

Seekonk Asphalt
Potential To Emit Analysis

Facility-wide Emissions Summary

	Pollutant	HMA Drum Dryer (TPY)	Hot Oil Heater (TPY)	HMA Silo Filling (TPY)	HMA Loadout (TPY)	Storage Tanks (TPY)	Haul Road Emissions (TPY)	Conveyors (TPY)	Storage Piles (TPY)	Total (TPY)
Criteria Pollutants (TPY)	PM ₁₀	1.45	0.09	5.05E-02	2.07E-03	-	0.34	0.31	0.03	2.26
	PM _{2.5}	1.45	0.09	5.05E-02	2.07E-03	-	0.08	0.05	0.004	1.72
	CO	10.25	0.51	0.04	0.05	6.25E-03	-	-	-	10.9
	NO _x	1.125	0.89	-	-	-	-	-	-	2.0
	SO ₂	0.425	0.03	-	-	-	-	-	-	0.5
	VOC	3.75	0.51	2.17E-02	0.14	3.33E-03	-	-	-	4.4
	Lead	7.75E-05	6.74E-05	-	-	-	-	-	-	1.4E-04
	CH ₄	0.925	0.04	-	-	-	-	-	-	1.0
	CO ₂	4125	1009.77	-	-	-	-	-	-	5134.8
	N ₂ O	-	0.01	-	-	-	-	-	-	1.3E-02
CO ₂ e	4148.125	1.01E+03	-	-	-	-	-	-	5161.6	
HAPs (TPY)	2-Methylnaphthalene	1.13E-02	1.45E-07	1.14E-03	1.72E-05	-	-	-	-	1.24E-02
	3-Methylchloranthrene	-	1.09E-08	-	-	-	-	-	-	1.09E-08
	7,12-Dimethylbenz(a)anthracene	-	9.70E-08	-	-	-	-	-	-	9.70E-08
	Acenaphthene	1.25E-02	9.42E-07	1.02E-04	1.88E-06	-	-	-	-	1.26E-02
	Acenaphthylene	9.25E-03	1.13E-08	3.04E-06	2.02E-07	-	-	-	-	9.25E-03
	Anthracene	1.75E-04	1.45E-08	2.82E-05	5.06E-07	-	-	-	-	2.04E-04
	Benz(a)anthracene	1.08E-03	1.79E-07	1.22E-05	1.37E-07	-	-	-	-	1.09E-03
	Benzene	4.88E-02	1.27E-05	6.95E-06	7.71E-05	1.04E-06	-	-	-	4.88E-02
	Benzo(a)pyrene	2.75E-05	7.27E-09	-	1.66E-08	-	-	-	-	2.75E-05
	Benzo(b)fluoranthene	2.63E-05	6.61E-08	-	5.49E-08	-	-	-	-	2.64E-05
	Benzo(g,h,i)perylene	1.25E-05	1.01E-07	-	1.37E-08	-	-	-	-	1.26E-05
	Benzo(k)fluoranthene	1.38E-05	6.61E-08	-	1.59E-08	-	-	-	-	1.38E-05
	Bromomethane	-	-	1.06E-06	1.42E-05	3.23E-06	-	-	-	1.85E-05
	Carbon Disulfide	-	-	3.47E-06	1.93E-05	1.04E-05	-	-	-	3.32E-05
	Chloroethane	-	-	8.69E-07	3.11E-07	1.30E-07	-	-	-	1.31E-06
	Chloromethane	-	-	4.99E-06	2.22E-05	7.81E-07	-	-	-	2.80E-05
	Chrysene	5.00E-06	1.06E-07	4.56E-05	7.45E-07	-	-	-	-	5.14E-05
	Dibenzo(a,h)anthracene	-	7.46E-08	-	2.67E-09	-	-	-	-	7.72E-08
	Dichlorobenzene	-	7.27E-06	-	-	-	-	-	-	7.27E-06
	Ethylbenzene	3.00E-02	2.84E-06	8.25E-06	4.15E-04	1.25E-06	-	-	-	3.04E-02
	Fluoranthene	5.13E-06	2.16E-07	3.26E-05	3.61E-07	-	-	-	-	3.83E-05
	Fluorene	2.25E-05	2.00E-07	2.19E-04	5.57E-06	-	-	-	-	2.48E-04
	Formaldehyde	1.71E-01	1.47E-03	1.50E-04	1.30E-04	7.29E-03	-	-	-	1.80E-01
	Hexane	1.15E-01	1.09E-02	2.17E-05	2.22E-04	-	-	-	-	1.26E-01
	Indeno(1,2,3-cd)pyrene	7.63E-05	9.55E-08	-	3.40E-09	-	-	-	-	7.63E-05
	Isooctane (2,2,4-Trimethylpentane)	-	-	6.73E-08	2.67E-06	-	-	-	-	2.73E-06
	Methylene Chloride	-	-	5.86E-08	0.00E+00	1.77E-07	-	-	-	2.36E-07
Naphthalene	4.75E-04	5.05E-05	3.95E-04	9.04E-06	-	-	-	-	9.30E-04	
PAH	-	-	-	-	1.25E-04	-	-	-	1.25E-04	
Phenanthrene	1.13E-02	4.69E-07	3.91E-04	5.86E-06	-	-	-	-	1.16E-02	

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	Pollutant	HMA Drum Dryer (TPY)	Hot Oil Heater (TPY)	HMA Silo Filling (TPY)	HMA Loadout (TPY)	Storage Tanks (TPY)	Haul Road Emissions (TPY)	Conveyors (TPY)	Storage Piles (TPY)	Total (TPY)
	Pyrene	1.10E-06	1.90E-07	9.55E-05	1.08E-06	-	-	-	-	9.79E-05
	Styrene	-	-	1.17E-06	1.08E-05	3.65E-06	-	-	-	1.56E-05
	Toluene	9.50E-04	2.77E-04	1.35E-05	3.11E-04	4.17E-05	-	-	-	1.59E-03
	1,1,1-Trichloroethane	-	1.05E-05	-	0.00E+00	-	-	-	-	1.05E-05
	OCDD	-	1.38E-10	-	-	-	-	-	-	1.38E-10
	Xylene	2.50E-02	4.87E-06	5.58E-05	7.26E-04	8.13E-06	-	-	-	2.58E-02
	Arsenic	7.00E-05	1.21E-06	-	-	-	-	-	-	7.12E-05
	Beryllium	0.00E+00	7.27E-08	-	-	-	-	-	-	7.27E-08
	Cadmium	5.13E-05	6.67E-06	-	-	-	-	-	-	5.79E-05
	Chromium	6.31E-04	8.49E-06	-	-	-	-	-	-	6.40E-04
	Cobalt	3.25E-06	5.09E-07	-	-	-	-	-	-	3.76E-06
	Manganese	9.63E-04	2.30E-06	-	-	-	-	-	-	9.65E-04
	Mercury	3.00E-05	1.58E-06	-	-	-	-	-	-	3.16E-05
	Nickel	7.88E-03	1.27E-05	-	-	-	-	-	-	7.89E-03
	Selenium	4.38E-05	1.45E-07	-	-	-	-	-	-	4.39E-05
	Antimony	2.25E-05	-	-	-	-	-	-	-	2.25E-05
	Cumene	-	-	-	1.63E-04	-	-	-	-	1.63E-04
	Hexavalent chromium	5.63E-05	-	-	-	-	-	-	-	5.63E-05
	Lead	7.75E-05	6.74E-05	-	-	-	-	-	-	1.45E-04
	Methyl Chloroform	6.00E-03	-	-	-	-	-	-	-	6.00E-03
	MTBE	-	-	-	0.00E+00	-	-	-	-	0.00E+00
	Phenol	-	-	-	1.30E-05	0.00E+00	-	-	-	1.30E-05
	Phosphorus	3.50E-03	-	-	-	-	-	-	-	3.50E-03
	Trimethylpentane, 2,2,4-	6.75E-05	-	-	-	-	-	-	-	6.75E-05
Other (TPY)	Barium	7.25E-04	-	-	-	-	-	-	-	7.25E-04
	Copper	3.88E-04	-	-	-	-	-	-	-	3.88E-04
	Zinc	7.63E-03	-	-	-	-	-	-	-	7.63E-03
	Tetrachloroethene	-	-	-	1.14E-05	-	-	-	-	1.14E-05
	Trichloroethene	-	-	-	0.00E+00	-	-	-	-	0.00E+00
	Trichlorofluoromethane	-	-	-	1.93E-06	-	-	-	-	1.93E-06
	2-Butanone	-	-	-	-	1.30E-06	-	-	-	1.30E-06

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HMA Drum Dryer
Seekonk Asphalt

Parameter	Value	Units	Source
Type of Dryer	Rotary Drum Dryer		ADM Quote
Model	EX7636 Dryer		ADM Quote
Fuel Type	Natural Gas		ADM Quote
Heat Input Rate	75	MMBTU/hr	ADM Quote
Exhaust Flow Rate	47,000	ACFM	From ADM
Exhaust Flow Rate	30,382	DSCFM	Assumes 10% moisture
Max hourly production rate	225	tons/hr	ADM Quote
Max yearly production	250,000	tons/year	Proposed Limit
Annual Natural Gas	81,699,000	scf per year	
Hours per month	288	hours	Estimated
Hours per year	1,111	hours	Estimated

Emission Calculations

Pollutant	Emission Factor	Units	Potential Emissions (lb/hr)	Potential Emissions (TPM)	Potential Emissions (TPY)	Emission Factor Source
Criteria						
PM ₁₀	0.01	gr/dscf	2.60	0.37	1.45	MassDEP BACT Limit based on gr/dscf
PM _{2.5}	0.01	gr/dscf	2.60	0.37	1.45	MassDEP BACT Limit based on gr/dscf
SO ₂	0.0034	lb/ton	0.765	0.11	0.43	AP 42 Section 11.1, Table 11.1-7.
NO _x	0.009	lb/ton	2.025	0.29	1.13	From Vendor ¹
VOC	0.03	lb/ton	6.75	0.97	3.75	From Vendor ¹
CO	0.082	lb/ton	18.45	2.66	10.25	From Vendor ¹
CH ₄	0.0074	lb/ton	1.665	0.24	0.93	AP 42 Section 11.1, Table 11.1-6.
CO ₂	33	lb/ton	7425	1069.20	4125.00	AP 42 Section 11.1, Table 11.1-7.
CO _{2e}	--	lb/ton	7466.63	1075.19	4148.13	
HAPs						
Benzene	3.90E-04	lb/ton	0.08775	1.26E-02	4.88E-02	AP 42 Section 11.1, Table 11.1-10.
Ethylbenzene	2.40E-04	lb/ton	0.054	7.78E-03	3.00E-02	AP 42 Section 11.1, Table 11.1-10.
Formaldehyde	1.37E-03	lb/ton	0.30825	4.44E-02	1.71E-01	Westford Asphalt Plant ²
Hexane	9.20E-04	lb/ton	0.207	2.98E-02	1.15E-01	AP 42 Section 11.1, Table 11.1-10.
Methyl chloroform	4.80E-05	lb/ton	0.0108	1.56E-03	6.00E-03	AP 42 Section 11.1, Table 11.1-10.
2-Methylnaphthalene	9.00E-05	lb/ton	0.02025	2.92E-03	1.13E-02	AP 42 Section 11.1, Table 11.1-10.
Acenaphthene	1.00E-04	lb/ton	0.0225	3.24E-03	1.25E-02	AP 42 Section 11.1, Table 11.1-10.
Acenaphthylene	7.40E-05	lb/ton	0.01665	2.40E-03	9.25E-03	AP 42 Section 11.1, Table 11.1-10.
Anthracene	1.40E-06	lb/ton	0.000315	4.54E-05	1.75E-04	AP 42 Section 11.1, Table 11.1-10.
Benz(a)anthracene	8.60E-06	lb/ton	0.001935	2.79E-04	1.08E-03	AP 42 Section 11.1, Table 11.1-10.
Benzo(a)pyrene	2.20E-07	lb/ton	0.0000495	7.13E-06	2.75E-05	AP 42 Section 11.1, Table 11.1-10.
Benzo(b)fluoranthene	2.10E-07	lb/ton	0.00004725	6.80E-06	2.63E-05	AP 42 Section 11.1, Table 11.1-10.
Benzo(e)pyrene	9.80E-09	lb/ton	0.00002205	3.18E-07	1.23E-06	AP 42 Section 11.1, Table 11.1-10.
Benzo(g,h,i)perylene	1.00E-07	lb/ton	0.0000225	3.24E-06	1.25E-05	AP 42 Section 11.1, Table 11.1-10.
Benzo(k)fluoranthene	1.10E-07	lb/ton	0.00002475	3.56E-06	1.38E-05	AP 42 Section 11.1, Table 11.1-10.
Chrysene	4.00E-08	lb/ton	0.000009	1.30E-06	5.00E-06	AP 42 Section 11.1, Table 11.1-10.
Fluoranthene	4.10E-08	lb/ton	0.000009225	1.33E-06	5.13E-06	AP 42 Section 11.1, Table 11.1-10.
Fluorene	1.80E-07	lb/ton	0.0000405	5.83E-06	2.25E-05	AP 42 Section 11.1, Table 11.1-10.
Indeno(1,2,3-cd)pyrene	6.10E-07	lb/ton	0.00013725	1.98E-05	7.63E-05	AP 42 Section 11.1, Table 11.1-10.
Naphthalene	3.80E-06	lb/ton	0.000855	1.23E-04	4.75E-04	AP 42 Section 11.1, Table 11.1-10.
Perylene	7.00E-09	lb/ton	0.00001575	2.27E-07	8.75E-07	AP 42 Section 11.1, Table 11.1-10.
Phenanthrene	9.00E-05	lb/ton	0.02025	2.92E-03	1.13E-02	AP 42 Section 11.1, Table 11.1-10.
Pyrene	8.80E-09	lb/ton	0.00000198	2.85E-07	1.10E-06	AP 42 Section 11.1, Table 11.1-10.
Toluene	7.60E-06	lb/ton	0.00171	2.46E-04	9.50E-04	AP 42 Section 11.1, Table 11.1-12.
Trimethylpentane, 2,2,4-	5.40E-07	lb/ton	0.0001215	1.75E-05	6.75E-05	AP 42 Section 11.1, Table 11.1-12.
Xylene	2.00E-04	lb/ton	0.045	6.48E-03	2.50E-02	AP 42 Section 11.1, Table 11.1-12.
Antimony	1.80E-07	lb/ton	0.0000405	5.83E-06	2.25E-05	AP 42 Section 11.1, Table 11.1-12.
Arsenic	5.60E-07	lb/ton	0.000126	1.81E-05	7.00E-05	AP 42 Section 11.1, Table 11.1-12.

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Barium	5.80E-06	lb/ton	0.001305	1.88E-04	7.25E-04	AP 42 Section 11.1, Table 11.1-12.
Beryllium	0.00E+00	lb/ton	0	0.00E+00	0.00E+00	AP 42 Section 11.1, Table 11.1-12.
Cadmium	4.10E-07	lb/ton	0.00009225	1.33E-05	5.13E-05	AP 42 Section 11.1, Table 11.1-12.
Chromium	5.05E-06	lb/ton	0.00113625	1.64E-04	6.31E-04	AP 42 Section 11.1, Table 11.1-12.
Hexavalent chromium	4.50E-07	lb/ton	0.00010125	1.46E-05	5.63E-05	AP 42 Section 11.1, Table 11.1-12.
Cobalt	2.60E-08	lb/ton	0.00000585	8.42E-07	3.25E-06	AP 42 Section 11.1, Table 11.1-12.
Copper	3.10E-06	lb/ton	0.0006975	1.00E-04	3.88E-04	AP 42 Section 11.1, Table 11.1-12.
Lead	6.20E-07	lb/ton	0.0001395	2.01E-05	7.75E-05	AP 42 Section 11.1, Table 11.1-12.
Manganese	7.70E-06	lb/ton	0.0017325	2.49E-04	9.63E-04	AP 42 Section 11.1, Table 11.1-12.
Mercury	2.40E-07	lb/ton	0.000054	7.78E-06	3.00E-05	AP 42 Section 11.1, Table 11.1-12.
Nickel	6.30E-05	lb/ton	0.014175	2.04E-03	7.88E-03	AP 42 Section 11.1, Table 11.1-12.
Phosphorus	2.80E-05	lb/ton	0.0063	9.07E-04	3.50E-03	AP 42 Section 11.1, Table 11.1-12.
Selenium	3.50E-07	lb/ton	0.00007875	1.13E-05	4.38E-05	AP 42 Section 11.1, Table 11.1-12.
Zinc	6.10E-05	lb/ton	0.013725	1.98E-03	7.63E-03	AP 42 Section 11.1, Table 11.1-12.

Pollutant	Global Warming Potential
CH ₄	25
CO ₂	1

Footnotes:

[1] Emission Factor from NovaStar Emissions Sheet.

[2] Formaldehyde emission factor based on Westford Asphalt Plant (Transmittal No. X227251, App No. MBR-09-IND-005) - from stack test results.

Conversions:

lbs/ton = 2000
 grains/lb = 7000
 min/hr = 60

Hot Oil Heater

Seekonk Asphalt

Parameter	Value	Units	Source
Fuel Type	Natural Gas or Fuel Oil		Asphalt Supply
Heat Duty of Heater	1,411,765	MMBtu/hr	ADM, email 7/22/21
Natural Gas Heat Content	1,020	Btu/ft ³	AP 42 Section 1.4.1
Hourly Natural Gas Fuel Usage	1,384	ft ³ /hr	Calculated
Annual Natural Gas Usage	12,124,570	ft ³ /yr	
Fuel Oil Heat Content	138,500	Btu/gal	https://www.eia.gov/energyexplained/units-and-calculators/
Hourly Fuel Oil Usage	0.010	1000 gal/hr	Calculated
Annual Fuel Oil Usage	89,000	gal/yr	

Emission Calculations

Pollutant	Emission Factor - Natural Gas (lb/ft ³) ^{1,3}	Emission Factor - Fuel Oil (lb/1000gal) ^{2,3}	Hourly Emissions - Natural Gas (lb/hr)	Hourly Emissions - Fuel Oil (lb/hr)	Max Hourly Emissions (lb/hr)	Potential Emissions - Natural Gas (TPM)	Potential Emissions - Fuel Oil (TPM)	Potential Emissions - Natural Gas (TPY)	Potential Emissions - Fuel Oil (TPY) ⁴	Worst Case Potential Emissions (TPY)
Criteria										
PM ₁₀	7.60E-06	2	0.01	0.02	0.011	0.004	0.008	4.61E-02	8.93E-02	8.93E-02
PM _{2.5}	7.60E-06	2	0.01	0.02	0.020	0.004	0.008	4.61E-02	8.93E-02	8.93E-02
CO	8.40E-05	0.213	0.116	2.17E-03	0.12	0.043	0.001	5.09E-01	9.51E-03	5.09E-01
NO _x	1.00E-04	20	0.14	0.20	0.20	0.051	0.076	6.06E-01	8.93E-01	8.93E-01
SO ₂	5.50E-06	0.34	0.01	3.47E-03	0.01	0.003	0.001	3.33E-02	1.52E-02	3.33E-02
VOC	8.40E-05	5	0.12	0.05	0.12	0.043	0.019	5.09E-01	2.23E-01	5.09E-01
Lead	5.00E-10	0.001510	0.00	0.0000154	0.0000154	0.0	0.0	3.03E-06	6.74E-05	6.74E-05
CH ₄	2.30E-06	1	0.00	0.01	0.01	0.001	0.003	1.39E-02	4.02E-02	4.02E-02
CO ₂	1.20E-01	22617	166.09	230.54	230.54	61.79	85.76	7.27E+02	1.01E+03	1.01E+03
N ₂ O	2.20E-06	0	0.00	0.00	0.00	0.001	0.001	1.33E-02	8.93E-03	1.33E-02
CO _{2e}	--	--	167.08	231.38	231.38	62.2	86.1	7.32E+02	1.01E+03	1.01E+03
HAPs										
2-Methylnaphthalene	2.40E-11	--	3.32E-08	--	3.32E-08	1.236E-08	--	1.45E-07	--	1.45E-07
3-Methylchloranthrene	1.80E-12	--	2.49E-09	--	2.49E-09	9.268E-10	--	1.09E-08	--	1.09E-08
7,12-Dimethylbenz(a)anthracene	1.60E-11	--	2.21E-08	--	2.21E-08	8.238E-09	--	9.70E-08	--	9.70E-08
Acenaphthene	1.80E-12	2.11E-05	2.49E-09	2.15E-07	2.15E-07	9.268E-10	8.001E-08	1.09E-08	9.42E-07	9.42E-07
Acenaphthylene	1.80E-12	2.53E-07	2.49E-09	2.58E-09	2.58E-09	9.268E-10	9.593E-10	1.09E-08	1.13E-08	1.13E-08
Anthracene	2.40E-12	1.22E-07	3.32E-09	1.24E-09	3.32E-09	1.236E-09	4.626E-10	1.45E-08	5.45E-09	1.45E-08
Benz(a)anthracene	1.80E-12	4.01E-06	2.49E-09	4.09E-08	4.09E-08	9.268E-10	1.521E-08	1.09E-08	1.79E-07	1.79E-07
Benzene	2.10E-09	2.14E-04	2.91E-06	2.18E-06	2.91E-06	1.081E-06	8.115E-07	1.27E-05	9.55E-06	1.27E-05
Benzo(a)pyrene	1.20E-12	--	1.66E-09	--	1.66E-09	6.179E-10	--	7.27E-09	--	7.27E-09
Benzo(b)fluoranthene	1.80E-12	1.48E-06	2.49E-09	1.51E-08	1.51E-08	9.268E-10	5.612E-09	1.09E-08	6.61E-08	6.61E-08
Benzo(g,h,i)perylene	1.20E-12	2.26E-06	1.66E-09	2.30E-08	2.30E-08	6.179E-10	8.570E-09	7.27E-09	1.01E-07	1.01E-07
Benzo(k)fluoranthene	1.80E-12	1.48E-06	2.49E-09	1.51E-08	1.51E-08	9.268E-10	5.612E-09	1.09E-08	6.61E-08	6.61E-08
Chrysene	1.80E-12	2.38E-06	2.49E-09	2.43E-08	2.43E-08	9.268E-10	9.025E-09	1.09E-08	1.06E-07	1.06E-07
Dibenzo(a,h)anthracene	1.20E-12	1.67E-06	1.66E-09	1.70E-08	1.70E-08	6.179E-10	6.332E-09	7.27E-09	7.46E-08	7.46E-08
Dichlorobenzene	1.20E-09	--	1.66E-06	--	1.66E-06	6.179E-07	--	7.27E-06	--	7.27E-06
Ethylbenzene	--	6.36E-05	--	6.48E-07	6.48E-07	--	2.412E-07	--	2.84E-06	2.84E-06
Fluoranthene	3.00E-12	4.84E-06	4.15E-09	4.93E-08	4.93E-08	1.545E-09	1.835E-08	1.82E-08	2.16E-07	2.16E-07
Fluorene	2.80E-12	4.47E-06	3.88E-09	4.56E-08	4.56E-08	1.442E-09	1.695E-08	1.70E-08	2.00E-07	2.00E-07
Formaldehyde	7.50E-08	3.30E-02	1.04E-04	3.36E-04	3.36E-04	3.862E-05	1.251E-04	4.55E-04	1.47E-03	1.47E-03
Hexane	0.0000018	--	2.49E-03	--	2.49E-03	9.268E-04	--	1.09E-02	--	1.09E-02
Indeno(1,2,3-cd)pyrene	1.80E-12	2.14E-06	2.49E-09	2.18E-08	2.18E-08	9.268E-10	8.115E-09	1.09E-08	9.55E-08	9.55E-08
Naphthalene	6.10E-10	1.13E-03	8.44E-07	1.15E-05	1.15E-05	3.141E-07	4.285E-06	3.70E-06	5.05E-05	5.05E-05
Phenanthrene	1.70E-11	1.05E-05	2.35E-08	1.07E-07	1.07E-07	8.753E-09	3.981E-08	1.03E-07	4.69E-07	4.69E-07
Pyrene	5.00E-12	4.25E-06	6.92E-09	4.33E-08	4.33E-08	2.574E-09	1.612E-08	3.03E-08	1.90E-07	1.90E-07
Toluene	3.40E-09	6.20E-03	4.71E-06	6.32E-05	6.32E-05	1.751E-06	2.351E-05	2.06E-05	2.77E-04	2.77E-04
1,1,1-Trichloroethane	--	2.36E-04	--	2.41E-06	2.41E-06	--	8.949E-07	--	1.05E-05	1.05E-05
Xylene	--	1.09E-04	--	1.11E-06	1.11E-06	--	4.133E-07	--	4.87E-06	4.87E-06
OCDD	--	3.10E-09	--	3.16E-11	3.16E-11	--	1.175E-11	--	1.38E-10	1.38E-10
Arsenic	2.00E-10	--	2.77E-07	--	2.77E-07	1.030E-07	--	1.21E-06	--	1.21E-06
Beryllium	1.20E-11	--	1.66E-08	--	1.66E-08	6.179E-09	--	7.27E-08	--	7.27E-08
Cadmium	1.10E-09	--	1.52E-06	--	1.52E-06	5.664E-07	--	6.67E-06	--	6.67E-06
Chromium	1.40E-09	--	1.94E-06	--	1.94E-06	7.208E-07	--	8.49E-06	--	8.49E-06
Cobalt	8.40E-11	--	1.16E-07	--	1.16E-07	4.325E-08	--	5.09E-07	--	5.09E-07
Manganese	3.80E-10	--	5.26E-07	--	5.26E-07	1.957E-07	--	2.30E-06	--	2.30E-06

**Seekonk Asphalt
Potential To Emit Analysis**

Mercury	2.60E-10	--	3.60E-07	--	3.60E-07	1.339E-07	--	1.58E-06	--	1.58E-06
Nickel	2.10E-09	--	2.91E-06	--	2.91E-06	1.081E-06	--	1.27E-05	--	1.27E-05
Selenium	2.40E-11	--	3.32E-08	--	3.32E-08	1.236E-08	--	1.45E-07	--	1.45E-07

Pollutant	Global Warming Potential
CH ₄	25
CO ₂	1
N ₂ O	298

Footnotes:

- [1] Natural Gas Emission Factors from AP-42 Fifth Edition, Tables 1.4-1,-2, 7/98 Update.
- [2] Fuel Oil Emission Factors from AP-42 5th Ed, Tables 1.3-1,-2,-3,-6 5/2010 Update.
- [3] CH₄, CO₂, N₂O, and CO_{2e} Emission Factors from 40 CFR Part 98, Table C-2.
- [4] PTE calculated assuming operation 8760 hours per year.

Conversions:

lbs/ton =	2000
BTU/MMBTU =	1,000,000
hrs/yr =	8760
gal/ft3 =	7.48052
SCF/MMSCF =	1000000
1000 gal/gal =	1000
hrs/month =	744

**Seekonk Asphalt
Potential To Emit Analysis**

**HMA Silo Filling
Seekonk Asphalt**

Parameter	Value	Units	Source
Asphalt Volatility	-0.5	--	Default AP 42 Section 11.1, Table 11.1-14
HMA Mix Temperature	275	°F	Emission Sheet Jeff J.pdf
Emission Factor Organic PM	7.24E-05	lb/ton of HMA	Calculated, AP 42 Section 11.1, Table 11.1-14
Emission Factor TOC	3.47E-03	lb/ton of HMA	Calculated, AP 42 Section 11.1, Table 11.1-14
Emission Factor Total PM	4.04E-04	lb/ton of HMA	Calculated, AP 42 Section 11.1, Table 11.1-14
Emission Factor CO	3.36E-04	lb/ton of HMA	Calculated, AP 42 Section 11.1, Table 11.1-14
Max hourly production rate	225	tons/hr	Proposed limit
Capture Efficiency	100%	--	Engineering Judgement
Control Efficiency	95%	--	Blue Smoke Vendor Quote
Max yearly production	250,000	tons/year	Proposed limit

Emission Calculations

Pollutant	Speciation (lb Compound / lb Organic PM)	Speciation (lb Compound / lb TOC)	Emission Factor (lb/ton HMA)	Max Hourly Emissions (lb/hr)	Potential Emissions (tons) ¹	Emission Factor Source
Criteria						
PM ₁₀	-	-	4.04E-04	9.10E-02	5.05E-02	AP 42 Section 11.1, Table 11.1-14. ^{2,3}
PM _{2.5}	-	-	4.04E-04	9.10E-02	5.05E-02	AP 42 Section 11.1, Table 11.1-14. ^{2,3}
TOC	-	-	1.74E-04	3.91E-02	2.17E-02	AP 42 Section 11.1, Table 11.1-14.
VOC	-	1	1.74E-04	3.91E-02	2.17E-02	AP 42 Section 11.1, Table 11.1-14.
CO	-	-	3.36E-04	7.57E-02	4.20E-02	AP 42 Section 11.1, Table 11.1-14.
HAPs						
Acenaphthene	0.0047	-	8.16E-07	1.84E-04	1.02E-04	AP 42 Section 11.1, Table 11.1-15.
Acenaphthylene	0.00014	-	2.43E-08	5.47E-06	3.04E-06	AP 42 Section 11.1, Table 11.1-15.
Anthracene	0.0013	-	2.26E-07	5.08E-05	2.82E-05	AP 42 Section 11.1, Table 11.1-15.
Benz(a)anthracene	0.00056	-	9.73E-08	2.19E-05	1.22E-05	AP 42 Section 11.1, Table 11.1-15.
Benzo(e)pyrene	0.000095	-	1.65E-08	3.71E-06	2.06E-06	AP 42 Section 11.1, Table 11.1-15.
Chrysene	0.0021	-	3.65E-07	8.21E-05	4.56E-05	AP 42 Section 11.1, Table 11.1-15.
Fluoranthene	0.0015	-	2.61E-07	5.86E-05	3.26E-05	AP 42 Section 11.1, Table 11.1-15.
Fluorene	0.0101	-	1.75E-06	3.95E-04	2.19E-04	AP 42 Section 11.1, Table 11.1-15.
2-Methylnaphthalene	0.0527	-	9.15E-06	2.06E-03	1.14E-03	AP 42 Section 11.1, Table 11.1-15.
Naphthalene	0.0182	-	3.16E-06	7.11E-04	3.95E-04	AP 42 Section 11.1, Table 11.1-15.
Perylene	0.0003	-	5.21E-08	1.17E-05	6.51E-06	AP 42 Section 11.1, Table 11.1-15.
Phenanthrene	0.018	-	3.13E-06	7.04E-04	3.91E-04	AP 42 Section 11.1, Table 11.1-15.
Pyrene	0.0044	-	7.64E-07	1.72E-04	9.55E-05	AP 42 Section 11.1, Table 11.1-15.
Benzene	-	3.20E-04	5.56E-08	1.25E-05	6.95E-06	AP 42 Section 11.1, Table 11.1-16.
Bromomethane	-	4.90E-05	8.51E-09	1.92E-06	1.06E-06	AP 42 Section 11.1, Table 11.1-16.
Carbon Disulfide	-	1.60E-04	2.78E-08	6.25E-06	3.47E-06	AP 42 Section 11.1, Table 11.1-16.
Chloroethane	-	4.00E-05	6.95E-09	1.56E-06	8.69E-07	AP 42 Section 11.1, Table 11.1-16.
Chloromethane	-	2.30E-04	4.00E-08	8.99E-06	4.99E-06	AP 42 Section 11.1, Table 11.1-16.
Cumene	-	-	-	-	-	AP 42 Section 11.1, Table 11.1-16.
Ethylbenzene	-	3.80E-04	6.60E-08	1.49E-05	8.25E-06	AP 42 Section 11.1, Table 11.1-16.
Formaldehyde	-	6.90E-03	1.20E-06	2.70E-04	1.50E-04	AP 42 Section 11.1, Table 11.1-16.
Hexane	-	1.00E-03	1.74E-07	3.91E-05	2.17E-05	AP 42 Section 11.1, Table 11.1-16.
Isooctane (2,2,4-Trimethylpentane)	-	3.10E-06	5.38E-10	1.21E-07	6.73E-08	AP 42 Section 11.1, Table 11.1-16.
Methylene Chloride	-	2.70E-06	4.69E-10	1.06E-07	5.86E-08	AP 42 Section 11.1, Table 11.1-16.
MTBE	-	-	-	-	-	AP 42 Section 11.1, Table 11.1-16.
Styrene	-	5.40E-05	9.38E-09	2.11E-06	1.17E-06	AP 42 Section 11.1, Table 11.1-16.
Tetrachloroethene	-	-	-	-	-	AP 42 Section 11.1, Table 11.1-16.
Toluene	-	6.20E-04	1.08E-07	2.42E-05	1.35E-05	AP 42 Section 11.1, Table 11.1-16.
1,1,1-Trichloroethane	-	-	-	-	-	AP 42 Section 11.1, Table 11.1-16.
Trichloroethene	-	-	-	-	-	AP 42 Section 11.1, Table 11.1-16.
Trichlorofluoromethane	-	-	-	-	-	AP 42 Section 11.1, Table 11.1-16.
Xylene	-	2.57E-03	4.46E-07	1.00E-04	5.58E-05	AP 42 Section 11.1, Table 11.1-16.

Footnotes:

[1] PTE calculated using the max annual production rate.

[2] According to AP 42 Section 11.1, Table 11.1-14 footnote b, the Total PM emission factor includes the Organic PM.

**Seekonk Asphalt
Potential To Emit Analysis**

**HMA Loadout
Seekonk Asphalt**

Parameter	Value	Units	Source
Asphalt Volatility	-0.5	--	Default AP 42 Section 11.1, Table 11.1-14
HMA Mix Temperature	275	°F	From vendor
Emission Factor Organic PM	9.72E-05	lb/ton of HMA	Calculated, AP 42 Section 11.1, Table 11.1-14
Emission Factor TOC	1.19E-03	lb/ton of HMA	Calculated, AP 42 Section 11.1, Table 11.1-14
Emission Factor Total PM	2.78E-04	lb/ton of HMA	Calculated, AP 42 Section 11.1, Table 11.1-14
Emission Factor CO	3.85E-04	lb/ton of HMA	Calculated, AP 42 Section 11.1, Table 11.1-14
Max hourly production rate	225	tons/hr	Proposed Limit
PM Capture System	99%	--	Engineering judgement
PM Control System	95.00%	--	Blue Smoke Vendor Quote
Max yearly production	250,000	tons/year	Proposed Limit

Emission Calculations

Pollutant	Speciation (compound/Organic PM)	Speciation (compound/TOC)	Emission Factor (lb/ton HMA)	Max Hourly Emissions (lb/hr)	Potential Emissions (tons) ¹	Emission Factor Source
Criteria						
PM ₁₀	-	-	1.66E-05	3.72E-03	2.07E-03	AP 42 Section 11.1, Table 11.1-14. ^{2,3}
PM _{2.5}	-	-	1.66E-05	3.72E-03	2.07E-03	AP 42 Section 11.1, Table 11.1-14. ^{2,3}
TOC	-	-	0.00119	2.67E-01	1.48E-01	AP 42 Section 11.1, Table 11.1-14.
VOC	0.94	-	1.11E-03	2.51E-01	1.39E-01	AP 42 Section 11.1, Table 11.1-14.
CO	-	-	3.85E-04	8.65E-02	4.81E-02	AP 42 Section 11.1, Table 11.1-14.
HAPs						
Acenaphthene	0.0026	-	1.50E-08	3.38E-06	1.88E-06	AP 42 Section 11.1, Table 11.1-15.
Acenaphthylene	0.00028	-	1.62E-09	3.64E-07	2.02E-07	AP 42 Section 11.1, Table 11.1-15.
Anthracene	0.0007	-	4.05E-09	9.11E-07	5.06E-07	AP 42 Section 11.1, Table 11.1-15.
Benz(a)anthracene	0.00019	-	1.10E-09	2.47E-07	1.37E-07	AP 42 Section 11.1, Table 11.1-15.
Benzo(b)fluoranthene	0.000076	-	4.40E-10	9.89E-08	5.49E-08	AP 42 Section 11.1, Table 11.1-15.
Benzo(k)fluoranthene	0.000022	-	1.27E-10	2.86E-08	1.59E-08	AP 42 Section 11.1, Table 11.1-15.
Benzo(g,h,i)perylene	0.000019	-	1.10E-10	2.47E-08	1.37E-08	AP 42 Section 11.1, Table 11.1-15.
Benzo(a)pyrene	0.000023	-	1.33E-10	2.99E-08	1.66E-08	AP 42 Section 11.1, Table 11.1-15.
Benzo(e)pyrene	0.000078	-	4.51E-10	1.01E-07	5.64E-08	AP 42 Section 11.1, Table 11.1-15.
Chrysene	0.00103	-	5.96E-09	1.34E-06	7.45E-07	AP 42 Section 11.1, Table 11.1-15.
Dibenzo(a,h)anthracene	0.0000037	-	2.14E-11	4.81E-09	2.67E-09	AP 42 Section 11.1, Table 11.1-15.
Fluoranthene	0.0005	-	2.89E-09	6.51E-07	3.61E-07	AP 42 Section 11.1, Table 11.1-15.
Fluorene	0.0077	-	4.45E-08	1.00E-05	5.57E-06	AP 42 Section 11.1, Table 11.1-15.
Indeno(1,2,3-cd)pyrene	0.0000047	-	2.72E-11	6.12E-09	3.40E-09	AP 42 Section 11.1, Table 11.1-15.
2-Methylnaphthalene	0.0238	-	1.38E-07	3.10E-05	1.72E-05	AP 42 Section 11.1, Table 11.1-15.
Naphthalene	0.0125	-	7.23E-08	1.63E-05	9.04E-06	AP 42 Section 11.1, Table 11.1-15.
Perylene	0.00022	-	1.27E-09	2.86E-07	1.59E-07	AP 42 Section 11.1, Table 11.1-15.
Phenanthrene	0.0081	-	4.68E-08	1.05E-05	5.86E-06	AP 42 Section 11.1, Table 11.1-15.
Pyrene	0.0015	-	8.67E-09	1.95E-06	1.08E-06	AP 42 Section 11.1, Table 11.1-15.
Phenol	0.018	-	1.04E-07	2.34E-05	1.30E-05	AP 42 Section 11.1, Table 11.1-15.

**Seekonk Asphalt
Potential To Emit Analysis**

Benzene	-	5.20E-04	6.17E-07	1.39E-04	7.71E-05	AP 42 Section 11.1, Table 11.1-16.
Bromomethane	-	9.60E-05	1.14E-07	2.56E-05	1.42E-05	AP 42 Section 11.1, Table 11.1-16.
Carbon Disulfide	-	1.30E-04	1.54E-07	3.47E-05	1.93E-05	AP 42 Section 11.1, Table 11.1-16.
Chloroethane	-	2.10E-06	2.49E-09	5.60E-07	3.11E-07	AP 42 Section 11.1, Table 11.1-16.
Chloromethane	-	1.50E-04	1.78E-07	4.00E-05	2.22E-05	AP 42 Section 11.1, Table 11.1-16.
Cumene	-	1.10E-03	1.30E-06	2.93E-04	1.63E-04	AP 42 Section 11.1, Table 11.1-16.
Ethylbenzene	-	2.80E-03	3.32E-06	7.47E-04	4.15E-04	AP 42 Section 11.1, Table 11.1-16.
Formaldehyde	-	8.80E-04	1.04E-06	2.35E-04	1.30E-04	AP 42 Section 11.1, Table 11.1-16.
Hexane	-	1.50E-03	1.78E-06	4.00E-04	2.22E-04	AP 42 Section 11.1, Table 11.1-16.
Isooctane (2,2,4-Trimethylpentane)	-	1.80E-05	2.13E-08	4.80E-06	2.67E-06	AP 42 Section 11.1, Table 11.1-16.
Methylene Chloride	-	0.00E+00	0.00E+00	0.00E+00	0.00E+00	AP 42 Section 11.1, Table 11.1-16.
MTBE	-	0.00E+00	0.00E+00	0.00E+00	0.00E+00	AP 42 Section 11.1, Table 11.1-16.
Styrene	-	7.30E-05	8.65E-08	1.95E-05	1.08E-05	AP 42 Section 11.1, Table 11.1-16.
Tetrachloroethene	-	7.70E-05	9.13E-08	2.05E-05	1.14E-05	AP 42 Section 11.1, Table 11.1-16.
Toluene	-	2.10E-03	2.49E-06	5.60E-04	3.11E-04	AP 42 Section 11.1, Table 11.1-16.
1,1,1-Trichloroethane	-	0.00E+00	0.00E+00	0.00E+00	0.00E+00	AP 42 Section 11.1, Table 11.1-16.
Trichloroethene	-	0.00E+00	0.00E+00	0.00E+00	0.00E+00	AP 42 Section 11.1, Table 11.1-16.
Trichlorofluoromethane	-	1.30E-05	1.54E-08	3.47E-06	1.93E-06	AP 42 Section 11.1, Table 11.1-16.
Xylene	-	4.90E-03	5.81E-06	1.31E-03	7.26E-04	AP 42 Section 11.1, Table 11.1-16.

Footnotes:

[1] PTE calculated using the max annual production rate.

[2] According to AP 42 Section 11.1, Table 11.1-14 footnote b, the Total PM emission factor includes the Organic PM.

**Seekonk Asphalt
Potential To Emit Analysis**

**Storage Tanks
Seekonk Asphalt**

HMA Plants Emission Assessment Report (EPA-454/R-00-019) Typical Facility

Parameter	Value	Units	Source
Tank Capacity	18,000	gallons	HMA Emission Assessment Report
Tank Temperature	325	F	HMA Emission Assessment Report
# of storage tanks	2	--	HMA Emission Assessment Report
Scale Factor	N/A	--	--
Asphalt Fume Condensers Control	95%	--	Engineering Judgement
Max yearly production	200,000	tons/year	HMA Emission Assessment Report

Pollutant	Emission Factor (lb/year)	Emission Factor Source
Criteria		
VOC	3.2	HMA Emission Assessment Report, Table 11
CO	6	HMA Emission Assessment Report, Table 11
HAPs		
PAH	0.12	HMA Emission Assessment Report, Table 11
Benzene	0.001	HMA Emission Assessment Report, Table 11
Bromomethane	0.0031	HMA Emission Assessment Report, Table 11
2-Butanone	0.00125	HMA Emission Assessment Report, Table 11
Carbon Disulfide	0.01	HMA Emission Assessment Report, Table 11
Chloroethane	0.000125	HMA Emission Assessment Report, Table 11
Chloromethane	0.00075	HMA Emission Assessment Report, Table 11
Ethylbenzene	0.0012	HMA Emission Assessment Report, Table 11
Formaldehyde	7	HMA Emission Assessment Report, Table 11
Hexane	0.0032	HMA Emission Assessment Report, Table 11
Isooctane (2,2,4-Trimethylpentane)	0.00001	HMA Emission Assessment Report, Table 11
Methylene Chloride	0.00017	HMA Emission Assessment Report, Table 11
Phenol	0	HMA Emission Assessment Report, Table 11
Styrene	0.0035	HMA Emission Assessment Report, Table 11
Toluene	0.04	HMA Emission Assessment Report, Table 11
Xylene	0.0078	HMA Emission Assessment Report, Table 11

Conversions:

lbs/ton = 2000
hours per year = 8760

Footnotes:

- [1] Basis for storage tank emission factors is a "Typical Drum Mix Plant Asphalt Storage Tank" in Table 11 of HMA Emission Assessment Report (EPA-454/R-00-019).
- [2] Emission factors are based on a two 18,000 gallon storage tanks and 200,000 tons of HMA per year. (HMA Emissions Assessment Report, p. 17 and Footnote a to Table 11.).
- [3] Emissions are assumed to be proportional the Typical Facility on a tons per year of HMA produced. basis.
- [4] Scale factor based on a ratio between the tank capacities and max yearly production.
- [5] Emissions assumed to be constant throughout the year for modeling consistency.
- [6] Seekonk uses tank condensers but conservatively did not take credit for them in the calculations.
- [7] Tanks both use the same type of control.

Asphalt Drum Mixers, Inc.

Parameter	Value	Units	Source
Tank Capacity	30,000	gallons	ADM Equipment List
Tank Temperature	285	F	HMA Emission Assessment Report
# of storage tanks	2	--	ADM Equipment List
Scale Factor ⁴	2.1	--	Ratio of permit limit to Typical Facility HMA Production
Max yearly production	250,000	tons/year	Proposed Limit

Pollutant	Scaled Emission Factor (lb/year)	Potential Emissions (TPY)	Emission Factor For Modeling (lb/hr) ⁵
Criteria			
VOC	6.7	3.33E-03	7.61E-04
CO	12.50	6.25E-03	1.43E-03
HAPs			
PAH	2.50E-01	1.25E-04	2.85E-05
Benzene	2.08E-03	1.04E-06	2.38E-07
Bromomethane	6.46E-03	3.23E-06	7.37E-07
2-Butanone	2.60E-03	1.30E-06	2.97E-07
Carbon Disulfide	2.08E-02	1.04E-05	2.38E-06
Chloroethane	2.60E-04	1.30E-07	2.97E-08
Chloromethane	1.56E-03	7.81E-07	1.78E-07
Ethylbenzene	2.50E-03	1.25E-06	2.85E-07
Formaldehyde	1.46E+01	7.29E-03	1.66E-03
n-Hexane	6.67E-03	3.33E-06	7.61E-07
Isooctane	2.08E-05	1.04E-08	2.38E-09
Methylene Chloride	3.54E-04	1.77E-07	4.04E-08
Phenol	0.00E+00	0.00E+00	0.00E+00
Styrene	7.29E-03	3.65E-06	8.32E-07
Toluene	8.33E-02	4.17E-05	9.51E-06
Xylene	1.63E-02	8.13E-06	1.86E-06

Seekonk Asphalt
Potential To Emit Analysis

Paved Roads
Seekonk Asphalt

Parameter	Value	Units	Source
Roadway Surface Silt Loading	0.6	g/m ²	AP-42, Section Section 13.2.1 (Paved Roads), Table 13.2.1-2 (Ubiquitous Silt Loading Default Values with Hot Spot Contributions from Anti-Skid Abrasives (g/m ²))
Average Truck Weight	20	tons	Estimated
HMA Truck Capacity	15	tons	Estimated
Max Hourly Production	225	tons/hr	Proposed Limit
Max Annual Production	250,000	tons/year	Proposed Limit
Max Vehicles Per Hour ²	15	--	Calculated
Max Vehicles Per Year ²	16,667	--	Calculated
Truck Route Maximum Round Trip Distance	8,180	ft	Calculated based on Google Maps Route
Vehicle Miles Traveled per Hour	23	VMT/hr	Calculated
Vehicle Miles Traveled per Year	25,821	VMT/yr	Calculated
Minimum # of Days With Measurable Precipitation	0	days/mo	Providence Airport, conservatively assumed zero
# Hours in Period for Hourly Rainfall Mitigation Effect	720	hrs	--
Mean # Days With Measurable Precipitation	140	days/yr	AP-42 Figure 13.2.1-2
# Days in Period for Annual Rainfall Mitigation Effect	313	days/yr	--

Emission Calculations

Pollutant	Size Multiplier (lb/VMT)	Emission Factor ¹ (lb/VMT)	Max Hourly Emissions ³ (lb/hr)	Potential Emissions ³ (tons/year)	Emission Factor Source
PM ₁₀	0.0022	0.03	0.68	0.34	AP-42 Section 13.2.1, equation 1
PM _{2.5}	0.00054	0.01	0.17	0.08	AP-42 Section 13.2.1, equation 1

Footnotes:

[1] Emission factor E is calculated according to AP-42 Section 13.2.1 for emissions from paved roads, equation 1:

$$E \text{ (lbs/VMT)} = \text{Hourly Paved Road Emission Factor, } [k * (sL)^{0.91} * (W)^{1.02}]$$

k = PM size multiplier (lb/VMT) from AP-42 Table 13.2.1-1.

sL = Roadway surface silt loading (g/m²)

W = Average truck weight (tons)

**Seekonk Asphalt
Potential To Emit Analysis**

[2] Vehicles per hour and vehicles per year are based on truck capacity and asphalt production values.

[3] Hourly and annual emissions account for natural mitigation due to precipitation according to AP-42 Section 13.2.1 equations 2 and 3:

$$\text{Hourly emissions (lb/hr)} = E * (1 - 1.2P/N) * \text{VMT/hr}$$

P = Minimum number of days per month with measurable precipitation for Providence Airport, conservatively assumed zero.

N = Number of hours in period for hourly rainfall mitigation effect

$$\text{Annual emissions (tons/year)} = E * (1 - P/4N) * \text{VMT/yr}$$

P = Mean number of days per year with measurable precipitation, AP-42 Figure 13.2.1-2.

N = Number of days in period for annual rainfall mitigation effect (excludes Sundays)

Conversions:

ft/mile	5280
lb/ton	2000

**Seekonk Asphalt
Potential To Emit Analysis**

**Conveyors
Seekonk Asphalt**

Parameter	Value	Units	Source
Mean Wind Speed	9.53	mph	TF Green Airport (2016-2020)
Material Moisture Content	4.80	%	Per "Emission Estimation Technique Manual for Hot Mix Asphalt Manufacturing", moisture content ranges from 3 to 7 percent. This falls within the acceptable range for Equation 1.
Conveyor Emissions Control	75%	%	Conveyors 75% covered
Aggregate	79%	%	Provided by ADM
RAP	21%	%	Calculated
Max hourly production rate	225	tons/hr	ADM Quote
Max yearly production	250,000	tons/year	Proposed Limit
Aggregate Feed Bin Throughput	178	tons/hr	Calculated
Aggregate Feed Bin Throughput	197,500	tons/year	Calculated
RAP Feed Bin Throughput	47	tons/hr	Calculated
RAP Feed Bin Throughput	52,500	tons/year	Calculated
Aggregate/RAP Transfers Throughput	225	tons/hr	Calculated
Aggregate/RAP Transfers Throughput	250,000	tons/year	Calculated

Emission Calculations

Pollutant	Size Multiplier	Emission Factor ¹ (lb/ton)	Transfer Points	Percent Control ²	Hourly Emissions (lb/hr)	Annual Emissions (tons/year)	Emission Factor Source
Aggregate Bin:							
PM ₁₀	0.35	7.60E-04	2	0%	0.27	0.15	AP-42 Section 13.2.4 (11/06)
PM _{2.5}	0.053	1.15E-04			0.04	0.02	AP-42 Section 13.2.4 (11/06)
RAP Feed Bin:							
PM ₁₀	0.35	7.60E-04	2	0%	0.07	0.04	AP-42 Section 13.2.4 (11/06)
PM _{2.5}	0.053	1.15E-04			1.09E-02	6.04E-03	AP-42 Section 13.2.4 (11/06)
Aggregate/RAP Transfers:							
PM ₁₀	0.35	7.60E-04	5	75%	0.21	0.12	AP-42 Section 13.2.4 (11/06)
PM _{2.5}	0.053	1.15E-04			0.03	0.02	AP-42 Section 13.2.4 (11/06)

Footnotes:

[1] Transfer emissions are calculated using the drop equation in AP-42 Section 13.2.4 (11/06):

$$\text{Emission Factor (lb/ton)} = k * 0.0032 * (U/5)^{1.3} / (M/2)^{1.4}$$

k = PM Particle Size Multiplier (unitless)

U = Mean Wind Speed (mph)

M = Material Moisture Content (%)

[2] No control assumed for initial drop onto conveyors. Since conveyors are 75% enclosed, assumed 75% control.

[3] RAP and aggregate percentages from block flow diagram provided by ADM.

[4] RAP = Reclaimed Asphalt Pavement

Conversions:

lb/ton = 2000

**Seekonk Asphalt
Potential To Emit Analysis**

Emission Calculations

Pollutant	Size Multiplier	Emission Factor ² (lb/ton)	Max Hourly Emissions (lb/hr)	Potential Emissions (TPY)	Emission Factor Source
PM ₁₀	0.35	7.60E-04	1.71E-02	0.01	AP-42 Section 13.2.4
PM _{2.5}	0.053	1.15E-04	2.59E-03	0.00	AP-42 Section 13.2.4

Footnotes:

[1] Maximum hourly pile throughput is based on a total production rate of 225 tons HMA per hour. Annual throughput is based on 250,000 tons per year.

[2] Emissions calculated using emission factor determined according to AP-42 Section 13.2.4 for aggregate handling and storage piles.

$$E = k (0.0032) \times (U/5)^{1.3} / (M/2)^{1.4}$$

0.74 = k, PM size multiplier
 0.35 = k, PM₁₀ size multiplier
 0.053 = k, PM_{2.5} size multiplier
 9.53 = U, Mean Wind Speed (mph) TF Green Airport (2016-2020)
 0.7 = M, Moisture content of pile materials

Conversions:

lbs/ton = 2000

**Storage Piles Wind Erosion
Seekonk Asphalt**

Parameter	Value	Units	Source
Silt Content	1.6	%	AP-42 Table 13.2.4-1 (%) for crushed limestone
# Days with > 0.01 in. precipitation	140	days/yr	Proposed Limit
# Storage Piles	7	--	Proposed
Percentage of time that the unobstructed wind speed exceeds 12 mph	27.42	%	TF Green Airport (2016-2020)
% Control	90%	%	Enclosed on three sides with a roof
Pile Surface Area	0.59	acres	Calculated

Pollutant	Size Multiplier	Emission Factor ² (lb/ton)	Max Hourly Emissions (lb/hr) ³	Potential Emissions (TPY) ³	Emission Factor Source
PM	0.74	3.17	7.84E-03	3.43E-02	Equation 2-12 from the EPA document "Fugitive Dust Background Document and Technical Information Document for Best Available Control Measures"
PM ₁₀	0.35	3.17	3.71E-03	1.62E-02	Equation 2-12 from the EPA document "Fugitive Dust Background Document and Technical Information Document for Best Available Control Measures"
PM _{2.5}	0.053	3.17	5.61E-04	2.46E-03	Equation 2-12 from the EPA document "Fugitive Dust Background Document and Technical Information Document for Best Available Control Measures"

Footnotes:

[1] Six partially enclosed proposed storage bins each 40' x 40' in size with wall height of 12'. And one partially enclosed RAP storage bin (85' by 57') with wall height of 12'. Assume piles will not get higher than 10 feet.

[2] PM Emissions are calculated using emission factors determined according to Equation 2-12 from the EPA document "Fugitive Dust Background Document and Technical Information Document for Best Available Control Measures" dated 9/16/2017.

$$e_{TSP} (\text{lb/acre-day}) = 1.7 * (s/1.5) * [(365-p) / 235] * (f/15)$$

s = Silt content obtained for aggregates

p = Number of days with > 0.01 in. precipitation per year

f = Percentage of time that the unobstructed wind speed exceeds 12 mph at the mean pile height

[3] PM₁₀ and PM_{2.5} emissions are determined based on PM emissions using the ratios of the particle size multipliers for each particle size provided for Equation 1 in AP-42 Section 13.2.4.