per million
ppmv	Parts per million by volume
ppmvd	Parts per million by volume, dry
ppmw	Parts per million by weight
psig	Pounds per square inch, gauge
rpm	Revolution per minute
scfm	Standard cubic foot per minute
tph	Ton per hour
tpy	Tons per year

List of Chemical Symbols, Formulas, and Pollutants

C_3H_8	Propane	PM_{10}	PM with an aerodynamic diameter 10 µm or less
CO	Carbon monoxide	$PM_{2.5}$	PM with an aerodynamic diameter 2.5 µm or less
CO_2	Carbon dioxide	SO_2	Sulfur dioxide
CO_2e	Carbon dioxide equivalent	SO_x	Sulfur oxides
HAP	Hazardous air pollutant listed pursuant to Section 112 of the Federal Clean Air Act	TAP	Toxic air pollutant pursuant to Chapter 173-460 WAC
NO_x	Nitrogen oxides	VOC	Volatile organic compound
O_2	Oxygen		
O_3	Ozone		
PM	Particulate Matter with an aerodynamic diameter 100 µm or less		

Terms not otherwise defined have the meaning assigned to them in the referenced regulations or the dictionary definition, as appropriate.

1. FACILITY IDENTIFICATION

Applicant Name:	Lakeside Industries, Inc.
Applicant Address:	P.O. Box 7016, Issaquah, WA 98027
Facility Name:	Lakeside Industries, Inc. – Orchards Asphalt Plant
Facility Address:	8705 NE 117th Avenue, Vancouver, WA 98662
SWCAA Identification:	2049
Contact Person:	Karen Deal, Environmental Director
Primary Process:	Hot Mix Asphalt Manufacturing
SIC/NAICS Code:	2951: Paving Mixtures and Blocks 324121: Asphalt Paving Mixture and Block Manufacturing
Facility Classification:	Natural Minor

2. FACILITY DESCRIPTION

Lakeside Industries, Inc. (Lakeside) operates a portable hot mix asphalt facility in the Orchards Pit in Vancouver, Washington. Approved operations at the facility include a continuous drum mix asphalt plant, asphaltic oil storage, and aggregate handling and storage.

3. CURRENT PERMITTING ACTION

This permitting action is in response to Air Discharge Permit application number CL-3204 (ADP Application CL-3204) dated July 12, 2022. Lakeside submitted ADP Application CL-3204 requesting approval of the following:

- Increase the maximum allowable temperature of the asphalt mixture at the exit of the HMA plant drum mixer from 315 °F to 325 °F; and
- Modify the existing emission control configuration to redirect the vapors and gases collected from the asphalt mixture transfer and storage silo filling system from the Blue Smoke baghouse to the flame zone of the drum dryer/mixer burner.

The current permitting action provides approval for the process changes proposed in ADP Application CL-3204. ADP 22-3538 will supersede ADP 11-2994 in its entirety.

4. PROCESS DESCRIPTION

4.a Hot Mix Asphalt Production (*modified*). The plant utilizes a double barrel drum mix configuration where aggregate enters the inner drum and is dried and heated prior to entering the outer drum where liquid asphalt cement and recycled materials are added. The plant currently operates on natural gas but may also fire on #2 fuel oil. Emissions from the asphalt plant's aggregate dryer/mixer are exhausted to a dedicated baghouse.

ADP Application CL-3204. Lakeside proposes to increase the existing asphalt production temperature limit from 315 °F to 325 °F.

4.b Asphaltic Concrete Storage (*modified*). Finished asphaltic concrete is stored onsite in three elevated silos. Asphaltic concrete is transferred to the silos via enclosed conveyor. Stored material is dropped directly into trucks through clamshell gates in the bottom of each silo. Fugitive smoke and odor emissions from asphalt transfer to the storage silos and truck loadout are captured and vented to a Blue Smoke baghouse system.

ADP Application CL-3204. Lakeside proposes to modify the existing emission control system to vent fugitive smoke and odor emissions from asphalt transfer to the storage silos and silo tops to the flame zone of the aggregate dryer instead of the Blue Smoke baghouse system. This modification is necessary due to higher aggregate moisture levels, which have reduced the effectiveness of the Blue Smoke baghouse system.

4.c Aggregate Handling and Storage (*existing*). The hot mix asphalt facility includes aggregate handling and storage operations. Aggregate is received at the facility via truck. Aggregate is stored in open piles prior to use. A series of screens, conveyors, and storage hoppers are employed to segregate the aggregate and feed the proper blend of material sizes into the asphalt plant.

4.d Asphaltic Oil Storage (*existing*). Asphaltic oil is stored onsite in heated aboveground storage tanks. The maximum storage temperature of the asphaltic oil is specified as 315 ºF. Storage tank temperature is maintained using electric heating jackets and an electrically heated thermal oil loop. Emissions from the storage tanks are controlled by a Blue Smoke baghouse control system.

5. EQUIPMENT/ACTIVITY IDENTIFICATION

5.a. Hot Mix Asphalt Plant (*existing*).
Production Capacity: 400 tons per hour

Aggregate Dryer Details

Make:	Astec
Dryer Capacity:	400 tons per hour
Burner Make/Model:	Hauck / Eco-Star ES-150
Burner Capacity:	150 MMBtu/hr
Burner Fuel:	Natural Gas / #2 Diesel

Baghouse Details

Make/ Model:	Astec / RBH-87:BD (reverse jet pulse system with horizontal cyclone on inlet)
Number of Bags:	1,280
Bag Material:	14 oz/yd^2 P-84 Nomex fabric
Filter Area:	15,488 square feet
Exhaust Flow Rate:	~ 33,200 dscfm
Stack Description:	50.25" dia vertical stack exhausting at ~30.25' above ground level

5.b. Asphalt Oil Storage (*existing*). Asphalt oil is stored in two 30,000 gallon above-ground heated storage tanks. Emissions from the storage tanks are vented to the Blue Smoke Baghouse.

5.c. Asphalt Storage/Load-out (*modified*). One Astec model NG-3-60DC long-term storage system consisting of three 200-ton storage silos used to store finished asphalt. Each silo is equipped with a "batcher" that collects fresh asphalt from the feed conveyor, and then drops the material into the silo as a single mass. The current batchers have a 3 ton capacity. The batchers are a common piece of equipment at asphalt plants with large storage silos. The batchers aid in maintaining material specifications. Fumes from the asphalt storage silos and the load-out area are collected and vented to the Blue Smoke baghouse system.

ADP Application CL-3204. Lakeside proposes to modify asphalt handling conveyors (hot leg) and asphalt storage silos to vent fumes to the flame zone of the aggregate dryer instead of the Blue Smoke baghouse system. The truck load-out area will continue to be vented to the Blue Smoke baghouse system.

5.d Blue Smoke Baghouse System (*modified*). One Blue Smoke baghouse system used to collect asphalt fume (blue smoke) and any residual dust from asphalt oil storage, asphalt handling (enclosed hot leg and silo tops), the asphalt storage silos, and asphalt loadout. Sorbent is injected into the baghouse inlet to collect asphalt fume. Approximately 32 pounds of material is initially loaded into the system and then recycled until spent. There is no continuous material removal from the baghouse. The following equipment details were provided:

Make / Model:	Dustex / D3430
Design Flowrate:	25,000 scfm @ 70°F
Filter Area:	1,539 ft^2
Filter Bags:	98
Filtration Media:	16 oz/yd^2 polyester fabric
Cleaning Method:	Pulse-jet
Sorbent Material:	Diatomaceous earth
Exhaust Description:	~35" x 35" vertical stack exhausting at ~14.7' above grade

ADP Application CL-3204. Lakeside proposes to modify the Blue Smoke baghouse system to collect smoke and odor emissions from only the asphalt oil storage tanks and truck load-out area. Emissions from asphalt handling and the storage silos will be vented to the flame zone of the aggregate dryer.

5.e Hot Oil Heater (*existing*). One helical coil oil heater used to provide process heat to a hot oil loop that maintains operating temperature in the asphalt oil piping and storage tanks, asphalt conveyors, and asphalt storage silos.

Boiler Make / Model:	Heatec / HC-120
Burner Make/Model:	Power Flame / C2-GO-15 (s/n 079990175)
Heat Input Rating:	1.412 MMBtu/hr
Fuel:	Natural Gas (1,412 ft^3/hr) / #2 Diesel (~10 gal/hr)
Exhaust Stack:	6" dia vertical stack exhausting at 10' above grade.

5.f Equipment/Activity Summary.

ID No.	Equipment/Activity	Control Equipment/Measure
1	Hot Mix Asphalt Plant	Process Temperature Limit, Thermal Oxidation, Fabric Filtration
2	Asphalt Oil Storage	Blue Smoke Baghouse
3	Asphalt Storage, Transfer and Load-out	Equipment Enclosure, Process Temperature Limit, Thermal Oxidation, Blue Smoke Baghouse
4	Hot Oil Heater	Low Sulfur Fuel
5	Fugitive Dust Sources (Haul Roads, Aggregate Handling/Storage)	Low Pressure Wet Suppression

6. EMISSIONS DETERMINATION

Emissions to the ambient atmosphere from operations proposed in ADP Application CL-3204 consist of nitrogen oxides (NO_x), carbon monoxide (CO), volatile organic compounds (VOC), particulate matter (PM) sulfur dioxide (SO_2), toxic air pollutants (TAPs), and hazardous air pollutants (HAPs).

Unless otherwise specified by SWCAA, actual emissions must be determined using the specified input parameter listed for each emission unit and the following hierarchy of methodologies:

(a) Continuous emissions monitoring system (CEMS) data;
(b) Source emissions test data (EPA reference method). When source emissions test data conflicts with CEMS data for the time period of a source test, source test data must be used;
(c) Source emissions test data (other test method); and
(d) Emission factors or methodology provided in this TSD.

6.a Hot Mix Asphalt Plant (*existing).* Emissions from the asphalt plant while firing on natural gas or fuel oil (diesel) result from the combustion of natural gas and diesel, dust from the aggregate, and volatile organic compounds (including some toxic air pollutants) volatilized from the asphalt oil. Potential hourly emissions were calculated using the maximum rated production rate of the plant (400 tons per hour). Potential annual emissions for each fuel type were calculated using the 500,000 ton per year asphalt production limit as the basis. Consistent with SWCAA permitting policy, emission factors for toxic air pollutants with a factor rating of 'C' or less were not considered in this review.

Annual emissions will be calculated based on actual asphalt production using the methodology below.

Hot Mix Asphalt Plant - Natural Gas Firing

Heat Rate =	150	MMBtu/hr
Maximum Production Rate	400	tons per hour
Total Asphalt Production =	500,000	tons
Natural Gas Heat Value =	1,020	Btu/scf for AP-42 emission factors
Natural Gas Heat Value =	1,028	Btu/scf for 40 CFR 98 GHG emission factors
Natural Gas Consumption =	147,059	scfh (AP-42 factors)
Stack Flow =	53,597	dscfm @ max production rate, 15% O_2
Stack Concentration of Filte	0.010	gr/dscf
Natural Gas Consumption =	182.393	MMscf
Assumed Firing Rate =	250,000	Btu/ton HMA
Fuel Factor =	8,710	dscf/MMBtu

Pollutant	ppmvd @ 15% O_2	Emission Factor lb/ton	lb/hr	tpy	Emission Factor Source
NO_X	32	0.029	11.6	7.25	EcoStar Avg. + ~20%
CO	181	0.102	40.7	25.41	EcoStar Avg.
VOC		0.032	12.8	8.00	AP-42 Sec. 11.1 (3/04)
SO_X as SO_2		0.00022	0.1	0.06	Mass balance
Filterable $PM/PM_{10}/PM_{2.5}$		0.0115	4.6	2.87	Based on 0.01 gr/dscf @ 15% O_2
Condensible PM		0.019	7.8	4.85	AP-42 Sec. 11.1 (3/04)
Total PM		0.031	12.4	7.72	Sum of filterable and condensible
PM_{10}		0.031	12.4	7.72	Sum of filterable and condensible
$PM_{2.5}$		0.031	12.4	7.72	Sum of filterable and condensible
Benzene		0.00039	0.2	0.10	AP-42 Sec. 11.1 (3/04)
Formaldehyde		0.0015	0.6	0.38	Source test by Pac Rock

Greenhouse Gases	kg/MMBtu	GWP	CO_2e lb/MMBtu	CO_2e lb/MMscf	tpy, CO_2e	
CO_2	53.02	1	116.89	120,162	10,958	40 CFR 98
CH_4	0.0090	25	0.493	507.15	46	AP-42 Table 11.1-6 (3/04)
N_2O	0.0001	298	0.066	67.54	6	40 CFR 98
Total GHG - CO_2e	53.03		117.448	120,737	11,011	

[1] The filterable PM emission factor is based on the permit limit of 0.01 gr/dscf @ 15% O_2 and the maximum air flow through the baghouse (~32,940 dscfm at 11.3% O_2 - note that PM concentration must be corrected for the O_2 concentration at the measured flow to calculate maximum potential emissions).
[2] All PM is expected to have an aerodynamic diameter of 2.5 µm or less.

Hot Mix Asphalt Plant - Fuel Oil Firing

Heat Rate =	150	MMBtu/hr
Maximum Production Rate =	400	tons per hour
Total Asphalt Production =	500,000	tons
Stack Flow =	53,597	dscfm @ max production rate, 15% O_2
Stack Conc. of Filterable PM =	0.010	gr/dscf
Fuel Oil Sulfur Content =	0.0015%	by weight
Fuel Oil Density =	7.206	lb/gallon
Fuel Heat Content =	138,000	Btu/gallon (for use with GHG factors from 40 CFR 98)
Fuel Consumption =	1,358,696	gallons

Pollutant	Emission Factor lb/ton	lb/hr	tpy	Emission Factor Source
NO_X	0.062	24.8	15.50	Manufacturer
CO	0.060	24.0	15.00	Manufacturer
VOC	0.032	12.8	8.00	AP-42 Sec. 11.1 (3/04)
SO_X as SO_2	0.0003	0.1	0.07	Mass balance
Filterable $PM/PM_{10}/PM_{2.5}$	0.0115	4.6	2.87	Based on permit limit of 0.01 gr/dscf @ 15% O_2
Condensible PM	0.019	7.8	4.85	AP-42 Sec. 11.1 (3/04)
Total PM	0.031	12.4	7.72	Sum of filterable and condensible above
PM_{10}	0.031	12.4	7.72	Sum of filterable and condensible above
$PM_{2.5}$	0.031	12.4	7.72	Sum of filterable and condensible above
Benzene	0.00039	0.2	0.10	AP-42 Sec. 11.1 (3/04)
Formaldehyde	0.0015	0.6	0.38	2-11-99 source test by Pac Rock in Portland

Greenhouse Gases	kg/MMBtu	GWP	CO_2e lb/MMBtu	CO_2e lb/gallon	CO_2e tpy	
CO_2	73.96	1	163.05	23	15,286	40 CFR 98
CH_4	0.0090	25	0.493	0.068	46	AP-42 Table 11.1-6 (3/04)
N_2O	0.0006	298	0.394	0.054	37	40 CFR 98
Total GHG - CO_2e	73.97		163.941	23	15,370	

[1] This emission factor is based on the permit limit of 0.01 gr/dscf @ 15% O_2 and the maximum air flow through the baghouse (~32,940 dscfm at 11.3% O_2 - note that PM concentration must be corrected for the O_2 concentration at the measured flow to calculate maximum potential emissions).
[2] All PM is expected to have an aerodynamic diameter of 2.5 μm or less.

6.b Asphalt Oil Storage (*existing*). Asphalt oil tanks at the facility are vented to the Blue Smoke baghouse system. SWCAA believes that the proposed Blue Smoke Baghouse will provide control of asphalt fumes equivalent to the previously installed Smog-Hog electrostatic precipitator or a fiber bed filter (~99.5%). Controlled emissions from asphalt oil storage are expected to be negligible.

6.c HMA Handling and Storage (*modified*). Emissions from HMA storage and handling consist of particulate matter, volatile organic compounds, and carbon monoxide. Potential emissions are calculated based on 500,000 ton per year asphalt production, a maximum asphalt production temperature of 325 °F, a default asphalt volatility of –0.5% loss by weight, and emission factors from AP-42 Section 11.1, Table 11.1-14. Emissions from truck loadout are captured and vented to a Blue Smoke Baghouse. The combined particulate matter collection and control efficiency

of the Blue Smoke Baghouse is estimated at 50%. Emissions from asphalt handling and silo filling are captured and vented to the flame zone of the aggregate dryer. The control efficiency of the dryer flame zone is estimated at 99% for all pollutants. Consistent with SWCAA permitting policy, emission factors for toxic air pollutants with a factor rating of 'C' or less were not considered in this review.

Annual emissions will be calculated based on actual asphalt throughput using the methodology below.

HMA Handling and Storage

Total Asphalt Production =	500,000	tons
Asphalt Production Rate =	400	tons per hour
Asphalt Volatility =	-0.5	Expressed as % loss on heating
Asphalt Temperature =	325	deg F
Loadout Capture Eff. =	50%	(based on capture % and use of Blue Smoke Baghouse)
Silo Filling Capture Eff. =	99%	(based on capture % and vent to dryer flame zone)

Loadout Emissions	Uncontrolled	Controlled	Emissions	
Pollutant	lb/ton HMA	lb/ton HMA	lb/hr	tpy
CO	1.35E-03	1.35E-03	5.40E-01	0.34
VOCs as propane	4.16E-03	4.16E-03	1.66E+00	1.04
Fugitive $PM/PM_{10}/PM_{2.5}$	5.22E-04	2.61E-04	1.04E-01	0.07

Silo Filling Emissions	Uncontrolled	Controlled	Emissions	
Pollutant	lb/ton HMA	lb/ton HMA	lb/hr	tpy
CO	1.18E-03	1.18E-05	4.72E-03	0.003
VOCs as propane	1.22E-02	1.22E-04	4.87E-02	0.03
Fugitive $PM/PM_{10}/PM_{2.5}$	5.86E-04	5.86E-06	2.34E-03	0.001

[1] All PM is expected to have an aerodynamic diameter of 2.5 μm or less.

ADP Application CL-3204. The modifications proposed by Lakeside will increase uncontrolled emission factors due to the increase in maximum asphalt production temperature (315 °F to 325 °F) and increase the control efficiency for silo filling operations (50% to 99%).

6.d Blue Smoke Baghouse System (*existing*). Potential emissions from the Blue Smoke baghouse system are calculated based on 2,000 hour per year of operation, a rated exhaust rate of 25,000 dscfm, and a maximum emission concentration of 0.005 gr/dscf.

Annual emissions will be calculated based on actual baghouse operation using the methodology below.

Blue Smoke Baghouse

Annual Operation = 2,000 hours per year

	Emissions			
Pollutant	gr/dscf	dscfm	lb/hr	tpy
Fugitive $PM/PM_{10}/PM_{2.5}$	0.005	25,000	1.07	1.07

6.e Hot Oil Heater (*existing*). Potential annual emissions from oil heater operation are calculated based on 8,760 hours per year of operation and a rated heat input of 1.412 MMBtu/hr. For fuel oil firing, a mass balance was used to calculate sulfur oxides emissions using the rated maximum fuel consumption for the heater (~10.1 gallons per hour if fuel heat content is 140,000 Btu per gallon), a fuel sulfur content of 0.0015% by weight, and the assumption that all fuel sulfur is converted to sulfur oxides.

Annual emissions will be calculated based on actual fuel consumption and the emission factors listed below unless new emission factors are provided by the manufacturer or developed through source testing.

Hot Oil Heater - Natural Gas Fired

Heat Rate =	1.412	MMBtu/hr
Natural Gas Heat Content =	1,020	Btu/scf
Natural Gas Consumption =	1,384	scfh
Hours per year =	8,760	hours
Natural Gas Consumption =	12,126,588	scf/yr based on 1,020 Btu/scf

Pollutant	lb/MMscf	lb/hr	tpy	Emission Factor Source
NO_X	100	1.38E-01	0.61	AP-42 Sec. 1.4 (7/98)
CO	84	1.16E-01	0.51	AP-42 Sec. 1.4 (7/98)
VOC	5.5	7.61E-03	0.033	AP-42 Sec. 1.4 (7/98)
SO_X as SO_2	0.6	8.31E-04	0.0036	Material Balance
PM total	7.6	1.05E-02	0.046	AP-42 Sec. 1.4 (7/98)
PM_{10}	7.6	1.05E-02	0.046	AP-42 Sec. 1.4 (7/98)
$PM_{2.5}$	7.6	1.05E-02	0.046	AP-42 Sec. 1.4 (7/98)
Benzene	0.0021	2.91E-06	1.27E-05	AP-42 Sec. 1.4 (7/98)
Formaldehyde	0.075	1.04E-04	4.55E-04	AP-42 Sec. 1.4 (7/98)

Greenhouse Gases	kg/MMBtu	GWP	CO_2e lb/MMBtu	CO_2e lb/MMscf	tpy, CO_2e
CO_2	53.02	1	116.89	120,162	723
CH_4	0.001	25	0.055	57	0.3
N_2O	0.0001	298	0.066	68	0.4
Total GHG - CO_2e	53.0211		117.010	120,286	724

Hot Oil Heater - Fuel Oil Fired

Heat Rate =	1.412	MMBtu/hr
Fuel Oil Heat Value =	138,000	Btu/gallon (for use with GHG factors from 40 CFR 98)
Fuel Oil Sulfur Content =	0.0015%	by weight
Fuel Oil Consumption =	10.2	gallons per hour
Hours Per Year =	8,760	
Fuel Oil Consumption =	89,631	gallons per year

Pollutant	lb/M gal	lb/hr	tpy	EF Source
NO_X	20	2.05E-01	0.90	AP-42 Sec. 1.3 (9/98)
CO	5	5.12E-02	0.22	AP-42 Sec. 1.3 (9/98)
VOC	0.2	2.05E-03	0.01	AP-42 Sec. 1.3 (9/98)
SO_X as SO_2	0.216	2.21E-03	0.01	Material Balance
PM total	3.3	3.38E-02	0.15	AP-42 Sec. 1.3 (9/98)
PM_{10}[1]	2.3	2.35E-02	0.10	AP-42 Sec. 1.3 (9/98)
$PM_{2.5}$[2]	1.55	1.59E-02	0.07	AP-42 Sec. 1.3 (9/98)

Greenhouse Gases	kg/MMBtu	GWP	CO_2e lb/MMBtu	CO_2e lb/gallon	CO_2e tpy
CO_2	73.96	1	163.05	23	1,008
CH_4	0.0030	21	0.139	0.019	0.9
N_2O	0.0006	310	0.410	0.057	2.5
Total GHG - CO_2e	73.96		163.603	23	1,012

[1] 1.00 lb/Mgal filterable PM from table 1.3-6, 1.3 lb/Mgal condensable PM from table 1.3-2.
[2] 0.25 lb/Mgal filterable PM from table 1.3-6, 1.3 lb/Mgal condensable PM from table 1.3-2.

6.f Fugitive Dust Emissions (*existing*).

Aggregate Handling and Storage. Potential emissions of fugitive dust from aggregate handling and storage are calculated based on Equation 1 from AP-42 Section 13.2.4 (11/06), an 80% control efficiency (wet suppression and natural precipitation), an aggregate throughput of 500,000 tons per year, and five handling points.

Annual emissions will be calculated based on actual aggregate throughput and the emission factors identified below unless new emission factors are developed through source testing.

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

Where: E = emission factor (lb PM per ton aggregate handled)
k = particle size multiplier (dimensionless). k=1.0 for PM, 0.35 for PM_{10}, 0.053 for $PM_{2.5}$
U = mean wind speed (miles per hour) – conservatively assumed to be 15 mph for this facility
M = aggregate moisture content (%) – conservatively estimated to be 2% for this facility

Maximum aggregate handling and storage emissions are presented in the table below.

Aggregate Handling and Storage

Total Amount of Aggreagate Handled =	500,000
# of Times Handled =	5
Average Moisture Content =	2.0%
Wind Speed (mph)=	15
Wet Suppression Factor =	80%

Pollutant	Uncontrolled Emission Factor lb/ton	Controlled Emission Factor lb/ton	Emissions tons	Emission Factor Source
PM total	0.0133	0.00267	3.34	AP-42 Section 13.2.4 (11/06), Eq. 1
PM_{10}	0.0047	0.00093	1.17	AP-42 Section 13.2.4 (11/06), Eq. 1
$PM_{2.5}$	0.0007	0.00014	0.18	AP-42 Section 13.2.4 (11/06), Eq. 1

Haul Roads. Potential emissions from unpaved haul roads were calculated using default emission calculations from EPA AP-42, Section 13.2.2 (11/06), an average truck weight of 28 tons, an average road silt content of 4.8%, and an average of 0.5 miles of driving per load of HMA (sum of aggregate delivery driving and HMA pickup – note that most of the plant site is paved). The use of wet suppression in addition to natural precipitation is expected to provide an overall control efficiency of 80% for haul road emissions. Total mileage is estimated from an average HMA/aggregate load weight of 25 tons.

Annual emissions will be calculated based on actual road usage and the emission factors identified below unless new emission factors are developed through source testing. Because HMA is primarily aggregate by weight, and the amount of aggregate handled at the site will be approximately equal to the amount of HMA produced in any one year, the lb/ton emission factors presented below can be conservatively assumed to represent lb/ton HMA produced.

$$E = k\left(\frac{s}{12}\right)^{a}\left(\frac{w}{3}\right)^{b}$$

Where: w = average truck weight in tons;
s = road surface silt content (%); and
The constants k, a, and b are given in the table below:

Constant	$PM_{2.5}$	PM_{10}	PM_{30} (assumed to represent PM)
k (lb/vehicle mile traveled)	0.15	1.5	4.9
a	0.9	0.9	0.7
b	0.45	0.45	0.45

Maximum annual haul road emissions are presented in the table below.

Haul Road Emissions - Unpaved

HMA Production =	500,000	tons
Average Truck Weight =	28	tons
Average Amt of HMA per Truck =	25	tons
Average Trip Distance =	0.50	miles
Total # of Trips =	20,000	loads
Total Miles Traveled =	10,000	miles
Assumed Silt Content =	4.8	%
Assumed Control (wet supp.) =	80%	

	Emission Factor				
	Uncontrolled	Controlled	lb/ton	Emissions	
Pollutant	lb/mile	lb/mile	HMA	tons	Emission Factor Souce
PM	7.05	1.41	0.0282	7.05	AP-42 Sec. 13.2.2 (12/03), Eq. 1(a)
PM_{10}	1.80	0.36	0.00719	1.80	AP-42 Sec. 13.2.2 (12/03), Eq. 1(a)
$PM_{2.5}$	0.18	0.036	0.000719	0.18	AP-42 Sec. 13.2.2 (12/03), Eq. 1(a)

6.g Emissions Summary/Facility-wide Potential to Emit. Facility-wide potential to emit as calculated in the sections above is summarized below.

Pollutant	Potential Emissions (tpy)	Project Increase (tpy)
NO_X	16.40	0.0
CO	26.26	-0.15
VOC	9.10	-2.11
SO_2	0.08	0.0
Lead	0.0	0.0
PM	19.39	-0.06
PM_{10}	11.93	-0.05
$PM_{2.5}$	9.29	-0.05
TAP	0.47	0.0
HAP	0.47	0.0
CO_2e	16,381	0

Pollutant	CAS Number	Category	Facility-wide Emissions (lb/yr)	Project Increase (lb/yr)	WAC 173-460 SQER (lb/yr)
Benzene	71-43-2	HAP/TAP A	195.0	0.0	20
Formaldehyde	50-00-0	HAP/TAP A	750.9	0.0	20

7. REGULATIONS AND EMISSION STANDARDS

Regulations that have been used to evaluate the acceptability of the proposed facility and establish emission limits and control requirements include, but are not limited to, the regulations, codes, or requirements listed below.

7.a Title 40 Code of Federal Regulations (40 CFR) 60.7 "Notification and Record Keeping" requires that notification shall be submitted to SWCAA, the delegated authority, for date construction commenced, anticipated initial startup, and initial startup.

7.b 40 CFR Part 60.8 "Performance Tests" requires that emission tests be conducted according to test methods approved in advance by the permitting authority and a copy of the results be submitted to the permitting authority. Initial testing of this facility was conducted on July 27, 2000.

7.c 40 CFR 60 Subpart I "Standards of Performance for Hot Mix Asphalt (HMA) Facilities" establishes opacity and particulate matter emission limits for all HMA plants that were constructed or modified after June 11, 1973. This Subpart is applicable to the permittee's asphalt plant because the unit was constructed in 2000. The opacity and particulate matter emission limits established pursuant to local New Source Review are more stringent than the standards contained in this regulation.

7.d Revised Code of Washington (RCW) 70A.15.2040 empowers any activated air pollution control authority to prepare and develop a comprehensive plan or plans for the prevention, abatement and control of air pollution within its jurisdiction. An air pollution control authority may issue such orders as may be necessary to effectuate the purposes of the Washington Clean Air Act and enforce the same by all appropriate administrative and judicial proceedings subject to the rights of appeal as provided in Chapter 62, Laws of 1970 ex. sess.

7.e RCW 70A.15.2210 provides for the inclusion of conditions of operation as are reasonably necessary to assure the maintenance of compliance with the applicable ordinances, resolutions, rules and regulations when issuing an Air Discharge Permit for installation and establishment of an air contaminant source.

7.f Washington Administrative Code (WAC) 173-460 "Controls for New Sources of Toxic Air Pollutants" requires Best Available Control Technology for toxic air pollutants (T-BACT), identification and quantification of emissions of toxic air pollutants and demonstration of protection of human health and safety.

7.g WAC 173-476 "Ambient Air Quality Standards" establishes ambient air quality standards for PM_{10}, $PM_{2.5}$, lead, sulfur dioxide, nitrogen dioxide, ozone, and carbon monoxide in the ambient air, which shall not be exceeded.

7.h SWCAA 400-040 "General Standards for Maximum Emissions" requires all new and existing sources and emission units to meet certain performance standards with respect to Reasonably Available Control Technology (RACT), visible emissions, fallout, fugitive emissions, odors, emissions detrimental to persons or property, sulfur dioxide, concealment and masking, and fugitive dust.

7.i SWCAA 400-050 "Emission Standards for Combustion and Incineration Units" requires that all provisions of SWCAA 400-040 be met and that no person shall cause or permit the emission of particulate matter from any combustion or incineration unit in excess of 0.23 grams per dry cubic meter (0.1 grains per dry standard cubic foot) of exhaust gas at standard conditions.

7.j SWCAA 400-060 "Emission Standards for General Process Units" prohibits particulate matter emissions from all new and existing process units in excess of 0.1 grains per dry standard cubic foot of exhaust gas.

7.k SWCAA 400-109 "Air Discharge Permit Applications" requires that an Air Discharge Permit application be submitted for all new installations, modifications, changes, or alterations to process and emission control equipment consistent with the definition of "new source". Sources wishing to modify existing permit terms may submit an Air Discharge Permit application to request such changes. An Air Discharge Permit must be issued, or written

confirmation of exempt status must be received, before beginning any actual construction, or implementing any other modification, change, or alteration of existing equipment, processes, or permits.

7.l SWCAA 400-110 "New Source Review" requires that SWCAA issue an Air Discharge Permit in response to an Air Discharge Permit application prior to establishment of the new source, emission unit, or modification.

7.m SWCAA 400-111 "Requirements for Sources in a Maintenance Plan Area" requires that no approval to construct or alter an air contaminant source shall be granted unless it is evidenced that:

(1) The equipment or technology is designed and will be installed to operate without causing a violation of the applicable emission standards;
(2) Emissions will be minimized to the extent that the new source will not exceed emission levels or other requirements provided in the maintenance plan;
(3) Best Available Control Technology will be employed for all air contaminants to be emitted by the proposed equipment;
(4) The proposed equipment will not cause any ambient air quality standard to be exceeded; and
(5) If the proposed equipment or facility will emit any toxic air pollutant regulated under WAC 173-460, the proposed equipment and control measures will meet all the requirements of that Chapter.

7.n SWCAA 400-114 "Requirements for Replacement or Substantial Alteration of Emission Control Technology at an Existing Stationary Source" requires that no approval to replace or substantially alter emission control technology at an existing source shall be granted unless it is evidenced that Reasonably Available Control Technology (RACT) will be employed for all air contaminants to be emitted by the proposed equipment.

8. RACT/BACT/BART/LAER/PSD/CAM DETERMINATIONS

The proposed equipment and control systems incorporate Best Available Control Technology (BACT) for the types and amounts of air contaminants emitted by the processes as described below:

New BACT Determinations

8.a BACT Determination – Asphalt Plant. The proposed use of natural gas or low sulfur #2 fuel oil, process enclosure, limited material temperature (≤ 325 °F), and fabric filtration has been determined to meet the requirements of BACT for asphalt production at this facility.

8.b BACT Determination – Asphalt Handling and Storage. The proposed use of process enclosure and thermal destruction has been determined to meet the requirements of BACT for asphalt handling and storage at this facility.

Previous BACT Determinations

8.c BACT/RACT Determination – Asphalt Handling and Truck Loadout (*SWCAA 11-2994*). The use of a "Blue Smoke Baghouse" with a sorbent material for the control of asphalt fume is expected to provide the top level of control for captured asphalt fume. The addition of lateral shrouding to the truck loadout to improve asphalt fume capture is expected to be necessary to meet the requirements of RACT.

8.d BACT Determination – Asphalt Plant – Particulate Matter Emissions (*SWCAA 06-2690*). The use of a baghouse to limit filterable particulate matter emissions to 0.010 gr/dscf @ 15% O_2 meets the requirements of BACT for this facility. The original BACT determination for this facility identified 0.010 gr/dscf as meeting the requirements of BACT, however the oxygen correction (7%) was only established in the permit limitation. Based on a review of emission test results from this and other asphalt plants within SWCAA's jurisdiction, SWCAA has determined that that this limitation should be more appropriately corrected to 15% O_2.

8.e BACT Determination – Asphalt Plant – Particulate Matter Emissions (*SWCAA 00-2258R1*, *SWCAA 00-2258*). The use of a baghouse that limits exhaust particulate matter concentration to 0.010 gr/dscf or less (as determined by Method 5 front-half), and visible emissions that are five percent opacity or less achieves Best Available Control Technology for this HMA plant. Visible emissions of five percent opacity or less from the drum mix dryer and loading and transfer equipment meet BACT for these processes.

8.f BACT Determination – Asphalt Plant (*SWCAA 00-2258R1*). Use of natural gas or low sulfur #2 fuel oil and temperature control of hot mix asphalt at the outlet from the drum mixer not to exceed 315°F meets BACT for this facility including T-BACT for control of toxic air pollutant emissions.

8.g BACT Determination – Asphalt Plant (*SWCAA 00-2258*). Use of natural gas and temperature control of hot mix asphalt at the outlet from the drum mixer not to exceed 315°F meets BACT for this facility including T-BACT for control of toxic air pollutant emissions.

8.h BACT Determination – Truck Loadout (*SWCAA 00-2258R1*, *SWCAA 00-2258*). Use of a Smog Hog on truck loadout emissions and on the liquid asphalt storage tanks achieves BACT for odors.

Other Determinations

8.i Prevention of Significant Deterioration (PSD) Applicability Determination: The potential to emit of this facility is less than applicable PSD applicability thresholds. Likewise, this permitting action will not result in a potential increase in emissions equal to or greater than the PSD thresholds. Therefore, PSD review is not applicable to this action.

8.j Compliance Assurance Monitoring (CAM) Applicability Determination. CAM is not applicable to any emission unit at this facility because it is not a major source and is not required to obtain a Part 70 permit.

9. AMBIENT IMPACT ANALYSIS

9.a TAP Small Quantity Review. The modification proposed in ADP Application CL-3204 will not affect the type or quantity of TAP emissions from asphalt plant operations.

Conclusions

9.b Modification of asphalt plant operations, as proposed in ADP Application CL-3204, will not cause the ambient air quality requirements of Title 40 Code of Federal Regulations (CFR) Part 50 "National Primary and Secondary Ambient Air Quality Standards" to be violated.

9.c Modification of asphalt plant operations, as proposed in ADP Application CL-3204, will not cause the requirements of WAC 173-460 "Controls for New Sources of Toxic Air Pollutants" or WAC 173-476 "Ambient Air Quality Standards" to be violated.

9.d Modification of asphalt plant operations, as proposed in ADP Application CL-3204, will not cause a violation of emission standards for sources as established under SWCAA General Regulations Sections 400-040 "General Standards for Maximum Emissions," 400-050 "Emission Standards for Combustion and Incineration Units," and 400-060 "Emission Standards for General Process Units."

10. DISCUSSION OF APPROVAL CONDITIONS

SWCAA has made a determination to issue ADP 22-3538 in response to ADP Application CL-3204. ADP 22-3538 contains approval requirements deemed necessary to assure compliance with applicable regulations and emission standards as discussed below.

10.a Supersession of Previous Permits. ADP 22-3538 supersedes ADP 11-2994 in its entirety.

10.b General Basis. Permit requirements for equipment affected by this permitting action incorporate the operating schemes proposed by the applicant in ADP Application CL-3204. Permit requirements established by this action are intended to implement BACT, minimize emissions, and assure compliance with applicable requirements on a continuous basis. Emission limits for approved equipment are based on the maximum potential emissions calculated in Section 6 of this Technical Support Document.

10.c Monitoring and Recordkeeping Requirements. ADP 22-3538 establishes monitoring and recordkeeping requirements sufficient to document compliance with applicable emission limits, ensure proper operation of approved equipment and provide for compliance with generally applicable requirements. Monitoring and recordkeeping requirements for emission units not affected by modifications proposed in ADP Application CL-3204 have been carried forward unchanged from ADP 11-2994.

10.d Reporting Requirements. ADP 22-3538 establishes general reporting requirements for annual air emissions, upset conditions and excess emissions. Specific reporting requirements are established for fuel consumption, asphalt production, and haul road mileage. Reports are to be submitted on an annual basis. Reporting requirements for emission units not affected by modifications proposed in ADP Application CL-3204 have been carried forward unchanged from ADP 11-2994.

10.e Emission Limits. Emission limits established in ADP 11-2994 have been revised to reflect the modifications proposed in ADP Application CL-3204. Emission limits for emission units not affected by modifications proposed in ADP Application CL-3204 have been carried forward unchanged from ADP 11-2994.

10.f Operating Limits and Requirements. Operating limits and requirements established in ADP 11-2994 have been revised to reflect the modifications proposed in CL-3204. ADP 22-3538 increases the maximum allowable asphalt production temperature to 325 °F and requires asphalt handling emissions to be vented to the flame zone of the aggregate dryer. Operating limits and requirements for emission units not affected by modifications proposed in ADP Application CL-3204 have been carried forward unchanged from ADP 11-2994.

11. START-UP AND SHUTDOWN/ALTERNATIVE OPERATING SCENARIOS/POLLUTION PREVENTION

11.a Start-up and Shutdown Provisions. Pursuant to SWCAA 400-081 "Start-up and Shutdown", technology based emission standards and control technology determinations shall take into consideration the physical and operational ability of a source to comply with the applicable standards during start-up or shutdown. Where it is determined that a source is not capable of achieving continuous compliance with an emission standard during start-up or shutdown, SWCAA shall include appropriate emission limitations, operating parameters, or other criteria to regulate performance of the source during start-up or shutdown.

The applicant did not identify any start-up and shutdown periods during which affected equipment is not capable of achieving continuous compliance with applicable technology determinations or approval conditions. To SWCAA's knowledge, this facility can comply with all applicable standards during startup and shutdown.

11.b Alternate Operating Scenarios. SWCAA conducted a review of alternate operating scenarios applicable to equipment affected by this permitting action. The permittee did not propose or identify any applicable alternate operating scenarios. Therefore, none were included in the permit requirements.

11.c Pollution Prevention Measures. SWCAA conducted a review of possible pollution prevention measures for the facility. No pollution prevention measures were identified by either the permittee or SWCAA separate or in addition to those measures required under BACT considerations. Therefore, none were included in the permit requirements.

12. EMISSION MONITORING AND TESTING

12.a Emission Testing – Hot Mix Asphalt Plant. Emission testing of the Hot Mix Asphalt Plant is required on a continuing 5-year cycle. All emission testing shall be conducted in accordance with ADP 22-3538, Appendix A.

12.b Emission Monitoring – Hot Mix Asphalt Plant. Emission monitoring of the Hot Mix Asphalt Plant is required on a continuing 12-month cycle. All emission monitoring shall be conducted in accordance with ADP 22-3538, Appendix C.

12.c Emission Testing – Blue Smoke Baghouse. Emission testing of the Blue Smoke Baghouse is required on a continuing 10-year cycle. All emission testing shall be conducted in accordance with ADP 22-3538, Appendix B.

13. FACILITY HISTORY

13.a Previous Permitting Actions. SWCAA has previously issued the following Permits for this facility:

Date	Application Number	Permit Number	Purpose
10/14/2011	CL-1951	11-2994	Replacement of SmogHog ESP with Dustex 3430 baghouse (25,000 acfm).
8/24/2006	CL-1745	06-2690	Revision of O_2 correction factor for PM emission limit from 7% to 15%. Superseded by ADP 11-2994.
1/15/2001	CL-1495	00-2258R1	Revision of permit requirements to route asphalt oil storage tank vents to an ESP. Approval to fire aggregate dryer on #2 diesel. Superseded by ADP 06-2690.
4/6/2000	CL-1388	00-2258	Installation of new Astec portable drum mix asphalt plant with baghouse. Installation of new asphalt oil storage tanks equipped with CECO filters. Superseded by ADP 00-2258R1.

13.b Compliance History. A search of source records on file at SWCAA identified the following compliance issues during the past five (5) years:

Date	NOV Number	Violation
3/29/2022	10627	Improper operation of control equipment, excess fugitive emissions from silo tops, modification of emission control equipment without approval, and excessive asphalt production temperature in violation of ADP 11-2994.

14. PUBLIC INVOLVEMENT OPPORTUNITY

14.a Public Notice for ADP Application CL-3204. Public notice for ADP Application CL-3204 was published on the SWCAA internet website for a minimum of (15) days beginning on July 20, 2022.

14.b Public/Applicant Comment for ADP Application CL-3204. SWCAA did not receive specific comments, a comment period request or any other inquiry from the public regarding this ADP application. Therefore no public comment period was provided for this permitting action.

14.c State Environmental Policy Act. The proposed project is limited to minor changes in operating practice and modification of emission control equipment at an existing hot mix asphalt plant. This project is exempt from SEPA requirements pursuant to WAC 197-11-800(3) since it only involves repair, remodeling, maintenance, or minor alteration of existing structures, equipment or facilities, and does not involve material expansions or changes in use. SWCAA issued a Determination of SEPA Exempt (SWCAA 22-026) concurrent with issuance of ADP 22-3538.