Ajax Materials Corporation – Permit to Install Application No. APP-2021-0019

NOTE: A Permit to Install application can be modified from its original submittal through additional information submitted during the review process. This PDF includes additional information that was submitted after the original application submittal for the Ajax Materials Corporation – Permit to Install Application No. APP-2021-0019. It also includes the EGLE modeling report.

The information in this PDF has been available upon request but we are posting it on this website to help provide additional information for the public to prepare comments. This PDF does not contain all the information in the application which remains available upon request. If you have any questions about the information in this PDF or wish to request any additional information, please contact Ambrosia Brown at BrownA39@michigan.gov or 517-648-6216.

Appendix 1 - Particulate Emissions
Air Permit to Install
Ajax Materials, Genesee Twp, Michigan

Plant Capacity Rating	=	600	TPH		
Amount of Aggregate	=	568	TPH		
Amount of Asphalt Cement	=	32	TPH	Average AC Content 5.35%	
Yearly Production Limitation	=	876,322	TPY		
Density of Oil	=	7.40	Lbs/gal		
Oil Fuel Use	=	2.5	Gals/ton HMA Produced (#2 ruonded up)		
Specific Volume of H_2O	=	26.799	ft^3/lb @ 212 °F		
Moisture Content	=	5.00	%	Manufacturer's maximum moisture content	Avg. Aggregate Moisture Content during a 1999 test - 3.0%
Baghouse Temperature	=	300	°F		
Baghouse Fan Rating	=	100,000	ACFM		
NSPS PM Limit	=	0.04	Grain/DSCF		150

Specific Volume of H_2O = [(Specific Volume of H_2O) x (Baghouse Temperature + 460)]/(212 +460)
= [26.80 x (300 + 460)]/(212 + 460)
= 30.31 ft3/lb @ 249 °F

Amount of H_2O in Exhaust Gas = (Moisture Content/100) x (Amount of Aggregate - TPH) x (2000 Lbs/Ton)
= (5.00 /100) x (568 TPH) x (2000 lbs/ton)
= 56,800 PPH
= 946.67 Lbs./Min.

Total Volume of H_2O in Exhaust Gases = (Amount of Aggregate) x (Specific Volume of H_2O)
= (946.67 lbs/min) x (30.31 ft^3/lb)
= 28,692 ft^3/min

Exhaust Gas Flow Rate (ACFM -dry) = (Fan Rating) - (Volume of H_2O)
= (100,000 ACFM) - (28,692 ACFM)
= 71,308 ACFM

Exhaust Gas Flow Rate (DSCFM) = [(Exhaust Gas Flow Rate ACFM dry) x (70 °F + 460)]/(300 °F + 460)
= [71,308 ACFM x (70 oF + 460)/(300 oF + 460)
= 49,728 DSCFM

Allowed Hourly Particulate Emissions = (NSPS PM Limit) x (Exhaust Gas Flow Rate DSCFM) x (1 lb/7000 grains) x (60 mins/hr)
= (0.04 grain/DSCFM) x (49,728 DSCFM) x (1 lb/7,000 grains) x (60 mins/hr)
= 17.05 Lbs/Hr

*Emission factor for H2SO4 is based on prior permitting modeling results

Particulate Emission Factor (Lbs/Ton HMA) ulfur = (Allowed Hourly Particulate Emissions) / Plant Capacity Rating
= 17.05 Lbs/Hr / 600 Tons HMA/Hr
= 0.03 Lbs/Ton HMA

Requested Allowed Annual Particulate Emissions = Particulate Emission Factor (Lbs/Ton HMA) x Yearly Production Limitation
= 0.028 Lbs/Ton HMA x 876,322 Tons HMA/Yr
= 24,902 Lbs/Yr
= 12.5 Tons/Yr

Appendix 2 - Hydrogen Chloride Emissions
Air Permit to Install
Ajax Materials, Genesee Twp, Michigan

Rated Dryer Capacity	=	600	TPH
Yearly Production Limitation	=	876,322	TPY
Density of Oil	=	7.40	Lbs/gal
Maximum Halogen Content	=	4.00E-03	Lb/lb
Annual Average Halogen Content	=	3.45E-03	Lb/lb
Oil Fuel Use	=	2.0	Gals/ton HMA Produced (#2 rounded up)
Maximum Potential Oil Usage	=	1,200	Gal/hr
Molecular Weight of Chlorine	=	35.45	Moles
Molecular Weight of Hydrogen	=	1.01	Moles

Hydrogen Chloride Emission Calculations

Total Chlorine Emissions = Oil Usage (Gal/hr) x Density of Oil (Lb/gal) x Halogen Content (lb/lb)
= 1,200 gal/hr x 7.4 lb/gal x 0.0040 lb halogen/lb oil
= 35.52 lb/hr (based on 4000 ppm oil)
= 1,200 gal/hr x 7.4 lb/gal x 0.00345 lb halogen/lb oil
= 30.64 lb/hr (based on 3450 ppm oil)

HCl Emission Factor = (Molecular Weight of Chlorine + Molecular Weight of Hydrogen) / Molecular Weight of Chlorine
= (35.5 + 1.01) / 35.5
= 1.03 lb HCl/lb Cl

Maximum Potential HCl Emissions = Total Chlorine Emissions (lbs/hr) x HCl Emission Factor
= 35.52 lbs Cl/hr x 1.03 lb HCl/lb Cl
= 36.53 lbs/hr (based on 4000 ppm oil)
= 30.64 lbs Cl/hr x 1.03 lb HCl/lb Cl
= 31.51 lbs/hr (based on 3450 ppm oil)

HCl Emission Factor = Maximum Potential HCl Emissions (lbs/hr) / Rated Dryer Capacity (tons/hr)
= 36.53 lbs/hr / 600 tons HMA/hr
= 0.0609 lb HCl/ton HMA Produced (based on 1000 ppm oil)
= 0.053 lb HCl/ton HMA Produced (based on 3450 ppm oil)

Expected reduction in the theoretical HCl emission rate of 61%.

Expected HCl Emission Factor = HCl Emission Factor x (1 - stack test reduction)
= 0.061 x (1 - 0.61)
= 0.024 lb HCl/ton HMA Produced (based on 4000 ppm oil)
= 0.020 lb HCl/ton HMA Produced (based on 3450 ppm oil)

HCl Short Term and Annual Emissions

Short Term Emissions = HCL Emission Factor x Hourly Production
= 0.024 lb/ton X 600 tph
= 14.247 lb/hr

Annual Emissions = HCL Emission Factor x Annual Production / 2000 lb/ton
= 0.020 lb/ton X 876,322 tpy / 2000 lb/ton
= 8.8 ton/yr

Predicted Ambient Impacts

Annual PAI (ITSL)
Annual Model Results = 0.018 (µg/m3)/(lb/hr)
Predicted Ambient Impact = HCL Emissions (lb/hr) X Model Results (µg/m3)/(lb/hr)
= 14.247 lb/hr X 0.018 (µg/m3)/(lb/hr)
= 2.53E-01 µg/m3
AQD Screening Level = 20 µg/m3 Annual averaging period
Percent of Screening Level = 1.3%
Pass YES

Short Term PAI (2nd ITSL)
1 hr Model Results = 0.711 (µg/m3)/(lb/hr)
Predicted Ambient Impact = HCL Emissions (lb/hr) X Model Results (µg/m3)/(lb/hr)
= 14.247 lb/hr X 0.711 (µg/m3)/(lb/hr)
= 10.1 µg/m3
AQD Screening Level = 2100 µg/m3 1 hr averaging period
Percent of Screening Level = 0.5%
Pass YES

Appendix 3 - EGLE Additional Source and Background Concentration Data
Air Permit to Install
Ajax Materials, Genesee Twp, Michigan

	NO2 Lansing		PM-10 Grand Rapids	PM-2.5 Flint		SO2 Grand Rapids			
Year	1-hr 98th pctl	Annual Avg	24-hr Max	24-hr 98th pctl	Annual Avg	1-hr 99th pctl	3-hr Max	24-hr Max	Annual Avg
2017	36.4	6.5	34.0	16.8	7.10	4.0	3.0	1.5	0.38
2018	29.9	6.5	31.0	16.9	7.33	4.4	3.9	1.1	0.12
2019	44.1	6.4	104.0	17.5	6.81	3.9	3.1	0.9	0.39
	36.8	**6.5**		**17.1**	**7.1**	**4.1**	**3.9**	**1.5**	**0.39**
	ppb	ppb		ug/m3	ug/m3	ppb	ppb	ppb	ppb

NAAQS MODELING BACKGROUND SUMMARY

NO2		PM-10	PM-2.5		SO2			
69.2	12.2	35.0	17.1	7.1	10.7	10.2	3.9	1.0
ug/m3	**ug/m3**	ug/m3	**ug/m3**	**ug/m3**	ug/m3	ug/m3	ug/m3	ug/m3
		(3-yr 4th High)						

Table 1 – Project Emission Summary ***(Revised June 2021)***
Air Permit to Install
Ajax Materials, Genesee Twp, Michigan

Pollutant	HMA Dryer Emissions (tpy)	AC Tank Heater Emissions (tpy)	Silo Load Out (tpy)	Silo Filling (tpy)	Yard Emissions (Unpaved Vehicle Traffic, Aggregate Load in/Load out and Storage Pile Wind Erosion) (tpy)	Paved Road Emissions (tpy)	TOTAL Emissions (tpy)	Significant Emission Rate	% of SER	Exceeds SER?	PSD Major Source Threshold	Exceeds Major Source Threshold
CO	88.1	0.7	0.6	0.5	--	--	89.9	***100***	90%	No	***250***	No
NO_X	52.6	0.9	--	--	--	--	53.4	***40***	134%	Yes	***250***	No
PM	15.9	0.0	0.2	0.3	9.0	0.6	26.0	***25***	104%	Yes	***250***	No
PM_{10}	29.1	0.1	0.4	0.4	3.1	0.1	33.1	***15***	221%	Yes	***250***	No
$PM_{2.5}$	29.1	0.1	0.4	0.4	0.3	2.93E-02	30.3	***10***	303%	Yes	***250***	No
SO_2	78.0	0.0	--	--	--	--	78.1	***40***	195%	Yes	***250***	No
VOC	28.0	0.0	1.7	5.3	--	--	35.1	***40***	88%	No	***250***	No
CO_2	21,689	1,024.7	--	--	--	--	22,713.7	***See CO2e***				
CH_4	7.9	0.0	--	--	--	--	7.9					
N_2O	--	0.0	--	--	--	--	0.0					
CO_2e	21,886	1,025.8	--	--	--	--	22,911.9	***75,000***	31%	No	NA	NA
Lead	0.01	0.0	--	--	--	--	0.0	***0.6***	2%	No	NA	NA
Fluorides	--	--	--	--	--	--	-	***3.0***	0%	No	NA	NA
H_2S	--	--	--	--	--	--	-	***10.0***	0%	No	NA	NA
H_2SO_4	1.4	--	--	--	--	--	1.4	***7***	20%	No	NA	NA
Highest Single HAP (Formaldehyde	4.4	6.44E-04	1.60E-03	--	--	--	4.4	***NA***	NA	NA	NA	No
Aggregate HAPs*	22.9	0.02	0.04	0.08	--	--	23.0	***NA***	NA	NA	NA	No

*Will limit single HAPs to 8.9 tpy, and aggregate HAPs to 22.5 tpy.

Note - Control efficiency of 80% for an approved fugitive dust control plan - per MDEQ HMA Fact sheet could be used for the yard emissions from storage pile wind erosion and load in/load out. The Control Effeciency of 0% was conservative for use in modeling.

PSD Listed Source Categories with 100 tpy Major Source Thresholds[1]

1. Fossil fuel-fired steam electric plants of more than 250 million Btu/hr heat input
2. Coal cleaning plants (with thermal dryers)
3. Kraft pulp mills
4. Portland cement plants
5. Primary zinc smelters
6. Iron and steel mill plants
7. Primary aluminum ore reduction plants
8. Primary copper smelters
9. Municipal incinerators capable of charging more than 250 tons of refuse per day
10. Hydrofluoric acid plants
11. Sulfuric acid plants
12. Nitric acid plants
13. Petroleum refineries
14. Lime plants
15. Phosphate rock processing plants
16. Coke oven batteries
17. Sulfur recovery plants
18. Carbon black plants
19. Primary lead smelters
20. Fuel conversion plants
21. Sintering plants
22. Secondary metal production plants
23. Chemical process plants
24. Fossil fuel boilers (or combinations thereof) totaling more than 250 million Btu/hr heat input
25. Petroleum storage and transfer units with a total storage capacity exceeding 300,000 barrels
26. Taconite ore processing plants
27. Glass fiber processing plants
28. Charcoal production plants

[1] Please be aware that any other source which has the potential to emit 250 tons per year of any regulated pollutant is subject to PSD major source regulations regardless of the sources manufacturing operations.

Table 2 - HMA Counter-flow Drum Dryer NSR Regulated Pollutant Estimated Emissions

Air Permit to Install

Ajax Materials, Genesee Twp, Michigan

Maximum Short Term Production	tons HMA/hr	600
Daily Average Production	tons HMA/hr	500
Annual Production Limit	tons HMA/yr	876,322
Types of Fuel Permitted	Natural Gas, Propane , Fuel Oil 2-6, RUO	
Density of Fuel Oil (avg)	lb/gal	7.4
Fuel Oil/RUO Sulfur Content	% by weight	1.0

WebFirename	NSR Regulated Pollutant	Emission Factor (see notes)	Notes	Maximum Short Term Emissions (lb/hr)	Annual Emissions (tpy)		WF EF
CO	CO	0.201 lb/ton HMA	1	120.6	88.1		#VALUE!
Nox	NO_X	0.12 lb/ton HMA	1	72.0	52.6		0.055
PM10 F	PM	0.04 lb/ton HMA	3	21.8	15.9	AP-42 condensable	28.0
PM10	PM_{10}	0.07 lb/ton HMA	3,9	33.2	29.1	0.0194	6.4
PM2.5	$PM_{2.5}$	0.07 lb/ton HMA	3,9	33.2	29.1		1.5
SO2	SO_2	0.18 lb/ton HMA	2	106.9	78.0		0.1
VOC	VOC	6.4E-02 lb/ton HMA	4	38.4	28.0	0.2	0.032
CO2	CO_2	49.5 lb/ton HMA	5	29,700	21,689		33.0
CH4	CH_4	1.8E-02 lb/ton HMA	5	10.8	7.9		0.012
N2O	N_2O	-- --		--	--		
CO2	CO_2e	49.95 lb/ton HMA	6	29,970	21,886		
	Lead	3.0E-05 lb/ton HMA	7	0.02	0.01		1.50E-05
	Fluorides	-- --		--	--		
	H_2S	-- --		--	--		
	H_2SO_4	3.2E-03 lb/ton HMA	8	1.9	1.4		

[1] Emission factor is from the MDEQ Emission Factor Calculation Fact Sheet for HMA Plants waste oil asphalt heaters (3-05-002-10) for CO; and batch plant factor (3-05-002-46) for NOX.

[2]Emission factor is based on RUO sulfur content of 1% and a 43% control for SO2 from RAP - See SO2/RAP calculation methodology below

[3] PM emissions are based on NSPS emission limit of 0.4 grains/DSCF. See Appendix 2 for particulate emission calculation data. PM10 and PM2.5 emissions are based on PM emissions plus AP-42 condensible emissions, plus H2SO4 and HCL emissions, which are assumed to form condensible PM.

[4]VOC emission factor from AP-42, Section 11.1, Table 11.1-8 for waste oil fired dryer, plus a 100% safety factor.

[5]Emission factor is from EPA Webfire emission factor for #6 oil-fired counterflow drum mix plant (3-05-002-63); plus a 50% safety factor

[6] CO_2e emision factor based on global warming potentials for CO2 (1), CH4 (25) and N2O (298) obtained from 40 CFR 98 Subparts A and C, respectively.

[7]Lead emission factor is based on maximum ppm allowed in RUO (100 ppm) and 98% control for baghouse, as follows:
7.4 lb/gal * 100 ppm/1e6 X 2 gal oil/ton HMA X (1-.98)

[8]AQD Default Allowable Emission Rate from June 2012 "Eliminating the Mandatory Testing Requirement for Toxic Air Contaminants for Hot Mix Asphalt Plants in Michigan"

[9]lb/hr emission rates based on daily average production

__Emission Calculation Methods__

PM

See particulate emission calculation methodology. Particulate is assumed to be less than 10 microns in diameter.

SO_2 (RAP)

Design Capacity Emissions (lb/hr) = [Design Material Usage (ton of HMA/hr) x Unit Fuel Consumption (gal/ton) x Fuel Density (lb/gal) x (Sulfur Content (% by Weight)/100) x 64 (lb SO_2)/32 (lb S)] x (1 - (43 (% SO_2 control for RAP)/100))

Potential Emissions (lb/hr) = [Permit Limit Material Usage (ton of HMA/hr) x Unit Fuel Consumption (gal/ton) x Fuel Density (lb/gal) x (Sulfur Content (% by Weight)/100) x 64 (lb SO_2)/32 (lb S)/((1/2000) (lb/ton)] x (1 - (43 (% SO_2 control for RAP)/100))

Expected Emissions (lb/hr) = [Expected Material Usage (ton of HMA/hr) x Unit Fuel Consumption (gal/ton) x Fuel Density (lb/gal) x (Sulfur Content (% by Weight)/100) x 64 (lb SO_2)/32 (lb S)/((1/2000) (lb/ton))] x (1 - (43 (% SO_2 control for RAP)/100))

NO_x CO, VOC

Design Capacity Emissions (lb/hr) = Design Material Usage (ton of HMA/hr) x Emission Factor (lb/ton)

Potential Emissions (ton/yr) = Permit Limit Material Usage (ton of HMA/yr) x Emission Factor (lb/ton) x 1/2000 (ton/lb)

Expected Emissions (ton/yr) = Expected Material Usage (ton of HMA/yr) x Emission Factor (lb/ton) x 1/2000 (ton/lb)

CO_2e

CO_2e (lb/hr) = CO_2 (lb/hr) x 1 + CH_4 (lb/hr) x 25 + N_2O (lb/hr) x 298

E_{ST} = Maximum Short Term HMA Production (ton HMA/hr) X EF

E_A = E_F X Annual Production Limit (ton HMA/yr) / 2,000 lb/ton

where:

E_{ST} = Short Term Emissions (lb/hr);

E_A = Annual Emissions (tpy);

EF = emission factor (lb/ton HMA)

Grade	Heating Value (Btu/US gal)		Comments	density (lb/gal)	Fuel - gal/hr	Fuel - gal/ton	Fuel (lb/ton)	Max S Content	Sulfur (lb/ton)
Fuel Oil No. 1	132900	137000	Small Space Heaters	6.88	1128.668172	1.88	12.94	0.50%	0.06
Fuel Oil No. 2	137000	141800	Residential Heating	7.05	1094.890511	1.82	12.86	0.50%	0.06
Fuel Oil No. 4	143100 - 148100		Industrial Burners						
Fuel Oil No. 5 (Light)	146800 - 150000		Preheating in General Required						
Fuel Oil No.5 (Heavy)	149400 - 152000		Heating Required						
Fuel Oil No. 6	151300	155900	Bunker C	7.88	991.4077991	1.65	13.02	1.0%	0.13

Burner

150 MMBtu/hr Low NOX (assumed)

137000 Btu/gal

gal/hr

1.65 gal/ton

Table 1. Stack Sampling Data Summary

Toxic Air Contaminant	High test value, lb/ton	Low test value, lb/ton	Average test value, lb/ton	Standard Deviation	Default Allowable Limit, lb/ton
Acrolein	8.83E-4	4.00E-6	1.52E-4	0.00024	1.00E-3
Arsenic	8.32E-7	5.25E-8	2.64E-7	2.68E-7	1.00E-6
Benzene	8.94E-4	3.80E-5	3.61E-4	0.00024	1.00E-3
Ethyl benzene	4.00E-4	5.46E-6	8.67E-5	0.00013	1.00E-3
Formaldehyde	4.30E-5	2.00E-3	1.25E-3	0.0013	1.00E-2
Hydrogen chloride	1.25E-3	2.40E-5	3.44E-4	0.00034	6.00E-3
Lead	3.50E-6	2.11E-9	1.36E-6	9.25E-7	1.50E-5
Manganese	3.50E-5	1.18E-6	9.24E-6	1.04E-5	5.00E-5
Napthalene	2.00E-4	6.20E-6	5.47E-5	5.95E-5	1.00E-3
Nickel	3.39E-6	1.62E-7	1.54E-6	1.12E-6	1.00E-4
Sulfuric acid mist	2.20E-3	4.00E-5	7.87E-4	7.40E-4	3.20E-3
Toluene	1.63E-3	6.55E-7	2.70E-4	1.6E-4	6.00E-3
Xylene	4.94E-4	1.33E-6	1.39E-4	1.60E-4	1.00E-3

Units	FACTORID	SCC	SCCID	LEVEL1	LEVEL2	LEVEL3	LEVEL4	NEI_POLLU	CAS	POLLUTAN	POLLUTAN'	CONTROLC	CONTROLI[	CONTROL	Primary
/															
Lb/Tons	17978	30500263	5510	Industrial Prc	Mineral Pr	Asphalt Co	Drum Mix I	NOX		Nitrogen o	303	0	129	UNCONTROLLED	
Lb/Tons															
Lb/Tons															
Lb/Tons															
Lb/Tons	18022	30500263	5510	Industrial Prc	Mineral Pr	Asphalt Co	Drum Mix I	SO2	2025884	Sulfur diox	380	0	129	UNCONTROLLED	
Lb/Tons	18034	30500263	5510	Industrial Prc	Mineral Pr	Asphalt Co	Drum Mix I	VOC		Volatile org	417	0	129	UNCONTROLLED	
Lb/Tons	17925	30500263	5510	Industrial Prc	Mineral Pr	Asphalt Co	Drum Mix I	CO2	124-38-9	Carbon dio	136	0	129	UNCONTROLLED	
Lb/Tons	17968	30500263	5510	Industrial Prc	Mineral Pr	Asphalt Co	Drum Mix Pl: Rotary D		74-82-8	Methane	261	0	129	UNCONTROLLED	
/															
/															
Lb/Tons	17585	30500260	5507	Industrial Prc	Mineral Pr	Asphalt Co	Drum Mix I	7439921	7439-92-1	Lead	250	127	188	FABRIC FILTER	
/															
/															
/															

SO2 (lb/ton)	43% Control - RAP
0.13	0.07
0.13	0.07
0.26	0.15

FACTOR	UNIT	MEASURE	MATERIAL	ACTION	FORMULA	AP42SECTI	NOTES	REF_DESC	QUALITY	NUMSOUR	Created	REVOKED	Dupcount	Dupreason
5.50E-02	Lb	Tons	Hot Mix As Produced			11.1		EPA. 2000	C	0	36861		0	
5.80E-02	Lb	Tons	Hot Mix As Produced			11.1		EPA. 2000	B	0	36861		0	
3.20E-02	Lb	Tons	Hot Mix As Produced			11.1	VOC equals	EPA. 2000	E	0	00:00.0		0	
33	Lb	Tons	Hot Mix As Produced			11.1	CO2 can al	EPA. 2000	A	0	36861		0	
0.012	Lb	Tons	Hot Mix As Produced			11.1		EPA. 2000	C	0	36861		0	
0.000015	Lb	Tons	Hot Mix As Produced			11.1		EPA. 2000	C	0	36861		0	

Table 3 - HMA Counter-flow Drum Dryer TAC Emissions

Air Permit t Air Permit to Install

Ajax Mater Ajax Materials, Genesee Twp, Michigan

Material Usage	tons/hr	600
Annual Production Limit	tons HMA/yr	876,322

CAS No hyphens	Toxic Air Contaminant	CAS No.	Emission Factor (see notes)	Note	Maximum Short Term Emissions (lb/hr)	Annual Emissions (tpy)	HAP?
100414	Ethylbenzene	100-41-4	1.0E-03 lb/ton HMA	1	6.00E-01	0.44	Yes
100527	Benzaldehyde	100-52-7	2.2E-04 lb/ton HMA	5	1.32E-01	0.10	No
106514	Quinone	106-51-4	3.5E-04 lb/ton HMA	3	2.11E-01	0.15	Yes
106978	n-Butane	106-97-8	1.3E-03 lb/ton HMA	5	8.04E-01	0.59	No
107028	Acrolein	107-02-8	1.0E-03 lb/ton HMA	1	6.00E-01	0.44	Yes
108883	Toluene	108-88-3	6.0E-03 lb/ton HMA	1	3.60E+00	2.63	Yes
109660	N-Pentane	109-66-0	4.2E-04 lb/ton HMA	5	2.52E-01	0.18	No
109671	1-Pentene	109-67-1	4.4E-03 lb/ton HMA	5	2.64E+00	1.93	No
110543	N-Hexane	110-54-3	2.0E-03 lb/ton HMA	3	1.21E+00	0.89	Yes
110623	Valeraldehyde	110-62-3	1.3E-04 lb/ton HMA	5	8.04E-02	0.06	No
120127	Anthracene	120-12-7	6.8E-06 lb/ton HMA	3	4.09E-03	2.99E-03	Yes
123386	Propionaldehyde	123-38-6	2.9E-04 lb/ton HMA	3	1.72E-01	0.13	Yes
123728	Butyraldehyde	123-72-8	3.2E-04 lb/ton HMA	5	1.92E-01	0.14	No
129000	Pyrene	129-00-0	6.6E-06 lb/ton HMA	3	3.96E-03	0.00	Yes
1330207	Isomers of xylene	1330-20-7	1.0E-03 lb/ton HMA	1	6.00E-01	0.44	Yes
142825	Heptane	142-82-5	1.9E-02 lb/ton HMA	5	1.13E+01	8.24	No
1746016	2,3,7,8-Tetrachlorodibenzo-p-dioxin	1746-01-6	4.6E-13 lb/ton HMA	3	2.77E-10	2.02E-10	Yes
18540299	Chromium (VI)	18540-29-9	3.0E-06 lb/ton HMA	2	1.80E-03	1.31E-03	Yes
191242	Benzo (g,h,i) perylene	191-24-2	8.8E-08 lb/ton HMA	3	5.28E-05	3.86E-05	Yes
192972	Benzo (e) pyrene	192-97-2	2.4E-07 lb/ton HMA	3	1.45E-04	1.06E-04	Yes
193395	Indeno(1,2,3-cd)pyrene	193-39-5	1.5E-08 lb/ton HMA	3	9.24E-06	6.75E-06	Yes
19408743	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	19408-74-3	2.2E-12 lb/ton HMA	3	1.29E-09	9.45E-10	Yes
198550	Perylene	198-55-0	1.9E-08 lb/ton HMA	3	1.16E-05	8.48E-06	Yes
205992	Benzo (b) fluoranthene	205-99-2	2.2E-07 lb/ton HMA	3	1.32E-04	9.64E-05	Yes
206440	Fluoranthene	206-44-0	1.3E-06 lb/ton HMA	3	8.05E-04	0.00	Yes
207089	Benzo (k) fluoranthene	207-08-9	9.0E-08 lb/ton HMA	3	5.41E-05	3.95E-05	Yes
208968	Acenaphthylene	208-96-8	4.8E-05 lb/ton HMA	3	2.90E-02	0.02	Yes
218019	Chrysene	218-01-9	4.0E-07 lb/ton HMA	3	2.38E-04	1.74E-04	Yes
3268879	Octachlorodibenzo-p-dioxins, total	3268-87-9	5.9E-09 lb/ton HMA	3	3.56E-06	2.60E-06	Yes
34465468	Hexachlorodibenzo-p-dioxins, total	34465-46-8	1.2E-11 lb/ton HMA	3	7.13E-09	5.21E-09	Yes
35822469	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	35822-46-9	7.5E-11 lb/ton HMA	3	4.49E-08	3.28E-08	Yes
39001020	Octachlorodibenzofurans, total	39001-02-0	1.1E-11 lb/ton HMA	3	6.34E-09	4.63E-09	Yes
39227286	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	39227-28-6	9.2E-13 lb/ton HMA	3	5.54E-10	4.05E-10	Yes
40321764	1,2,3,7,8-Pentachlorodibenzo-p-dioxin	40321-76-4	6.8E-13 lb/ton HMA	3	4.09E-10	2.99E-10	Yes
4170303	2-Butenal	4170-30-3	1.7E-04 lb/ton HMA	5	1.03E-01	0.08	No
50000	Formaldehyde	50-00-0	1.0E-02 lb/ton HMA	1	6.00E+00	4.38	Yes
50328	Benzo (a) pyrene	50-32-8	2.2E-08 lb/ton HMA	3	1.29E-05	9.45E-06	Yes
51207319	2,3,7,8-Tetrachlorodibenzofuran	51207-31-9	2.1E-12 lb/ton HMA	3	1.28E-09	9.35E-10	Yes
513359	2-Methyl-2-butene	513-35-9	1.2E-03 lb/ton HMA	5	6.96E-01	0.51	No
540841	2,2,4-Trimethylpentane	540-84-1	8.8E-05 lb/ton HMA	3	5.28E-02	0.04	Yes
55673897	1,2,3,4,7,8,9-Heptachlorodibenzofuran	55673-89-7	5.9E-12 lb/ton HMA	3	3.56E-09	2.60E-09	Yes
56553	Benzo (a) anthracene	56-55-3	4.6E-07 lb/ton HMA	3	2.77E-04	2.02E-04	Yes
57117314	2,3,4,7,8-Pentachlorodibenzofuran	57117-31-4	1.8E-12 lb/ton HMA	3	1.11E-09	8.10E-10	Yes
57117416	1,2,3,7,8-Pentachlorodibenzofuran	57117-41-6	9.5E-12 lb/ton HMA	3	5.68E-09	4.15E-09	Yes
57117449	1,2,3,6,7,8-Hexachlorodibenzofuran	57117-44-9	2.6E-12 lb/ton HMA	3	1.58E-09	1.16E-09	Yes
57653857	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	57653-85-7	2.9E-12 lb/ton HMA	3	1.72E-09	1.25E-09	Yes
590863	Isovaleraldehyde	590-86-3	6.4E-05 lb/ton HMA	5	3.84E-02	0.03	No
60851345	2,3,4,6,7,8-Hexachlorodibenzofuran	60851-34-5	3.5E-12 lb/ton HMA	3	2.11E-09	1.54E-09	Yes
66251	Hexanal	66-25-1	2.2E-04 lb/ton HMA	5	1.32E-01	0.10	No
67562394	1,2,3,4,6,7,8-Heptachlorodibenzofuran	67562-39-4	2.4E-11 lb/ton HMA	3	1.45E-08	1.06E-08	Yes
67641	Acetone	67-64-1	1.7E-03 lb/ton HMA	5	9.96E-01	0.73	No
70648269	1,2,3,4,7,8-Hexachlorodibenzofuran	70648-26-9	1.2E-11 lb/ton HMA	3	7.13E-09	5.21E-09	Yes
71432	Benzene	71-43-2	1.0E-03 lb/ton HMA	1	6.00E-01	0.44	Yes
71556	1,1,1-Trichloroethane	71-55-6	1.1E-04 lb/ton HMA	3	6.34E-02	0.05	Yes
72918219	1,2,3,7,8,9-Hexachlorodibenzofuran	72918-21-9	1.8E-11 lb/ton HMA	3	1.11E-08	8.10E-09	Yes
7439965	Manganese	7439-96-5	5.0E-05 lb/ton HMA	1	3.00E-02	0.02	Yes
7439976	Mercury	7439-97-6	1.0E-06 lb/ton HMA	8	6.24E-04	4.56E-04	Yes
7440020	Nickel	7440-02-0	1.0E-04 lb/ton HMA	1	6.00E-02	0.04	Yes
7440224	Silver	7440-22-4	1.9E-06 lb/ton HMA	9	1.15E-03	8.41E-04	No
7440280	Thallium	7440-28-0	8.8E-06 lb/ton HMA	6	5.28E-03	3.86E-03	No
7440360	Antimony	7440-36-0	7.2E-07 lb/ton HMA	8	4.32E-04	3.15E-04	Yes
7440382	Arsenic	7440-38-2	3.0E-06 lb/ton HMA	2	1.80E-03	0.00	Yes
7440393	Barium	7440-39-3	1.0E-03 lb/ton HMA	6	6.00E-01	0.44	No
7440417	Beryllium	7440-41-7	0.0E+00 lb/ton HMA	8	0.00E+00	0.00	Yes
7440439	Cadmium	7440-43-9	1.0E-06 lb/ton HMA	2	6.00E-04	0.00	Yes
7440473	Chromium	7440-47-3	3.0E-06 lb/ton HMA	2	1.80E-03	0.00	Yes
7440484	Cobalt	7440-48-4	6.0E-05 lb/ton HMA	7	3.60E-02	0.03	Yes
7440508	Copper	7440-50-8	6.8E-04 lb/ton HMA	6	4.08E-01	0.30	No
7440666	Zinc	7440-66-6	7.2E-04 lb/ton HMA	6	4.32E-01	0.32	No
74851	Ethylene	74-85-1	1.4E-02 lb/ton HMA	5	8.40E+00	6.13	No
75070	Acetaldehyde	75-07-0	2.9E-03 lb/ton HMA	3	1.72E+00	1.25	Yes
763291	2-Methyl-1-pentene	763-29-1	8.0E-03 lb/ton HMA	5	4.80E+00	3.51	No
7647010	Hydrogen chloride	7647-01-0	2.4E-02 lb/ton HMA	10	1.42E+01	8.8	Yes
7723140	Phosphorus (yellow or white)	7723-14-0	4.8E-03 lb/ton HMA	7	2.88E+00	2.10	Yes
7782492	Selenium	7782-49-2	9.6E-06 lb/ton HMA	7	5.76E-03	0.00	Yes
78933	Methyl ethyl ketone	78-93-3	4.0E-05 lb/ton HMA	5	2.40E-02	0.02	No
83329	Acenaphthene	83-32-9	3.1E-06 lb/ton HMA	3	1.85E-03	0.00	Yes
85018	Phenanthrene	85-01-8	5.1E-05 lb/ton HMA	3	3.04E-02	0.02	Yes
86737	Fluorene	86-73-7	2.4E-05 lb/ton HMA	3	1.45E-02	0.01	Yes
91203	Naphthalene	91-20-3	1.0E-03 lb/ton HMA	1	6.00E-01	0.44	Yes
91576	2-Methyl Naphthalene	91-57-6	3.7E-04 lb/ton HMA	3	2.24E-01	0.16	Yes
96140	3-Methylpentane	96-14-0	4.2E-04 lb/ton HMA	5	2.51E-01	0.18	No
	Heptachlorodibenzofurans, total		8.4E-11 lb/ton HMA	5	5.02E-08	3.66E-08	Yes
	Heptachlorodibenzo-p-dioxins, total		1.6E-10 lb/ton HMA	5	9.37E-08	6.84E-08	Yes
	Hexachlorodibenzofurans, total		1.8E-11 lb/ton HMA	5	1.07E-08	7.81E-09	Yes
	Pentachlorodibenzofurans, total		1.6E-10 lb/ton HMA	5	9.77E-08	7.13E-08	Yes
	Pentachlorodibenzo-p-dioxins, total		4.8E-11 lb/ton HMA	5	2.90E-08	2.12E-08	Yes
	Polychlorinated dibenzofurans, total		3.3E-10 lb/ton HMA	5	1.98E-07	1.45E-07	Yes
	Polychlorinated dibenzo-p-dioxins and furans, total		6.6E-09 lb/ton HMA	5	3.96E-06	2.89E-06	Yes
	Polychlorinated dibenzo-p-dioxins, total		6.2E-09 lb/ton HMA	5	3.70E-06	2.70E-06	Yes
	Tetrachlorodibenzofurans, total		7.3E-11 lb/ton HMA	5	4.36E-08	3.18E-08	Yes
	Tetrachlorodibenzo-p-dioxins, total		2.0E-12 lb/ton HMA	5	1.23E-09	8.96E-10	Yes

[1]Emission factor is AQD Default Allowable Emission Rate from June 2012 *Eliminating the Mandatory Testing Requirement for Toxic Air Contaminants for Hot Mix Asphalt Plants in*

[2] Emission factor is based on maximum ppm allowed in RUO and 98% control for baghouse, as follows: 7.4 lb/gal * 100 ppm/1e6 X 2 gal oil/ton HMA X (1-.98). Max ppm allowed for Arsenic is 5 ppm. Max ppm allowed for Cr is 10 ppm. Max ppm allowed for Cd is 2 ppm.

[3]Emission factor is based on #6 Oil-Fired Counterflow Drum Mix HMA Plant (3-05-002-63): plus a Gaseous HAP safety factor of 2.2

[4]Emission factor is based on #2 Oil-Fired Counterflow Drum Mix HMA Plant (3-05-002-60): plus a Gaseous HAP safety factor of 2.2

[5]Emission factor is based on #6 Oil-Fired Counterflow Drum Mix HMA Plant (3-05-002-63): plus a Gaseous TAC safety factor of 2.0

[6]Emission factor is based on #2 Oil-Fired Counterflow Drum Mix HMA Plant (3-05-002-60): plus a Metal TAC safety factor of 4

[7]Emission factor is based on #2 Oil-Fired Counterflow Drum Mix HMA Plant (3-05-002-60): plus a Metal HAP safety factor of 4

[8]Emission factor is based on #6 Oil-Fired Counterflow Drum Mix HMA Plant (3-05-002-63): plus a Metal HAP safety factor of 4

	Pollutant	CAS	MAX	Natural Gas Drum Mix PlantSCC			Natural Gas Counterflow Drum			#2 Oil-Fired Drum Mix PlantSCC			#2 Oil-Fired Counterflow Drum			#6 Oil-Fired Drum Mix PlantSCC		#6 Oil-Fired Counterflow Drum Mix PlantSCC 30500263	
	Ethylbenze	100-41-4	2.40E-04		0.00024	Tons/Hot M		0.00024	Tons/Hot M		0.00024	Tons/Hot M		0.00024	Tons/Hot M	0.00024	Tons/Hot M	0.00024	Tons/Hot Mix Asphalt
	Benzaldehy	100-52-7	1.10E-04	---		---	---		---	---		---	---		---	0.00011	Tons/Hot M	0.00011	Tons/Hot Mix Asphalt
	Quinone	106-51-4	1.60E-04	---		---	---		---	---		---	---		---	0.00016	Tons/Hot M	0.00016	Tons/Hot Mix Asphalt
	n-Butane	106-97-8	6.70E-04		0.00067	Tons/Hot M		0.00067	Tons/Hot M		0.00067	Tons/Hot M		0.00067	Tons/Hot M	0.00067	Tons/Hot M	0.00067	Tons/Hot Mix Asphalt
	Acrolein	107-02-8	2.60E-05	---		---	---		---	---		---	---		---	0.000026	Tons/Hot M	0.000026	Tons/Hot Mix Asphalt
	Toluene	108-88-3	2.90E-03		0.00015	Tons/Hot M		0.00015	Tons/Hot M		0.0029	Tons/Hot M		0.0029	Tons/Hot M	0.0029	Tons/Hot M	0.0029	Tons/Hot Mix Asphalt
	N-Pentane	109-66-0	2.10E-04		0.00021	Tons/Hot M		0.00021	Tons/Hot M		0.00021	Tons/Hot M		0.00021	Tons/Hot M	0.00021	Tons/Hot M	0.00021	Tons/Hot Mix Asphalt
	1-Pentene	109-67-1	2.20E-03		0.0022	Tons/Hot M		0.0022	Tons/Hot M		0.0022	Tons/Hot M		0.0022	Tons/Hot M	0.0022	Tons/Hot M	0.0022	Tons/Hot Mix Asphalt
	N-Hexane	110-54-3	9.20E-04		0.00092	Tons/Hot M		0.00092	Tons/Hot M		0.00092	Tons/Hot M		0.00092	Tons/Hot M	0.00092	Tons/Hot M	0.00092	Tons/Hot Mix Asphalt
	Valeraldeh	110-62-3	6.70E-05	---		---	---		---	---		---	---		---	0.000067	Tons/Hot M	0.000067	Tons/Hot Mix Asphalt
	Anthracen	120-12-7	3.10E-06		0.00000022	Tons/Hot M		0.00000022	Tons/Hot M		0.0000031	Tons/Hot M		0.0000031	Tons/Hot M	0.0000031	Tons/Hot M	0.0000031	Tons/Hot Mix Asphalt
	Propionald	123-38-6	1.30E-04	---		---	---		---	---		---	---		---	0.00013	Tons/Hot M	0.00013	Tons/Hot Mix Asphalt
	Butyraldeh	123-72-8	1.60E-04	---		---	---		---	---		---	---		---	0.00016	Tons/Hot M	0.00016	Tons/Hot Mix Asphalt
	Pyrene	129-00-0	3.00E-06		0.00000054	Tons/Hot M		0.00000054	Tons/Hot M		0.000003	Tons/Hot M		0.000003	Tons/Hot M	0.000003	Tons/Hot M	0.000003	Tons/Hot Mix Asphalt
	Isomers of	1330-20-7	2.00E-04		0.0002	Tons/Hot M		0.0002	Tons/Hot M		0.0002	Tons/Hot M		0.0002	Tons/Hot M	0.0002	Tons/Hot M	0.0002	Tons/Hot Mix Asphalt
	Heptane	142-82-5	9.40E-03		0.0094	Tons/Hot M		0.0094	Tons/Hot M		0.0094	Tons/Hot M		0.0094	Tons/Hot M	0.0094	Tons/Hot M	0.0094	Tons/Hot Mix Asphalt
	2,3,7,8-Tet	1746-01-6	2.10E-13	---		---	---		---		2.1E-13	Tons/Hot M		2.1E-13	Tons/Hot M	2.1E-13	Tons/Hot M	2.1E-13	Tons/Hot Mix Asphalt
	Chromium	18540-29-9	4.50E-07		0.00000045	Tons/Hot M		0.00000045	Tons/Hot M		0.00000045	Tons/Hot M		0.00000045	Tons/Hot M	0.00000045	Tons/Hot M	0.00000045	Tons/Hot Mix Asphalt
	Benzo (g,h,	191-24-2	4.00E-08		0.00000004	Tons/Hot M		0.00000004	Tons/Hot M		0.00000004	Tons/Hot M		0.00000004	Tons/Hot M	0.00000004	Tons/Hot M	0.00000004	Tons/Hot Mix Asphalt
	Benzo (e) p	192-97-2	1.10E-07		0.00000011	Tons/Hot M		0.00000011	Tons/Hot M		0.00000011	Tons/Hot M		0.00000011	Tons/Hot M	0.00000011	Tons/Hot M	0.00000011	Tons/Hot Mix Asphalt
	Indeno(1,2	193-39-5	7.00E-09		0.000000007	Tons/Hot M		0.000000007	Tons/Hot M		0.000000007	Tons/Hot M		0.000000007	Tons/Hot M	0.000000007	Tons/Hot M	0.000000007	Tons/Hot Mix Asphalt
	1,2,3,7,8,9-	19408-74-3	9.80E-13	---		---	---		---		9.8E-13	Tons/Hot M		9.8E-13	Tons/Hot M	9.8E-13	Tons/Hot M	9.8E-13	Tons/Hot Mix Asphalt
	Perylene	198-55-0	8.80E-09		8.8E-09	Tons/Hot M		8.8E-09	Tons/Hot M		8.8E-09	Tons/Hot M		8.8E-09	Tons/Hot M	8.8E-09	Tons/Hot M	8.8E-09	Tons/Hot Mix Asphalt
	Benzo (b) f	205-99-2	1.00E-07		0.0000001	Tons/Hot M		0.0000001	Tons/Hot M		0.0000001	Tons/Hot M		0.0000001	Tons/Hot M	0.0000001	Tons/Hot M	0.0000001	Tons/Hot Mix Asphalt
	Fluoranthe	206-44-0	6.10E-07		0.00000061	Tons/Hot M		0.00000061	Tons/Hot M		0.00000061	Tons/Hot M		0.00000061	Tons/Hot M	0.00000061	Tons/Hot M	0.00000061	Tons/Hot Mix Asphalt
	Benzo (k) fl	207-08-9	4.10E-08		0.000000041	Tons/Hot M		0.000000041	Tons/Hot M		0.000000041	Tons/Hot M		0.000000041	Tons/Hot M	0.000000041	Tons/Hot M	0.000000041	Tons/Hot Mix Asphalt
	Acenaphth	208-96-8	2.20E-05		0.0000086	Tons/Hot M		0.0000086	Tons/Hot M		0.000022	Tons/Hot M		0.000022	Tons/Hot M	0.000022	Tons/Hot M	0.000022	Tons/Hot Mix Asphalt
	Chrysene	218-01-9	1.80E-07		0.00000018	Tons/Hot M		0.00000018	Tons/Hot M		0.00000018	Tons/Hot M		0.00000018	Tons/Hot M	0.00000018	Tons/Hot M	0.00000018	Tons/Hot Mix Asphalt
	Octachloro	3268-87-9	2.70E-09	---		---	---		---		2.7E-09	Tons/Hot M		2.7E-09	Tons/Hot M	2.7E-09	Tons/Hot M	2.7E-09	Tons/Hot Mix Asphalt
	Hexachloro	34465-46-8	5.40E-12	---		---	---		---		5.4E-12	Tons/Hot M		5.4E-12	Tons/Hot M	5.4E-12	Tons/Hot M	5.4E-12	Tons/Hot Mix Asphalt
	1,2,3,4,6,7,	35822-46-9	3.40E-11	---		---	---		---		3.4E-11	Tons/Hot M		3.4E-11	Tons/Hot M	3.4E-11	Tons/Hot M	3.4E-11	Tons/Hot Mix Asphalt
	Octachloro	39001-02-0	4.80E-12	---		---	---		---		4.8E-12	Tons/Hot M		4.8E-12	Tons/Hot M	4.8E-12	Tons/Hot M	4.8E-12	Tons/Hot Mix Asphalt
	1,2,3,4,7,8-	39227-28-6	4.20E-13	---		---	---		---		4.2E-13	Tons/Hot M		4.2E-13	Tons/Hot M	4.2E-13	Tons/Hot M	4.2E-13	Tons/Hot Mix Asphalt
	1,2,3,7,8-P	40321-76-4	3.10E-13	---		---	---		---		3.1E-13	Tons/Hot M		3.1E-13	Tons/Hot M	3.1E-13	Tons/Hot M	3.1E-13	Tons/Hot Mix Asphalt
	2-Butenal	4170-30-3	8.60E-05	---		---	---		---	---		---	---		---	0.000086	Tons/Hot M	0.000086	Tons/Hot Mix Asphalt
	Formaldeh	50-00-0	3.10E-03		0.0031	Tons/Hot M		0.0031	Tons/Hot M		0.0031	Tons/Hot M		0.0031	Tons/Hot M	0.0031	Tons/Hot M	0.0031	Tons/Hot Mix Asphalt
	Benzo (a) p	50-32-8	9.80E-09		9.8E-09	Tons/Hot M		9.8E-09	Tons/Hot M		9.8E-09	Tons/Hot M		9.8E-09	Tons/Hot M	9.8E-09	Tons/Hot M	9.8E-09	Tons/Hot Mix Asphalt
	2,3,7,8-Tet	51207-31-9	9.70E-13	---		---	---		---		9.7E-13	Tons/Hot M		9.7E-13	Tons/Hot M	9.7E-13	Tons/Hot M	9.7E-13	Tons/Hot Mix Asphalt
	2-Methyl-2	513-35-9	5.80E-04		0.00058	Tons/Hot M		0.00058	Tons/Hot M		0.00058	Tons/Hot M		0.00058	Tons/Hot M	0.00058	Tons/Hot M	0.00058	Tons/Hot Mix Asphalt
	2,2,4-Trime	540-84-1	4.00E-05		0.00004	Tons/Hot M		0.00004	Tons/Hot M		0.00004	Tons/Hot M		0.00004	Tons/Hot M	0.00004	Tons/Hot M	0.00004	Tons/Hot Mix Asphalt
	1,2,3,4,7,8,	55673-89-7	2.70E-12	---		---	---		---		2.7E-12	Tons/Hot M		2.7E-12	Tons/Hot M	2.7E-12	Tons/Hot M	2.7E-12	Tons/Hot Mix Asphalt
	Benzo (a) a	56-55-3	2.10E-07		0.00000021	Tons/Hot M		0.00000021	Tons/Hot M		0.00000021	Tons/Hot M		0.00000021	Tons/Hot M	0.00000021	Tons/Hot M	0.00000021	Tons/Hot Mix Asphalt
	2,3,4,7,8-P	57117-31-4	8.40E-13	---		---	---		---		8.4E-13	Tons/Hot M		8.4E-13	Tons/Hot M	8.4E-13	Tons/Hot M	8.4E-13	Tons/Hot Mix Asphalt
	1,2,3,7,8-P	57117-41-6	4.30E-12	---		---	---		---		4.3E-12	Tons/Hot M		4.3E-12	Tons/Hot M	4.3E-12	Tons/Hot M	4.3E-12	Tons/Hot Mix Asphalt
	1,2,3,6,7,8-	57117-44-9	1.20E-12	---		---	---		---		1.2E-12	Tons/Hot M		1.2E-12	Tons/Hot M	1.2E-12	Tons/Hot M	1.2E-12	Tons/Hot Mix Asphalt
	1,2,3,6,7,8-	57653-85-7	1.30E-12	---		---	---		---		1.3E-12	Tons/Hot M		1.3E-12	Tons/Hot M	1.3E-12	Tons/Hot M	1.3E-12	Tons/Hot Mix Asphalt
	Isovalerald	590-86-3	3.20E-05	---		---	---		---	---		---	---		---	0.000032	Tons/Hot M	0.000032	Tons/Hot Mix Asphalt
	2,3,4,6,7,8-	60851-34-5	1.60E-12	---		---	---		---		1.6E-12	Tons/Hot M		1.6E-12	Tons/Hot M	1.6E-12	Tons/Hot M	1.6E-12	Tons/Hot Mix Asphalt
	Hexanal	66-25-1	1.10E-04	---		---	---		---	---		---	---		---	0.00011	Tons/Hot M	0.00011	Tons/Hot Mix Asphalt
	1,2,3,4,6,7,	67562-39-4	1.10E-11	---		---	---		---		1.1E-11	Tons/Hot M		1.1E-11	Tons/Hot M	1.1E-11	Tons/Hot M	1.1E-11	Tons/Hot Mix Asphalt
	Acetone	67-64-1	8.30E-04	---		---	---		---	---		---	---		---	0.00083	Tons/Hot M	0.00083	Tons/Hot Mix Asphalt
	1,2,3,4,7,8-	70648-26-9	5.40E-12	---		---	---		---		5.4E-12	Tons/Hot M		5.4E-12	Tons/Hot M	5.4E-12	Tons/Hot M	5.4E-12	Tons/Hot Mix Asphalt
	Benzene	71-43-2	3.90E-04		0.00039	Tons/Hot M		0.00039	Tons/Hot M		0.00039	Tons/Hot M		0.00039	Tons/Hot M	0.00039	Tons/Hot M	0.00039	Tons/Hot Mix Asphalt
	1,1,1-Trich	71-55-6	4.80E-05		0.000048	Tons/Hot M		0.000048	Tons/Hot M		0.000048	Tons/Hot M		0.000048	Tons/Hot M	0.000048	Tons/Hot M	0.000048	Tons/Hot Mix Asphalt
	1,2,3,7,8,9-	72918-21-9	8.40E-12	---		---	---		---		8.4E-12	Tons/Hot M		8.4E-12	Tons/Hot M	8.4E-12	Tons/Hot M	8.4E-12	Tons/Hot Mix Asphalt
	Manganese	7439-96-5	6.50E-04		7.70E-06	Tons/Hot M		0.0000077	Tons/Hot M		0.00065	Tons/Hot M		0.00065	Tons/Hot M	0.0000077	Tons/Hot M	0.0000077	Tons/Hot Mix Asphalt
	Mercury	7439-97-6	2.60E-07		0.00000024	Tons/Hot M		0.00000024	Tons/Hot M		0.00000026	Tons/Hot M		0.00000026	Tons/Hot M	0.00000026	Tons/Hot M	0.00000026	Tons/Hot Mix Asphalt
	Nickel	7440-02-0	1.30E-03		0.000063	Tons/Hot M		0.000063	Tons/Hot M		0.0013	Tons/Hot M		0.0013	Tons/Hot M	0.000063	Tons/Hot M	0.000063	Tons/Hot Mix Asphalt
	Silver	7440-22-4	4.80E-07		0.00000048	Tons/Hot M		0.00000048	Tons/Hot M		0.00000048	Tons/Hot M		0.00000048	Tons/Hot M	0.00000048	Tons/Hot M	0.00000048	Tons/Hot Mix Asphalt
	Thallium	7440-28-0	2.20E-06		4.1E-09	Tons/Hot M		4.1E-09	Tons/Hot M		0.0000022	Tons/Hot M		0.0000022	Tons/Hot M	4.1E-09	Tons/Hot M	4.1E-09	Tons/Hot Mix Asphalt
	Antimony	7440-36-0	1.80E-07		0.00000018	Tons/Hot M		0.00000018	Tons/Hot M		0.00000018	Tons/Hot M		0.00000018	Tons/Hot M	0.00000018	Tons/Hot M	0.00000018	Tons/Hot Mix Asphalt
	Arsenic	7440-38-2	1.30E-06		0.00000056	Tons/Hot M		0.00000056	Tons/Hot M		0.0000013	Tons/Hot M		0.0000013	Tons/Hot M	0.00000056	Tons/Hot M	0.00000056	Tons/Hot Mix Asphalt
	Barium	7440-39-3	2.50E-04		0.0000058	Tons/Hot M		0.0000058	Tons/Hot M		0.00025	Tons/Hot M		0.00025	Tons/Hot M	0.0000058	Tons/Hot M	0.0000058	Tons/Hot Mix Asphalt
	Beryllium	7440-41-7	0.00E+00		0	Tons/Hot M		0	Tons/Hot M		0	Tons/Hot M		0	Tons/Hot M	0	Tons/Hot M	0	Tons/Hot Mix Asphalt
	Cadmium	7440-43-9	4.20E-06		0.00000041	Tons/Hot M		0.00000041	Tons/Hot M		0.0000042	Tons/Hot M		0.0000042	Tons/Hot M	0.00000041	Tons/Hot M	0.00000041	Tons/Hot Mix Asphalt
	Chromium	7440-47-3	2.40E-05		0.0000055	Tons/Hot M		0.0000055	Tons/Hot M		0.000024	Tons/Hot M		0.000024	Tons/Hot M	0.0000055	Tons/Hot M	0.0000055	Tons/Hot Mix Asphalt
	Cobalt	7440-48-4	1.50E-05		0.000000026	Tons/Hot M		0.000000026	Tons/Hot M		0.000015	Tons/Hot M		0.000015	Tons/Hot M	0.000000026	Tons/Hot M	0.000000026	Tons/Hot Mix Asphalt
	Copper	7440-50-8	1.70E-04		0.0000031	Tons/Hot M		0.0000031	Tons/Hot M		0.00017	Tons/Hot M		0.00017	Tons/Hot M	0.0000031	Tons/Hot M	0.0000031	Tons/Hot Mix Asphalt
	Zinc	7440-66-6	1.80E-04		0.000061	Tons/Hot M		0.000061	Tons/Hot M		0.00018	Tons/Hot M		0.00018	Tons/Hot M	0.000061	Tons/Hot M	0.000061	Tons/Hot Mix Asphalt
	Ethylene	74-85-1	7.00E-03		0.007	Tons/Hot M		0.007	Tons/Hot M		0.007	Tons/Hot M		0.007	Tons/Hot M	0.007	Tons/Hot M	0.007	Tons/Hot Mix Asphalt
	Acetaldehy	75-07-0	1.30E-03	---		---	---		---	---		---	---		---	0.0013	Tons/Hot M	0.0013	Tons/Hot Mix Asphalt
	2-Methyl-1	763-29-1	4.00E-03		0.004	Tons/Hot M		0.004	Tons/Hot M		0.004	Tons/Hot M		0.004	Tons/Hot M	0.004	Tons/Hot M	0.004	Tons/Hot Mix Asphalt
#REF!	Hydrogen c	7647-01-0	2.10E-04	---		---	---		---	---		---	---		---	0.00021	Tons/Hot M	0.00021	Tons/Hot Mix Asphalt
	Phosphoru	7723-14-0	1.20E-03		0.000028	Tons/Hot M		0.000028	Tons/Hot M		0.0012	Tons/Hot M		0.0012	Tons/Hot M	0.000028	Tons/Hot M	0.000028	Tons/Hot Mix Asphalt
	Selenium	7782-49-2	2.40E-06		0.00000035	Tons/Hot M		0.00000035	Tons/Hot M		0.0000024	Tons/Hot M		0.0000024	Tons/Hot M	0.00000035	Tons/Hot M	0.00000035	Tons/Hot Mix Asphalt
	Methyl eth	78-93-3	2.00E-05	---		---	---		---	---		---	---		---	0.00002	Tons/Hot M	0.00002	Tons/Hot Mix Asphalt
	Acenaphth	83-32-9	1.40E-06		0.0000014	Tons/Hot M		0.0000014	Tons/Hot M		0.0000014	Tons/Hot M		0.0000014	Tons/Hot M	0.0000014	Tons/Hot M	0.0000014	Tons/Hot Mix Asphalt
	Phenanthr	85-01-8	2.30E-05		0.0000076	Tons/Hot M		0.0000076	Tons/Hot M		0.000023	Tons/Hot M		0.000023	Tons/Hot M	0.000023	Tons/Hot M	0.000023	Tons/Hot Mix Asphalt
	Fluorene	86-73-7	1.10E-05		0.0000038	Tons/Hot M		0.0000038	Tons/Hot M		0.000011	Tons/Hot M		0.000011	Tons/Hot M	0.000011	Tons/Hot M	0.000011	Tons/Hot Mix Asphalt
	Naphthale	91-20-3	6.50E-04		0.00009	Tons/Hot M		0.00009	Tons/Hot M		0.00065	Tons/Hot M		0.00065	Tons/Hot M	0.00065	Tons/Hot M	0.00065	Tons/Hot Mix Asphalt
	2-Methyl N	91-57-6	1.70E-04		0.000074	Tons/Hot M		0.000074	Tons/Hot M		0.00017	Tons/Hot M		0.00017	Tons/Hot M	0.00017	Tons/Hot M	0.00017	Tons/Hot Mix Asphalt
	3-Methylpe	96-14-0	1.90E-04		0.00019	Tons/Hot M		0.00019	Tons/Hot M		0.00019	Tons/Hot M		0.00019	Tons/Hot M	0.00019	Tons/Hot M	0.00019	Tons/Hot Mix Asphalt
	Heptachlorodibenzofu		3.80E-11	---		---	---		---		3.8E-11	Tons/Hot M		3.8E-11	Tons/Hot M	3.8E-11	Tons/Hot M	3.8E-11	Tons/Hot Mix Asphalt
	Heptachlorodibenzo-p		7.10E-11	---		---	---		---		7.1E-11	Tons/Hot M		7.1E-11	Tons/Hot M	7.1E-11	Tons/Hot M	7.1E-11	Tons/Hot Mix Asphalt
	Hexachlorodibenzofur		8.10E-12	---		---	---		---		8.1E-12	Tons/Hot M		8.1E-12	Tons/Hot M	8.1E-12	Tons/Hot M	8.1E-12	Tons/Hot Mix Asphalt
	Pentachlorodibenzofu		7.40E-11	---		---	---		---		7.4E-11	Tons/Hot M		7.4E-11	Tons/Hot M	7.4E-11	Tons/Hot M	7.4E-11	Tons/Hot Mix Asphalt
	Pentachlorodibenzo-p-		2.20E-11	---		---	---		---		2.2E-11	Tons/Hot M		2.2E-11	Tons/Hot M	2.2E-11	Tons/Hot M	2.2E-11	Tons/Hot Mix Asphalt
	Polychlorinated dibenz		1.50E-10	---		---	---		---		1.5E-10	Tons/Hot M		1.5E-10	Tons/Hot M	1.5E-10	Tons/Hot M	1.5E-10	Tons/Hot Mix Asphalt
	Polychlorinated dibenz		3.00E-09	---		---	---		---		0.000000003	Tons/Hot M		0.000000003	Tons/Hot M	0.000000003	Tons/Hot M	0.000000003	Tons/Hot Mix Asphalt
	Polychlorinated dibenz		2.80E-09	---		---	---		---		2.8E-09	Tons/Hot M		2.8E-09	Tons/Hot M	2.8E-09	Tons/Hot M	2.8E-09	Tons/Hot Mix Asphalt
	Tetrachlorodibenzofur		3.30E-11	---		---	---		---		3.3E-11	Tons/Hot M		3.3E-11	Tons/Hot M	3.3E-11	Tons/Hot M	3.3E-11	Tons/Hot Mix Asphalt
22.89987	Tetrachlorodibenzo-p-		9.30E-13	---		---	---		---		9.3E-13	Tons/Hot M		9.3E-13	Tons/Hot M	9.3E-13	Tons/Hot M	9.3E-13	Tons/Hot Mix Asphalt

[9]Emission factor is based on #6 Oil-Fired Counterflow Drum Mix HMA Plant (3-05-002-63): plus a Metal TAC safety factor of 4

[10]Hydrochloric Acid pph emissions based on 4000 ppm Halogen RUO. Assumes all Halogens are Cl and are converted to HCl with a 61% capture in process. Annual Emissions based on annual average 3450 ppm Halogen. See emission factor calculations.

Emission Calculation Methods

E_{ST} = Maximum Short Term HMA Production (ton HMA/hr) X EF

E_A = E_F X Annual Production Limit (ton HMA/yr) / 2,000 lb/ton

where:

E_{ST} = Short Term Emissions (lb/hr);

E_A = Annual Emissions (tpy);

EF = emission factor (lb/ton HMA)

Industrial Boiler < 10 MMBtu/hr

Table 4 - Miscellaneous Combustion Equipment - NSR Emissions

Air Permit to Install

Ajax Materials, Genesee Twp, Michigan

		AC Tank Heater
Heat Input Capacity	MMBtu/hr	2.0
Heat Input Capacity	MMcf/hr	1.96E-03
Annual Operating Hours	hr/yr	8,760
Annual Heat Input Limit or Capacity	MMBtu/yr	17,520
Fuel Heat Value	MMBtu/MMcf	1,020

WebFirename	NSR Regulated Pollutant	Emission Factor (See Notes)		Notes	Maximum Short Term Emissions per Unit (lb/hr)	Annual Emissions (tpy)
CO	CO	84	lb/MMCF	1	0.2	0.72
Nox	NO_X	100	lb/MMCF	1	0.2	0.86
PM10 F	PM	1.9	lb/MMCF	1	0.0	0.02
PM10	PM_{10}	7.6	lb/MMCF	1	0.0	0.07
PM2.5	$PM_{2.5}$	7.6	lb/MMCF	1	0.0	0.07
SO2	SO_2	0.6	lb/MMCF	1	0.0	0.01
VOC	VOC	5.5	lb/MMCF	1	0.0	0.05
CO2	CO_2	53.1	kg/MMBtu	2	234	1024.72
CH4	CH_4	1.0E-03	kg/MMBtu	2	0.0	0.02
N2O	N_2O	1.0E-04	kg/MMBtu	2	0.0	0.00
CO2	CO_2e	53.1	kg/MMBtu	2	234	1025.78
	Lead	5.0E-04	lb/MMCF	3	9.80E-07	4.29E-06

[1] Emission factors are from Web-fire for SCC 1-02-006-03 for a Boiler with a heat input capacity of less than 10 MMBtu/hr.

[2] CO_2e global warming potential and emission factors obtained from 40 CFR 98 Subparts A and C, respectively. The global warming potential for CH_4 (25) and N_2O (298) are consistent with the USEPA published changes on November 29, 2013.

[3] Emission factors are from Web-fire for SCC 1-02-006-02 for a Boiler with a heat input capacity of greater than 10

Emission Calculation Methods *where:*

Using lb/MMCF Emission Factors

$E_{ST} = C_{MMCF} \times EF_{MMCF}$

Using kg/MMBtu Emission Factors

$E_{ST} = C_{HI} \times 2.20462\ lb/kg \times EF_{ka}$

$E_A = E_{ST} \times$ *Annual Operating Hours / 2,000 lb/ton*

E_{ST} = Short Term Emissions (lb/hr);
E_A = Annual Maximum Emissions (tpy);
C_{MMCF} = Max Fuel Usage (MMCF/hr); and
EF_{MMCF} = emission factor (lb/MMCF)
C_{HI} = Heat Input Capacity (MMBtu/hr); and
EF_{ka} = emission factor (kg/MMBtu)

Table C-1 to Subpart C of Part 98—Default CO_2 Emission Factors and High Heat Values for Various Types of Fuel

Default CO_2 **Emission Factors and High Heat Values for Various Types of Fuel**

Fuel type	**Default high heat value**	**Default CO_2 emission factor**
Natural gas	1.026×10^{-3}	53.06

Table C-2 to Subpart C of Part 98—Default CH_4 and N_2O Emission

Fuel type	**Default CH_4 emission factor ($kg\ CH_4$/mmBtu)**	**N_2O emission**
Natural Gas	1.00E-03	1.00E-04

DATE	INITIALS	NOTES
		Initial Spreadsheet completed
		Initial QC
		Use rows for follow-up changes and QCs

WF EF	Units	FACTORID	SCC	SCCID	LEVEL1	LEVEL2	LEVEL3	LEVEL4	NEI_POLLU	CAS	POLLUTAN	POLLUTAN	CONTROLC	CONTROLI	CONTROL	Primary	FACTOR	UNIT	MEASURE	MATERIAL	ACTION	FORMULA	AP42SECTI	NOTES	REF_DESC	QUALITY	NUMSOUF	Created	REVOKED	Dupcount	Dupreason
84	Lb/Million Cubic Feet	5935	10200603	125	External Cor	Industrial	Natural Ga	< 10 Millio	CO	630-08-0	Carbon m	137	0	129	UNCONTR	1	8.40E+01	Lb	Million Cu	Natural Ga	Burned		1.4		EPA. Marc	B	0	00:00.0		0	
100	Lb/Million Cubic Feet	5936	10200603	125	External Cor	Industrial	Natural Ga	< 10 Millio	NOX		Nitrogen c	303	0	129	UNCONTR	1	1.00E+02	Lb	Million Cu	Natural Ga	Burned		1.4	Emission f	EPA. Marc	A	0			0	
1.9	Lb/Million Cubic Feet	5938	10200603	125	External Cor	Industrial	Natural Ga	< 10 Millio	PM-FIL		PM, filtera	334	0	129	UNCONTR	1	1.90E+00	Lb	Million Cu	Natural Ga	Burned		1.4	All PM (tot	EPA. Marc	B	0	00:00.0		0	
7.6	Lb/Million Cubic Feet	5943	10200603	125	External Cor	Industrial	Natural Ga	< 10 Millio	PM10-PRI		PM10, pri	339	0	129	UNCONTR	1	7.60E+00	Lb	Million Cu	Natural Ga	Burned			Sum of PM	This emiss	D	0	00:00.0		0	
7.6	Lb/Million Cubic Feet	5945	10200603	125	External Cor	Industrial	Natural Ga	< 10 Millio	PM25-PRI		PM2.5, pri	341	0	129	UNCONTR	1	7.60E+00	Lb	Million Cu	Natural Ga	Burned			Sum of PM	This emiss	D	0	00:00.0		0	
0.6	Lb/Million Cubic Feet	5946	10200603	125	External Cor	Industrial	Natural Ga	< 10 Million Btu/hr			Sulfur oxi	381	0	129	UNCONTR	1	6.00E-01	Lb	Million Cu	Natural Ga	Burned		1.4		EPA. Octo	A	0			0	
5.5	Lb/Million Cubic Feet	5949	10200603	125	External Cor	Industrial	Natural Ga	< 10 Millio	VOC		Volatile or	417	0	129	UNCONTR	1	5.50E+00	Lb	Million Cu	Natural Ga	Burned		1.4		EPA. Marc	C	0	00:00.0		0	
5.00E-04	Lb/Million Cubic Feet	5908	10200602	124	External Cor	Industrial	Natural Ga	10-100 Mil	7439921	7439-92-1	Lead	250	0	129	UNCONTR	1	5.00E-04	Lb	Million Cu	Natural Ga	Burned		1.4	Hazardous	EPA. Marc	D	0	00:00.0		0	

Industrial Boiler < 10 MMBtu/hr

Table 5 - Miscellaneous Combustion Equipment - TAC Emissions

Air Permit to Install

Ajax Materials, Genesee Twp, Michigan

Copy Column G & insert between Columns G & H for multiple units with Varying Capacity

DATE	INITIALS	NOTES
		Initial Spreadsheet completed
		Initial QC
		Use rows for follow-up changes and QCs

		AC Tank Heater
Heat Input Capacity	MMBtu/hr	2.0
Heat Input Capacity	MMcf/hr	1.96E-03
Annual Operating Hours	hr/yr	8,760
Annual Heat Input Limit or Capacity	MMBtu/yr	17,520
Fuel Heat Value	MMBtu/MMcf	1,020

CAS No hyphens	Toxic Air Contaminant	CAS No.	Emission Factor (See Notes)		Notes	Maximum Short Term Emissions per Unit (lb/hr)	Annual Emissions (tpy)	HAP?
50000	Formaldehyde	50-00-0	7.50E-02	lb/MMCF	1	1.47E-04	6.44E-04	Yes
50328	Benzo (a) pyrene	50-32-8	1.20E-06	lb/MMCF	1	2.35E-09	1.03E-08	Yes
53703	Dibenzo(a,h) anthracene	53-70-3	1.20E-06	lb/MMCF	1	2.35E-09	1.03E-08	Yes
56495	3-Methylcholanthrene	56-49-5	1.80E-06	lb/MMCF	1	3.53E-09	1.55E-08	Yes
56553	Benzo (a) anthracene	56-55-3	1.80E-06	lb/MMCF	1	3.53E-09	1.55E-08	Yes
57976	Dimethylbenz(a)anthracene	57-97-6	1.60E-05	lb/MMCF	1	3.14E-08	1.37E-07	Yes
71432	Benzene	71-43-2	2.10E-03	lb/MMCF	1	4.12E-06	1.80E-05	Yes
83329	Acenaphthene	83-32-9	1.80E-06	lb/MMCF	1	3.53E-09	1.55E-08	Yes
85018	Phenanthrene	85-01-8	1.70E-05	lb/MMCF	1	3.33E-08	1.46E-07	Yes
86737	Fluorene	86-73-7	2.80E-06	lb/MMCF	1	5.49E-09	2.40E-08	Yes
91203	Naphthalene	91-20-3	6.10E-04	lb/MMCF	1	1.20E-06	5.24E-06	Yes
91576	2-Methyl Naphthalene	91-57-6	2.40E-05	lb/MMCF	1	4.71E-08	2.06E-07	Yes
108883	Toluene	108-88-3	3.40E-03	lb/MMCF	1	6.67E-06	2.92E-05	Yes
110543	N-Hexane	110-54-3	1.80E+00	lb/MMCF	1	3.53E-03	1.55E-02	Yes
120127	Anthracene	120-12-7	2.40E-06	lb/MMCF	1	4.71E-09	2.06E-08	Yes
129000	Pyrene	129-00-0	5.00E-06	lb/MMCF	1	9.80E-09	4.29E-08	Yes
191242	Benzo (g,h,i) perylene	191-24-2	1.20E-06	lb/MMCF	1	2.35E-09	1.03E-08	Yes
193395	Indeno(1,2,3-cd)pyrene	193-39-5	1.80E-06	lb/MMCF	1	3.53E-09	1.55E-08	Yes
205992	Benzo (b) fluoranthene	205-99-2	1.80E-06	lb/MMCF	1	3.53E-09	1.55E-08	Yes
206440	Fluoranthene	206-44-0	3.00E-06	lb/MMCF	1	5.88E-09	2.58E-08	Yes
207089	Benzo (k) fluoranthene	207-08-9	1.80E-06	lb/MMCF	1	3.53E-09	1.55E-08	Yes
208968	Acenaphthylene	208-96-8	1.80E-06	lb/MMCF	1	3.53E-09	1.55E-08	Yes
218019	Chrysene	218-01-9	1.80E-06	lb/MMCF	1	3.53E-09	1.55E-08	Yes
7439965	Manganese	7439-96-5	3.80E-04	lb/MMCF	1	7.45E-07	3.26E-06	Yes
7439976	Mercury	7439-97-6	2.60E-04	lb/MMCF	1	5.10E-07	2.23E-06	Yes
7439987	Molybdenum	7439-98-7	1.10E-03	lb/MMCF	1	2.16E-06	9.45E-06	No
7440020	Nickel	7440-02-0	2.10E-03	lb/MMCF	1	4.12E-06	1.80E-05	Yes
7440382	Arsenic	7440-38-2	2.00E-04	lb/MMCF	1	3.92E-07	1.72E-06	Yes
7440393	Barium	7440-39-3	4.40E-03	lb/MMCF	1	8.63E-06	3.78E-05	No
7440417	Beryllium	7440-41-7	1.20E-05	lb/MMCF	1	2.35E-08	1.03E-07	Yes
7440439	Cadmium	7440-43-9	1.10E-03	lb/MMCF	1	2.16E-06	9.45E-06	Yes
7440473	Chromium	7440-47-3	1.40E-03	lb/MMCF	1	2.75E-06	1.20E-05	Yes
7440484	Cobalt	7440-48-4	8.40E-05	lb/MMCF	1	1.65E-07	7.21E-07	Yes
7440508	Copper	7440-50-8	8.50E-04	lb/MMCF	1	1.67E-06	7.30E-06	No
7440622	Vanadium	7440-62-2	2.30E-03	lb/MMCF	1	4.51E-06	1.98E-05	No
7440666	Zinc	7440-66-6	2.90E-02	lb/MMCF	1	5.69E-05	2.49E-04	No
7664417	Ammonia	7664-41-7	3.20E+00	lb/MMCF	1	6.27E-03	2.75E-02	No
7782492	Selenium	7782-49-2	2.40E-05	lb/MMCF	1	4.71E-08	2.06E-07	Yes
25321226	Dichlorobenzene, mixed isomers	25321-22-6	1.20E-03	lb/MMCF	1	2.35E-06	1.03E-05	No
					Aggregate HAPs	**3.70E-03**	**1.62E-02**	

[1] Emission factors are from Web-fire for SCC 1-02-006-02 because no TAC factors are available for SCC 1-02-006-03.

Emission Calculation Methods

Using lb/MMCF Emission Factors

$E_{ST} = C_{MMCF} \times EF_{MMCF}$

$E_A = E_{ST} \times$ Annual Operating Hours / 2,000 lb/ton

where:

E_{ST} = Short Term Emissions (lb/hr);

E_A = Annual Maximum Emissions (tpy);

C_{MMCF} = Max Fuel Usage (MMCF/hr); and

EF_{MMCF} = emission factor (lb/MMCF)

		WF EF	Units	FACTORID	SCC	SCCID	LEVEL1	LEVEL2	LEVEL3	LEVEL4	NEI_POLLU	CAS	POLLUTAN	POLLUTAN	CONTROLC	CONTROLII	CONTROL	Primary	FACTOR	UNIT	MEASURE	MATERIAL	ACTION	FORMULA	AP42SECTI	NOTES	REF_DESC	QUALITY	NUMSOUR	Created	REVOKED	Dupcount	Dupreason
		7.50E-02	Lb/Million Cubic Feet	50000	5906	10200602	124	External Cc	Industrial	Natural Ga	10-100 Mi	50000	50-00-0	Formaldeh	210	0	129	UNCONTR	1	7.50E-02	Lb	Million Cul	Natural Ga	Burned		1.4	Hazardous	EPA. Marc	B	0	00:00.0		0
		1.20E-06	Lb/Million Cubic Feet	50328	5881	10200602	124	External Cc	Industrial	Natural Ga	10-100 Mi	50328	50-32-8	Benzo (a) p	103	0	129	UNCONTR	1	<1.200E-6	Lb	Million Cul	Natural Ga	Burned		1.4	Hazardous	EPA. Marc	E	0	00:00.0		0
		1.20E-06	Lb/Million Cubic Feet	53703	5900	10200602	124	External Cc	Industrial	Natural Ga	10-100 Mi	53703	53-70-3	Dibenzo(a,	166	0	129	UNCONTR	1	<1.200E-6	Lb	Million Cul	Natural Ga	Burned		1.4	Hazardous	EPA. Marc	E	0	00:00.0		0
		1.80E-06	Lb/Million Cubic Feet	56495	5913	10200602	124	External Cc	Industrial	Natural Ga	10-100 Mi	56495	56-49-5	3-Methylcl	61	0	129	UNCONTR	1	<1.800E-6	Lb	Million Cul	Natural Ga	Burned		1.4	Hazardous	EPA. Marc	E	0	00:00.0		0
		1.80E-06	Lb/Million Cubic Feet	56553	5880	10200602	124	External Cc	Industrial	Natural Ga	10-100 Mi	56553	56-55-3	Benzo (a) a	102	0	129	UNCONTR	1	<1.800E-6	Lb	Million Cul	Natural Ga	Burned		1.4	Hazardous	EPA. Marc	E	0	00:00.0		0
		1.60E-05	Lb/Million Cubic Feet	57976	5902	10200602	124	External Cc	Industrial	Natural Ga	10-100 Mi	57976	57-97-6	Dimethylb	181	0	129	UNCONTR	1	<1.600E-5	Lb	Million Cul	Natural Ga	Burned		1.4	Hazardous	EPA. Marc	E	0	00:00.0		0
		2.10E-03	Lb/Million Cubic Feet	71432	5879	10200602	124	External Cc	Industrial	Natural Ga	10-100 Mi	71432	71-43-2	Benzene	98	0	129	UNCONTR	1	2.10E-03	Lb	Million Cul	Natural Ga	Burned		1.4	Hazardous	EPA. Marc	B	0	00:00.0		0
		1.80E-06	Lb/Million Cubic Feet	83329	5871	10200602	124	External Cc	Industrial	Natural Ga	10-100 Mi	83329	83-32-9	Acenaphth	69	0	129	UNCONTR	1	<1.800E-6	Lb	Million Cul	Natural Ga	Burned		1.4	Hazardous	EPA. Marc	E	0	00:00.0		0
		1.70E-05	Lb/Million Cubic Feet	85018	5916	10200602	124	External Cc	Industrial	Natural Ga	10-100 Mi	85018	85-01-8	Phenanthr	325	0	129	UNCONTR	1	1.70E-05	Lb	Million Cul	Natural Ga	Burned		1.4	Hazardous	EPA. Marc	D	0	00:00.0		0
		2.80E-06	Lb/Million Cubic Feet	86737	5905	10200602	124	External Cc	Industrial	Natural Ga	10-100 Mi	86737	86-73-7	Fluorene	205	0	129	UNCONTR	1	2.80E-06	Lb	Million Cul	Natural Ga	Burned		1.4	Hazardous	EPA. Marc	E	0	00:00.0		0
		6.10E-04	Lb/Million Cubic Feet	91203	4529	10200602	124	External Cc	Industrial	Natural Ga	10-100 Mi	91203	91-20-3	Naphthale	291	0	129	UNCONTR	1	6.10E-04	Lb	Million Cul	Natural Ga	Burned		1.4	Hazardous	EPA. Marc	E	0	00:00.0		0
		2.40E-05	Lb/Million Cubic Feet	91576	5912	10200602	124	External Cc	Industrial	Natural Ga	10-100 Mi	91576	91-57-6	2-Methyl N	55	0	129	UNCONTR	1	2.40E-05	Lb	Million Cul	Natural Ga	Burned		1.4	Hazardous	EPA. Marc	D	0	00:00.0		0
		3.40E-03	Lb/Million Cubic Feet	108883	3357	10200602	124	External Cc	Industrial	Natural Ga	10-100 Mi	108883	108-88-3	Toluene	397	0	129	UNCONTR	1	3.40E-03	Lb	Million Cul	Natural Ga	Burned		1.4	Hazardous	EPA. Marc	C	0	00:00.0		0
		1.80E+00	Lb/Million Cubic Feet	110543	4527	10200602	124	External Cc	Industrial	Natural Ga	10-100 Mi	110543	110-54-3	N-Hexane	295	0	129	UNCONTR	1	1.80E+00	Lb	Million Cul	Natural Ga	Burned		1.4	Hazardous	EPA. Marc	E	0	00:00.0		0
		2.40E-06	Lb/Million Cubic Feet	120127	5876	10200602	124	External Cc	Industrial	Natural Ga	10-100 Mi	120127	120-12-7	Anthracen	91	0	129	UNCONTR	1	<2.400E-6	Lb	Million Cul	Natural Ga	Burned		1.4	Hazardous	EPA. Marc	E	0	00:00.0		0
		5.00E-06	Lb/Million Cubic Feet	129000	3351	10200602	124	External Cc	Industrial	Natural Ga	10-100 Mi	129000	129-00-0	Pyrene	360	0	129	UNCONTR	1	5.00E-06	Lb	Million Cul	Natural Ga	Burned		1.4	Hazardous	EPA. Marc	E	0	00:00.0		0
		1.20E-06	Lb/Million Cubic Feet	191242	5883	10200602	124	External Cc	Industrial	Natural Ga	10-100 Mi	191242	191-24-2	Benzo (g,h	106	0	129	UNCONTR	1	<1.200E-6	Lb	Million Cul	Natural Ga	Burned		1.4	Hazardous	EPA. Marc	E	0	00:00.0		0
		1.80E-06	Lb/Million Cubic Feet	193395	5907	10200602	124	External Cc	Industrial	Natural Ga	10-100 Mi	193395	193-39-5	Indeno(1,2	237	0	129	UNCONTR	1	<1.800E-6	Lb	Million Cul	Natural Ga	Burned		1.4	Hazardous	EPA. Marc	E	0	00:00.0		0
		1.80E-06	Lb/Million Cubic Feet	205992	5882	10200602	124	External Cc	Industrial	Natural Ga	10-100 Mi	205992	205-99-2	Benzo (b) f	104	0	129	UNCONTR	1	<1.800E-6	Lb	Million Cul	Natural Ga	Burned		1.4	Hazardous	EPA. Marc	E	0	00:00.0		0
		3.00E-06	Lb/Million Cubic Feet	206440	5904	10200602	124	External Cc	Industrial	Natural Ga	10-100 Mi	206440	206-44-0	Fluoranthe	204	0	129	UNCONTR	1	3.00E-06	Lb	Million Cul	Natural Ga	Burned		1.4	Hazardous	EPA. Marc	E	0	00:00.0		0
		1.80E-06	Lb/Million Cubic Feet	207089	5884	10200602	124	External Cc	Industrial	Natural Ga	10-100 Mi	207089	207-08-9	Benzo (k) f	107	0	129	UNCONTR	1	<1.800E-6	Lb	Million Cul	Natural Ga	Burned		1.4	Hazardous	EPA. Marc	E	0	00:00.0		0
		1.80E-06	Lb/Million Cubic Feet	208968	5872	10200602	124	External Cc	Industrial	Natural Ga	10-100 Mi	208968	208-96-8	Acenaphth	70	0	129	UNCONTR	1	<1.800E-6	Lb	Million Cul	Natural Ga	Burned		1.4	Hazardous	EPA. Marc	E	0	00:00.0		0
		1.80E-06	Lb/Million Cubic Feet	218019	5897	10200602	124	External Cc	Industrial	Natural Ga	10-100 Mi	218019	218-01-9	Chrysene	153	0	129	UNCONTR	1	<1.800E-6	Lb	Million Cul	Natural Ga	Burned		1.4	Hazardous	EPA. Marc	E	0	00:00.0		0
		3.80E-04	Lb/Million Cubic Feet	7439965	5909	10200602	124	External Cc	Industrial	Natural Ga	10-100 Mi	7439965	7439-96-5	Manganes	257	0	129	UNCONTR	1	3.80E-04	Lb	Million Cul	Natural Ga	Burned		1.4	Hazardous	EPA. Marc	D	0	00:00.0		0
		2.60E-04	Lb/Million Cubic Feet	7439976	5910	10200602	124	External Cc	Industrial	Natural Ga	10-100 Mi	7439976	7439-97-6	Mercury	260	0	129	UNCONTR	1	2.60E-04	Lb	Million Cul	Natural Ga	Burned		1.4	Hazardous	EPA. Marc	D	0	00:00.0		0
		1.10E-03	Lb/Million Cubic Feet	7439987	5914	10200602	124	External Cc	Industrial	Natural Ga	10-100 Million Btu/hr		7439-98-7	Molybdenu	287	0	129	UNCONTR	1	1.10E-03	Lb	Million Cul	Natural Ga	Burned		1.4		EPA. Marc	D	0	00:00.0		0
		2.10E-03	Lb/Million Cubic Feet	7440020	4530	10200602	124	External Cc	Industrial	Natural Ga	10-100 Mi	7440020	7440-02-0	Nickel	296	0	129	UNCONTR	1	2.10E-03	Lb	Million Cul	Natural Ga	Burned		1.4	Hazardous	EPA. Marc	C	0	00:00.0		0
		2.00E-04	Lb/Million Cubic Feet	7440382	5877	10200602	124	External Cc	Industrial	Natural Ga	10-100 Mi	7440382	7440-38-2	Arsenic	93	0	129	UNCONTR	1	2.00E-04	Lb	Million Cul	Natural Ga	Burned		1.4	Hazardous	EPA. Marc	E	0	00:00.0		0
		4.40E-03	Lb/Million Cubic Feet	7440393	5878	10200602	124	External Cc	Industrial	Natural Ga	10-100 Million Btu/hr		7440-39-3	Barium	96	0	129	UNCONTR	1	4.40E-03	Lb	Million Cul	Natural Ga	Burned		1.4		EPA. Marc	D	0	00:00.0		0
		1.20E-05	Lb/Million Cubic Feet	7440417	5885	10200602	124	External Cc	Industrial	Natural Ga	10-100 Mi	7440417	7440-41-7	Beryllium	119	0	129	UNCONTR	1	<1.200E-5	Lb	Million Cul	Natural Ga	Burned		1.4	Hazardous	EPA. Marc	E	0	00:00.0		0
		1.10E-03	Lb/Million Cubic Feet	7440439	5887	10200602	124	External Cc	Industrial	Natural Ga	10-100 Mi	7440439	7440-43-9	Cadmium	130	0	129	UNCONTR	1	1.10E-03	Lb	Million Cul	Natural Ga	Burned		1.4	Hazardous	EPA. Marc	D	0	00:00.0		0
		1.40E-03	Lb/Million Cubic Feet	7440473	5896	10200602	124	External Cc	Industrial	Natural Ga	10-100 Mi	7440473	7440-47-3	Chromium	149	0	129	UNCONTR	1	1.40E-03	Lb	Million Cul	Natural Ga	Burned		1.4	Hazardous	EPA. Marc	D	0	00:00.0		0
		8.40E-05	Lb/Million Cubic Feet	7440484	5898	10200602	124	External Cc	Industrial	Natural Ga	10-100 Mi	7440484	7440-48-4	Cobalt	154	0	129	UNCONTR	1	8.40E-05	Lb	Million Cul	Natural Ga	Burned		1.4	Hazardous	EPA. Marc	D	0	00:00.0		0
		8.50E-04	Lb/Million Cubic Feet	7440508	5899	10200602	124	External Cc	Industrial	Natural Ga	10-100 Million Btu/hr		7440-50-8	Copper	156	0	129	UNCONTR	1	8.50E-04	Lb	Million Cul	Natural Ga	Burned		1.4		EPA. Marc	C	0	00:00.0		0
		2.30E-03	Lb/Million Cubic Feet	7440622	5927	10200602	124	External Cc	Industrial	Natural Ga	10-100 Million Btu/hr		7440-62-2	Vanadium	413	0	129	UNCONTR	1	2.30E-03	Lb	Million Cul	Natural Ga	Burned		1.4		EPA. Marc	D	0	00:00.0		0
		2.90E-02	Lb/Million Cubic Feet	7440666	5930	10200602	124	External Cc	Industrial	Natural Ga	10-100 Million Btu/hr		7440-66-6	Zinc	419	0	129	UNCONTR	1	2.90E-02	Lb	Million Cul	Natural Ga	Burned		1.4		EPA. Marc	E	0	00:00.0		0
		3.20E+00	Lb/Million Cubic Feet	7664417	5873	10200602	124	External Cc	Industrial	Natural Ga	10-100 Mi	NH3	7664-41-7	Ammonia	87	0	129	UNCONTR	1	3.20E+00	Lb	Million Cul	Natural Ga	Burned				Developme	C	0	00:00.0		0
		2.40E-05	Lb/Million Cubic Feet	7782492	3352	10200602	124	External Cc	Industrial	Natural Ga	10-100 Mi	7782492	7782-49-2	Selenium	370	0	129	UNCONTR	1	<2.400E-5	Lb	Million Cul	Natural Ga	Burned		1.4	Hazardous	EPA. Marc	E	0	00:00.0		0
0.015459	Formaldel	1.20E-03	Lb/Million Cubic Feet	25321226	5901	10200602	124	External Cc	Industrial	Natural Ga	10-100 Million Btu/hr		25321-22-	Dichlorobe	169	0	129	UNCONTR	1	1.20E-03	Lb	Million Cul	Natural Ga	Burned		1.4	Hazardous	EPA. Marc	E	0	00:00.0		0

Table 5.1 - Proposed Silo Load-Out NSR Regulated Pollutant Estimated Emissions

Air Permit to Install Application

Ajax Materials, Genesee Twp, Michigan

Maximum Short Term Production	tons HMA/hr	600
Daily Average Production	tons HMA/hr	500
Annual Production Limit	tons HMA/yr	876,322
Temperature	F	325
Asphalt Volatility Factor		-0.5

WebFirename	NSR Regulated Pollutant	Emission Factor (See Notes)		Notes	Maximum Short Term Emissions (lb/hr)	Annual Emissions (tpy)
CO	CO	1.35E-03	lb/ton HMA	1	0.8	0.6
Nox	NO_X					
PM10 F	PM	5.22E-04	lb/ton HMA	1	0.3	0.2
PM10	PM_{10}	8.63E-04	lb/ton HMA	1,2	0.4	0.4
PM2.5	$PM_{2.5}$	8.63E-04	lb/ton HMA	1,2	0.4	0.4
SO2	SO_2					
VOC	VOC	3.91E-03	lb/ton HMA	1	2.3	1.7

[1] Emission factors are from AP-42 Table 11.1-14 for SCC 3-05-002-14 for Truck Load-out Emissions

[2]lb/hr emission rates based on daily average production

Emission Calculation Methods

E_{ST} = Maximum Short Term HMA Production (ton HMA/hr) X EF

E_A = E_F X Annual Production Limit (ton HMA/yr) / 2,000 lb/ton

where:

E_{ST} = Short Term Emissions (lb/hr);

E_A = Annual Emissions (tpy);

EF = emission factor (lb/ton HMA)

CO_2e

CO_2e (lb/hr) = CO_2 (lb/hr) x 1 + CH_4 (lb/hr) x 25 + N_2O (lb/hr) x 298

WebFirename	WF EF	Units	FACTORID	SCC	SCCID	LEVEL1	LEVEL2	LEVEL3	LEVEL4	NEI	POLLI	CAS	POLLUTAN	POLLUTAN	CONTROL	CONTROL	CONTROL
CO	1.30E-03	Lb/Tons	16569	3.1E+07	5484	Industrial Pr	Mineral Pr	Asphalt Cc	Truck Loa	CO		630-08-0	Carbon m	137	0	129	UNCONTROLLED
Nox																	
PM10 F																	
PM10	#VALUE!	/															
PM2.5	#VALUE!	/															
SO2	#VALUE!	/															
VOC	3.90E-03	Lb/Tons	16605	3.1E+07	5484	Industrial Pr	Mineral Pr	Asphalt Cc	Truck Loa	VOC			Volatile or	417	0	129	UNCONTROLLED

WebFirename	Primary	FACTOR	UNIT	MEASURE	MATERIAL	ACTION	FORMULA	AP42SECT	NOTES	REF	DESC	QUALITY	NUMSOU	Created	REVOKED	Dupcount	Dupreason
CO		1.30E-03	Lb	Tons	Material	Loaded		11.1	Calculated	EPA.	200(	E	0	00:00.0		0	
Nox																	
PM10 F																	
PM10																	
PM2.5																	
SO2																	
VOC		3.90E-03	Lb	Tons	Material	Loaded		11.1	This factor	EPA.	200(	E	0	36861		0	

Table 5.2 - Proposed Proposed Silo Load-Out TAC Emissions

Air Permit to Install Application

Ajax Materials, Genesee Twp, Michigan

Maximum Short Term Production	tons HMA/hr	600
Annual Production Limit	tons HMA/yr	876,322
Organic PM	lb/ton	3.41E-04
TOC	lb/ton	4.16E-03

CAS No hyphens	Toxic Air Contaminant	CAS No.	Emission Factor (See Notes)		Notes	Maximum Short Term Emissions (lb/hr)	Annual Emissions (tpy)	HAP?
83329	Acenaphthene	83-32-9	8.86E-07	lb/ton HMA	1	5.32E-04	3.88E-04	Yes
208968	Acenaphthylene	208-96-8	9.55E-08	lb/ton HMA	1	5.73E-05	4.18E-05	Yes
120127	Anthracene	120-12-7	2.39E-07	lb/ton HMA	1	1.43E-04	1.05E-04	Yes
56553	Benzo (a) anthracene	56-55-3	6.48E-08	lb/ton HMA	1	3.89E-05	2.84E-05	Yes
205992	Benzo (b) fluoranthene	205-99-2	2.59E-08	lb/ton HMA	1	1.55E-05	1.14E-05	Yes
207089	Benzo (k) fluoranthene	207-08-9	7.50E-09	lb/ton HMA	1	4.50E-06	3.29E-06	Yes
191242	Benzo (g,h,i) perylene	191-24-2	6.48E-09	lb/ton HMA	1	3.89E-06	2.84E-06	Yes
50328	Benzo (a) pyrene	50-32-8	7.84E-09	lb/ton HMA	1	4.70E-06	3.44E-06	Yes
192972	Benzo (e) pyrene	192-97-2	2.66E-08	lb/ton HMA	1	1.60E-05	1.17E-05	Yes
218019	Chrysene	218-01-9	3.51E-07	lb/ton HMA	1	2.11E-04	1.54E-04	Yes
53703	Dibenzo(a,h) anthracene	53-70-3	1.26E-09	lb/ton HMA	1	7.57E-07	5.53E-07	Yes
206440	Fluoranthene	206-44-0	1.70E-07	lb/ton HMA	1	1.02E-04	7.47E-05	Yes
86737	Fluorene	86-73-7	2.63E-06	lb/ton HMA	1	1.58E-03	1.15E-03	Yes
193395	Indeno(1,2,3-cd)pyrene	193-39-5	1.60E-09	lb/ton HMA	1	9.61E-07	7.02E-07	Yes
91576	2-Methyl Naphthalene	91-57-6	8.11E-06	lb/ton HMA	1	4.87E-03	3.56E-03	Yes
91203	Naphthalene	91-20-3	4.26E-06	lb/ton HMA	1	2.56E-03	1.87E-03	Yes
198550	Perylene	198-55-0	7.50E-08	lb/ton HMA	1	4.50E-05	3.29E-05	Yes
85018	Phenanthrene	85-01-8	2.76E-06	lb/ton HMA	1	1.66E-03	1.21E-03	Yes
129000	Pyrene	129-00-0	5.11E-07	lb/ton HMA	1	3.07E-04	2.24E-04	Yes
108952	Phenol	108-95-2	4.02E-06	lb/ton HMA	1	2.41E-03	1.76E-03	Yes
67641	Acetone	67-64-1	1.91E-06	lb/ton HMA	1	1.15E-03	8.38E-04	No
74851	Ethylene	74-85-1	2.95E-05	lb/ton HMA	1	1.77E-02	1.29E-02	No
71432	Benzene	71-43-2	2.16E-06	lb/ton HMA	1	1.30E-03	9.48E-04	Yes
74839	Methyl bromide	74-83-9	3.99E-07	lb/ton HMA	1	2.40E-04	1.75E-04	Yes
78933	Methyl ethyl ketone	78-93-3	2.04E-06	lb/ton HMA	1	1.22E-03	8.93E-04	Yes
75150	Carbon sulfide	75-15-0	5.41E-07	lb/ton HMA	1	3.24E-04	2.37E-04	Yes
75003	Ethyl chloride	75-00-3	8.73E-09	lb/ton HMA	1	5.24E-06	3.83E-06	Yes
74873	Methyl chloride	74-87-3	6.24E-07	lb/ton HMA	1	3.74E-04	2.73E-04	Yes
98828	Isopropylbenzene	98-82-8	4.57E-06	lb/ton HMA	1	2.74E-03	2.00E-03	Yes
100414	Ethylbenzene	100-41-4	1.16E-05	lb/ton HMA	1	6.99E-03	5.10E-03	Yes
50000	Formaldehyde	50-00-0	3.66E-06	lb/ton HMA	1	2.20E-03	1.60E-03	Yes
110543	N-Hexane	110-54-3	6.24E-06	lb/ton HMA	1	3.74E-03	2.73E-03	Yes
540841	2,2,4-Trimethylpentane	540-84-1	7.49E-08	lb/ton HMA	1	4.49E-05	3.28E-05	Yes
75092	Dichloromethane	75-09-2	0.00E+00	lb/ton HMA	1	0.00E+00	0.00E+00	Yes
1634044	Tert-butyl methyl ether	1634-04-4	0.00E+00	lb/ton HMA	1	0.00E+00	0.00E+00	Yes
100425	Styrene	100-42-5	3.04E-07	lb/ton HMA	1	1.82E-04	1.33E-04	Yes
127184	Perchloroethylene	127-18-4	3.20E-07	lb/ton HMA	1	1.92E-04	1.40E-04	Yes
108883	Toluene	108-88-3	8.73E-06	lb/ton HMA	1	5.24E-03	3.83E-03	Yes
71556	1,1,1-Trichloroethane	71-55-6	0.00E+00	lb/ton HMA	1	0.00E+00	0.00E+00	Yes
79016	Trichloroethylene	79-01-6	0.00E+00	lb/ton HMA	1	0.00E+00	0.00E+00	Yes
75694	Trichlorofluoromethane	75-69-4	5.41E-08	lb/ton HMA	1	3.24E-05	2.37E-05	No
1330207	Isomers of xylene	1330-20-7	1.71E-05	lb/ton HMA	1	1.02E-02	7.47E-03	Yes
95476	o-Xylene	95-47-6	3.33E-06	lb/ton HMA	1	2.00E-03	1.46E-03	Yes

[1] Emission factors are from Web-fire for Truck Load-out (SCC 3-05-002-14)

Emission Calculation Methods

E_{ST} = Maximum Short Term HMA Production (ton HMA/hr) X EF

E_A = E_F X Annual Production Limit (ton HMA/yr) / 2,000 lb/ton

where:

E_{ST} = Short Term Emissions (lb/hr);

E_A = Annual Emissions (tpy);

EF = emission factor (lb/ton HMA)

Pollutant	CAS	Compound/Organic PMc or Compund /TOC	(lb/ton)		
Acenaphthene	83-32-9	0.26%	8.86E-07		
Acenaphthylene	208-96-8	0.03%	9.55E-08		
Anthracene	120-12-7	0.07%	2.39E-07		
Benzo (a) anthracene	56-55-3	0.02%	6.48E-08		
Benzo (b) fluoranthene	205-99-2	0.01%	2.59E-08		
Benzo (k) fluoranthene	207-08-9	0.00%	7.50E-09		
Benzo (g,h,i) perylene	191-24-2	0.00%	6.48E-09		
Benzo (a) pyrene	50-32-8	0.00%	7.84E-09		
Benzo (e) pyrene	192-97-2	0.01%	2.66E-08		
Chrysene	218-01-9	0.10%	3.51E-07		
Dibenzo(a,h) anthracene	53-70-3	0.00%	1.26E-09		
Fluoranthene	206-44-0	0.05%	1.70E-07		
Fluorene	86-73-7	0.77%	2.63E-06		
Indeno(1,2,3-cd)pyrene	193-39-5	0.00%	1.60E-09		
2-Methyl Naphthalene	91-57-6	2.38%	8.11E-06		
Naphthalene	91-20-3	1.25%	4.26E-06		
Perylene	198-55-0	0.02%	7.50E-08		
Phenanthrene	85-01-8	0.81%	2.76E-06		
Pyrene	129-00-0	0.15%	5.11E-07		
Phenol	108-95-2	1.18%	4.02E-06		
Acetone	67-64-1	0.05%	1.91E-06		
Ethylene	74-85-1	0.71%	2.95E-05		
Benzene	71-43-2	0.05%	2.16E-06		
Methyl bromide	74-83-9	0.01%	3.99E-07		
Methyl ethyl ketone	78-93-3	0.05%	2.04E-06		
Carbon sulfide	75-15-0	0.01%	5.41E-07		
Ethyl chloride	75-00-3	0.00%	8.73E-09		
Methyl chloride	74-87-3	0.02%	6.24E-07		
Isopropylbenzene	98-82-8	0.11%	4.57E-06		
Ethylbenzene	100-41-4	0.28%	1.16E-05		
Formaldehyde	50-00-0	0.09%	3.66E-06		
N-Hexane	110-54-3	0.15%	6.24E-06		
2,2,4-Trimethylpentane	540-84-1	0.00%	7.49E-08		
Dichloromethane	75-09-2	0	0.00E+00		
Tert-butyl methyl ether	1634-04-4	0	0.00E+00		
Styrene	100-42-5	0.01%	3.04E-07		
Perchloroethylene	127-18-4	0.01%	3.20E-07		
Toluene	108-88-3	0.21%	8.73E-06		
1,1,1-Trichloroethane	71-55-6	0	0.00E+00		
Trichloroethylene	79-01-6	0	0.00E+00		
Trichlorofluoromethane	75-69-4	0.00%	5.41E-08		
Isomers of xylene	1330-20-7	0.41%	1.71E-05		
o-Xylene	95-47-6	0.08%	3.33E-06		

0.037664

Table 5.3 - Proposed Silo Filling NSR Regulated Pollutant Estimated Emissions

Air Permit to Install Application
Ajax Materials, Genesee Twp, Michigan

Maximum Short Term Production	tons HMA/hr	600
Daily Average Production	tons HMA/hr	500
Annual Production Limit	tons HMA/yr	876,322
Temperature	F	325
Asphalt Volatility Factor		-0.5

WebFirename	NSR Regulated Pollutant	Emission Factor (See Notes)		Notes	Maximum Short Term Emissions (lb/hr)	Annual Emissions (tpy)
CO	CO	1.18E-03	lb/ton HMA	1	0.7	0.5
Nox	NO_X					
PM10 F	PM	5.86E-04	lb/ton HMA	1	0.4	0.3
PM10	PM_{10}	8.40E-04	lb/ton HMA	1,2	0.4	0.4
PM2.5	$PM_{2.5}$	8.40E-04	lb/ton HMA	1,2	0.4	0.4
SO2	SO_2					
VOC	VOC	1.22E-02	lb/ton HMA	1	7.3	5.3

[1] Emission factors are from AP-42 Table 11.1-14 for SCC 3-05-002-14 for Truck Load-out Emissions
[2] lb/hr emission rates based on daily average production

Emission Calculation Methods

E_{ST} = Maximum Short Term HMA Production (ton HMA/hr) X EF
E_A = E_F X Annual Production Limit (ton HMA/yr) / 2,000 lb/ton
where:
E_{ST} = Short Term Emissions (lb/hr);
E_A = Annual Emissions (tpy);
EF = emission factor (lb/ton HMA)

CO_2e

CO_2e (lb/hr) = CO_2 (lb/hr) x 1 + CH_4 (lb/hr) x 25 + N_2O (lb/hr) x 298

FORMULA	AP42SECT	NOTES	REF	DESC	QUALITY	NUMSOU	Created	REVOKED	Dupcount	Dupreason
	11.1	Calculated	EPA.	200(	E	0	00:00.0		0	
	11.1	This factor	EPA.	200(	E	0	36861		0	

Table 5.4 - Proposed Silo Filling TAC Emissions

Air Permit to Install Application

Ajax Materials, Genesee Twp, Michigan

Maximum Short Term Production	tons HMA/hr	600
Annual Production Limit	tons HMA/yr	876,322
Organic PM	lb/ton	2.54E-04
TOC	lb/ton	1.22E-02

CAS No hyphens	Toxic Air Contaminant	CAS No.	Emission Factor (See Notes)		Notes	Maximum Short Term Emissions (lb/hr)	Annual Emissions (tpy)	HAP?
83329	Acenaphthene	83-32-9	1.19E-06	lb/ton HMA	1	7.16E-04	5.23E-04	Yes
208968	Acenaphthylene	208-96-8	3.55E-08	lb/ton HMA	1	2.13E-05	1.56E-05	Yes
120127	Anthracene	120-12-7	3.30E-07	lb/ton HMA	1	1.98E-04	1.45E-04	Yes
56553	Benzo (a) anthracene	56-55-3	1.42E-07	lb/ton HMA	1	8.53E-05	6.23E-05	Yes
205992	Benzo (b) fluoranthene	205-99-2	0.00E+00	lb/ton HMA	1	0.00E+00	0.00E+00	Yes
207089	Benzo (k) fluoranthene	207-08-9	0.00E+00	lb/ton HMA	1	0.00E+00	0.00E+00	Yes
191242	Benzo (g,h,i) perylene	191-24-2	0.00E+00	lb/ton HMA	1	0.00E+00	0.00E+00	Yes
50328	Benzo (a) pyrene	50-32-8	0.00E+00	lb/ton HMA	1	0.00E+00	0.00E+00	Yes
192972	Benzo (e) pyrene	192-97-2	2.41E-08	lb/ton HMA	1	1.45E-05	1.06E-05	Yes
218019	Chrysene	218-01-9	5.33E-07	lb/ton HMA	1	3.20E-04	2.34E-04	Yes
53703	Dibenzo(a,h) anthracene	53-70-3	0.00E+00	lb/ton HMA	1	0.00E+00	0.00E+00	Yes
206440	Fluoranthene	206-44-0	3.81E-07	lb/ton HMA	1	2.29E-04	1.67E-04	Yes
86737	Fluorene	86-73-7	2.56E-06	lb/ton HMA	1	1.54E-03	1.12E-03	Yes
193395	Indeno(1,2,3-cd)pyrene	193-39-5	0.00E+00	lb/ton HMA	1	0.00E+00	0.00E+00	Yes
91576	2-Methyl Naphthalene	91-57-6	1.34E-05	lb/ton HMA	1	8.03E-03	5.86E-03	Yes
91203	Naphthalene	91-20-3	4.62E-06	lb/ton HMA	1	2.77E-03	2.02E-03	Yes
198550	Perylene	198-55-0	7.62E-08	lb/ton HMA	1	4.57E-05	3.34E-05	Yes
85018	Phenanthrene	85-01-8	4.57E-06	lb/ton HMA	1	2.74E-03	2.00E-03	Yes
129000	Pyrene	129-00-0	1.12E-06	lb/ton HMA	1	6.70E-04	4.89E-04	Yes
108952	Phenol	108-95-2	0.00E+00	lb/ton HMA	1	0.00E+00	0.00E+00	Yes
67641	Acetone	67-64-1	6.70E-06	lb/ton HMA	1	4.02E-03	2.94E-03	No
74851	Ethylene	74-85-1	1.34E-04	lb/ton HMA	1	8.04E-02	5.87E-02	No
71432	Benzene	71-43-2	3.90E-06	lb/ton HMA	1	2.34E-03	1.71E-03	Yes
74839	Methyl bromide	74-83-9	5.97E-07	lb/ton HMA	1	3.58E-04	2.62E-04	Yes
78933	Methyl ethyl ketone	78-93-3	4.75E-06	lb/ton HMA	1	2.85E-03	2.08E-03	Yes
75150	Carbon sulfide	75-15-0	1.95E-06	lb/ton HMA	1	1.17E-03	8.54E-04	Yes
75003	Ethyl chloride	75-00-3	4.87E-07	lb/ton HMA	1	2.92E-04	2.14E-04	Yes
74873	Methyl chloride	74-87-3	2.80E-06	lb/ton HMA	1	1.68E-03	1.23E-03	Yes
98828	Isopropylbenzene	98-82-8	0.00E+00	lb/ton HMA	1	0.00E+00	0.00E+00	Yes
100414	Ethylbenzene	100-41-4	4.63E-06	lb/ton HMA	1	2.78E-03	2.03E-03	Yes
50000	Formaldehyde	50-00-0	8.41E-05	lb/ton HMA	1	5.05E-02	3.68E-02	Yes
110543	N-Hexane	110-54-3	1.22E-05	lb/ton HMA	1	7.31E-03	5.34E-03	Yes
540841	2,2,4-Trimethylpentane	540-84-1	3.78E-08	lb/ton HMA	1	2.27E-05	1.66E-05	Yes
75092	Dichloromethane	75-09-2	3.29E-08	lb/ton HMA	1	1.97E-05	1.44E-05	Yes
1634044	Tert-butyl methyl ether	1634-04-4	0.00E+00	lb/ton HMA	1	0.00E+00	0.00E+00	Yes
100425	Styrene	100-42-5	6.58E-07	lb/ton HMA	1	3.95E-04	2.88E-04	Yes
127184	Perchloroethylene	127-18-4	0.00E+00	lb/ton HMA	1	0.00E+00	0.00E+00	Yes
108883	Toluene	108-88-3	7.56E-06	lb/ton HMA	1	4.53E-03	3.31E-03	Yes
71556	1,1,1-Trichloroethane	71-55-6	0.00E+00	lb/ton HMA	1	0.00E+00	0.00E+00	Yes
79016	Trichloroethylene	79-01-6	0.00E+00	lb/ton HMA	1	0.00E+00	0.00E+00	Yes
75694	Trichlorofluoromethane	75-69-4	0.00E+00	lb/ton HMA	1	0.00E+00	0.00E+00	No
1330207	Isomers of xylene	1330-20-7	2.44E-05	lb/ton HMA	1	1.46E-02	1.07E-02	Yes
95476	o-Xylene	95-47-6	6.95E-06	lb/ton HMA	1	4.17E-03	3.04E-03	Yes

[1] Emission factors are from Web-fire for Truck Load-out (SCC 3-05-002-14)

Pollutant	CAS	Compound/Organic PMc or Compund/TOC	(lb/ton)			
Acenaphthene	83-32-9	0.47%	1.19E-06			
Acenaphthylene	208-96-8	0.01%	3.55E-08			
Anthracene	120-12-7	0.13%	3.30E-07			
Benzo (a) anthracene	56-55-3	0.06%	1.42E-07			
Benzo (b) fluoranthene	205-99-2	0.00%	0.00E+00			
Benzo (k) fluoranthene	207-08-9	0.00%	0.00E+00			
Benzo (g,h,i) perylene	191-24-2	0.00%	0.00E+00			
Benzo (a) pyrene	50-32-8	0.00%	0.00E+00			
Benzo (e) pyrene	192-97-2	0.01%	2.41E-08			
Chrysene	218-01-9	0.21%	5.33E-07			
Dibenzo(a,h) anthracene	53-70-3	0.00%	0.00E+00			
Fluoranthene	206-44-0	0.15%	3.81E-07			
Fluorene	86-73-7	1.01%	2.56E-06			
Indeno(1,2,3-cd)pyrene	193-39-5	0.00%	0.00E+00			
2-Methyl Naphthalene	91-57-6	5.27%	1.34E-05			
Naphthalene	91-20-3	1.82%	4.62E-06			
Perylene	198-55-0	0.03%	7.62E-08			
Phenanthrene	85-01-8	1.80%	4.57E-06			
Pyrene	129-00-0	0.44%	1.12E-06			
Phenol	108-95-2	0.00%	0.00E+00			
Acetone	67-64-1	0.06%	6.70E-06			
Ethylene	74-85-1	1.10%	1.34E-04			
Benzene	71-43-2	0.03%	3.90E-06			
Methyl bromide	74-83-9	0.00%	5.97E-07			
Methyl ethyl ketone	78-93-3	0.04%	4.75E-06			
Carbon sulfide	75-15-0	0.02%	1.95E-06			
Ethyl chloride	75-00-3	0.00%	4.87E-07			
Methyl chloride	74-87-3	0.02%	2.80E-06			
Isopropylbenzene	98-82-8	0.00%	0.00E+00			
Ethylbenzene	100-41-4	0.04%	4.63E-06			
Formaldehyde	50-00-0	0.69%	8.41E-05			
N-Hexane	110-54-3	0.10%	1.22E-05			100-54-3
2,2,4-Trimethylpentane	540-84-1	0.00%	3.78E-08			
Dichloromethane	75-09-2	0.00%	3.29E-08			
Tert-butyl methyl ether	1634-04-4	0	0.00E+00			
Styrene	100-42-5	0.01%	6.58E-07			
Perchloroethylene	127-18-4	0.00%	0.00E+00			
Toluene	108-88-3	0.06%	7.56E-06			
1,1,1-Trichloroethane	71-55-6	0	0.00E+00			
Trichloroethylene	79-01-6	0	0.00E+00			
Trichlorofluoromethane	75-69-4	0.00%	0.00E+00			
Isomers of xylene	1330-20-7	0.20%	2.44E-05			
o-Xylene	95-47-6	0.06%	6.95E-06			

0.080607

Emission Calculation Methods

E_{ST} = Maximum Short Term HMA Production (ton HMA/hr) X EF

E_A = E_F X Annual Production Limit (ton HMA/yr) / 2,000 lb/ton

where:

E_{ST} = Short Term Emissions (lb/hr);

E_A = Annual Emissions (tpy);

EF = emission factor (lb/ton HMA)

Table 5.5b - Proposed Yard Haul Road NSR Regulated Pollutant Estimated Emissions - Front End Loader in Storage Yard ***(Revised June 2021)***

Air Permit to Install Application
Ajax Materials, Genesee Twp, Michigan

Daily Average Production	tons HMA/hr	500
Annual Production Limit	tons HMA/yr	876,322
Control[7] (Approved Fugitve Dust Control Plan)		90%
Distance to Piles (average)	feet	525
Vehicle Type	Front End Loader	
Weight Loaded (ton)	Max Payload	55.27
Weight Unloaded (ton)	CAT 988H	42.77
FEL Payload (ton)		12.5
Annual Vehicle Miles Traveled	VMT	597

Particle Size	k[2] Particle Size Multiplier (lb/VMT)	s[3] Surface Material Silt Content (%)	a[2] Constant	b[2] Constant	W Average weight of vehicles (tons)	Particulate Emission[4] (lb/VMT)	P[5] Number of Wet Days in average period	Particulate Emission[6] (lb/VMT)	Fugitive Dust Control Program additional control[7] (%)	Vehicle Miles Traveled (annual)[8]	Emissions (ton/yr)
PM30	4.90	3.9	0.7	0.45	49.0	7.84	120	5.26	90%	597	0.16
PM10	1.50	3.9	0.9	0.45	49.0	1.92	120	1.29	90%	597	0.04
PM2.5	0.15	3.9	0.9	0.45	49.0	0.19	120	0.13	90%	597	0.00

Short Term Emissions for Modeling - Max lb/hr

Trips per hour	VMT per hour (round trip)	Particulate Emissions lb/hr
1.00	1.99E-01	0.10
1.00	1.99E-01	0.03
1.00	1.99E-01	0.00

1 - Emission estimation from Ap-42 Chapter 13.2.2 Unpaved Roads (November 2006)
2 - AP-42 Table 13.2.2-2
3 - Information updated from the MS Excel spreadsheet containing a list of Surface Material Silt Content by State in the related information for AP-42 Section 13.2.2
4 - Predictive Emission Factor Equation AP-42 Chapter 13.2.2 Equation 1a - $E = k \times (s/12)^a \times (W/3)^b$
5 - AP-42 Figure 13.2.2-1 (averaging period 365 days)
6 - Predictive Emission Factor Equation AP-42 Chapter 13.2.2 Equation 2 - $E_{ext} = E \times [(365 - P)/365]$
7 - Fugitive Dust control, which may include dust suppressants, will be applied to unpaved roads as needed.
8 - Vehicle miles traveled estimated as Distance/trip X 2 trips / 5280 feet X 3000 trips per year

Table 5.5c - Proposed Yard Haul Road NSR Regulated Pollutant Estimated Emissions - Aggregate Truck in Storage Yard *(Revised June 2021)*

Air Permit to Install Application

Ajax Materials, Genesee Twp, Michigan

Maximum Short Term Production	Daily Average tons HMA/hr	500
Annual Production Limit	tons HMA/yr	876,322
Control[7] (Approved Fugitve Dust Control Plan)		90%
Distance to Yard	feet	500
Vehicle Type	Aggregate Trucks	
Weight Loaded (ton)	Max Payload	73.50
Weight Unloaded (ton)		23.50
Truck Payload (ton)		50
Annual Vehicle Miles Traveled	VMT	568

Particle Size	k[2] Particle Size Multiplier (lb/VMT)	s[3] Surface Material Silt Content (%)	a[2] Constant	b[2] Constant	W Average weight of vehicles (tons)	Particulate Emission[4] (lb/VMT)	P[5] Number of Wet Days in average period	Particulate Emission[6] (lb/VMT)	Fugitive Dust Control Program additional control[7] (%)	Vehicle Miles Traveled (annual)[8]	Emissions (ton/yr)
PM30	4.90	3.9	0.7	0.45	48.5	7.81	120	5.24	90%	568	0.15
PM10	1.50	3.9	0.9	0.45	48.5	1.91	120	1.28	90%	568	0.04
PM2.5	0.15	3.9	0.9	0.45	48.5	0.19	120	0.13	90%	568	0.00

Short Term Emissions for Modeling - Max lb/hr

Trips per hour	VMT per hour (round trip)	Particulate Emissions w rain days lb/hr
1.00	0.19	0.10
1.00	0.19	0.02
1.00	0.19	0.00

1 - Emission estimation from Ap-42 Chapter 13.2.2 Unpaved Roads (November 2006)
2 - AP-42 Table 13.2.2-2
3 - Information updated from the MS Excel spreadsheet containing a list of Surface Material Silt Content by State in the related information for AP-42 Section 13.2.2
4 - Predictive Emission Factor Equation AP-42 Chapter 13.2.2 Equation 1a - $E = k \times (s/12)^a \times (W/3)^b$
5 - AP-42 Figure 13.2.2-1 (averaging period 365 days)
6 - Predictive Emission Factor Equation AP-42 Chapter 13.2.2 Equation 2 - $E_{ext} = E \times [(365 - P)/365]$
7 - Fugitive Dust control, which may include dust suppressants, will be applied to unpaved roads as needed.
8 - Vehicle miles traveled estimated as Distance/trip X 2 trips / 5280 feet X 3000 trips per year

PTY 0001
PTY 0002
PTY 0003
PTY 0004
PTY 0005
PTY 0006
PTY 0007
PTY 0008
PTY 0009
PTY 0010
PTY 0011
PTY 0012
PTY 0013
PTY 0014
PTY 0015
PTY 0016

Table 13.2.2-2. CONSTANTS FOR EQUATIONS 1a AND 1b

Constant	Industrial Roads (Equation 1a)			Public Roads (Equation 1b)		
	PM-2.5	PM-10	PM-30*	PM-2.5	PM-10	PM-30*
k (lb/VMT)	0.15	1.5	4.9	0.18	1.8	6.0
a	0.9	0.9	0.7	1	1	1
b	0.45	0.45	0.45	-	-	-
c	-	-	-	0.2	0.2	0.3
d	-	-	-	0.5	0.5	0.3
Quality Rating	B	B	B	B	B	B

*Assumed equivalent to total suspended particulate matter (TSP)
"-" = not used in the emission factor equation

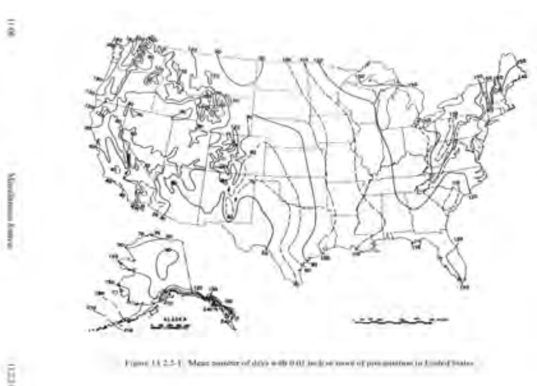

Figure 13.2.2-1. Mean number of days with 0.01 inch or more of precipitation in United States

https://www.trkattachments.com/specs/wheelloader.php?title=Caterpillar_988H_Wheel_Loader

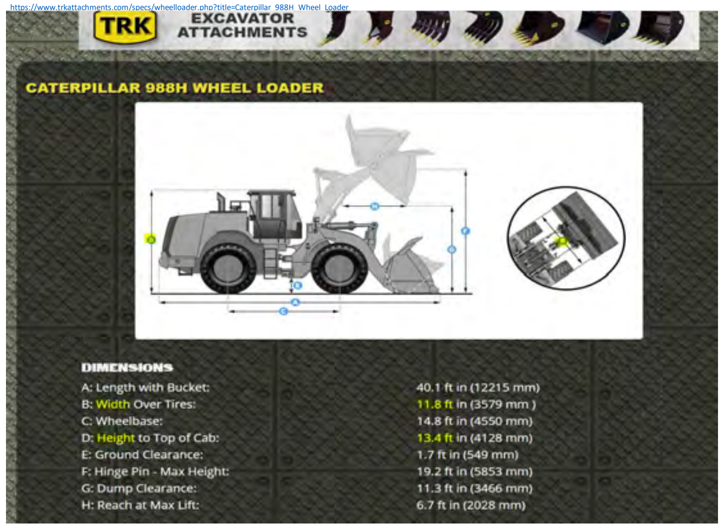

Table 5.5d - Proposed Paved Road NSR Regulated Pollutant Estimated Emissions*(Revised June 2021)*

Air Permit to Install Application
Ajax Materials, Genesee Twp, Michigan

Daily Average Production	tons HMA/yr	500
Annual Production Limit	tons HMA/yr	876,322
Control[7] (Approved Fugitve Dust Control Plan)		90%
Vehicle Type	Asphalt Trucks	
Average Weight Loaded (ton)		49.07
Average Weight Unloaded (ton)		19.55
FEL Payload (ton)		29.52
Distance traveled unloaded	feet	925
Annual Vehicle Miles Traveled Unloaded	VMT	5,201
Distance traveled Loaded	feet	200
Annual Vehicle Miles Traveled Loaded	VMT	1,124
Vehicle Type	Aggregate Trucks	
Average Weight Loaded (ton)		73.50
Average Weight Unloaded (ton)		23.50
FEL Payload (ton)		50
Distance traveled one way - south route	feet	1,050
Annual Vehicle Miles Traveled Unloaded	VMT	6,971

Emission Factor Development

					Use for long term				
Particle Size	k[2] Particle Size Multiplier (lb/VMT)	sL3 Road Surface Silt Loading (g/m2)	W Average weight of vehicles (tons)	Particulate Emission[4] (lb/VMT)	P[5] Number of Wet Days in average period	N Averaging period (days)	Particulate Emission[6] (lb/VMT)	Vehicle Miles Traveled (annual)	Emissions (ton/yr)
Empty Trucks									
PM30	0.011	2.4	19.5	0.51	120	365	0.46	5,201	0.12
PM10	0.0022	2.4	19.5	0.10	120	365	0.09	5,201	0.02
PM2.5	0.00054	2.4	19.5	0.02	120	365	0.02	5,201	0.01
Loaded Trucks									
PM30	0.011	2.4	49.1	1.29	120	365	1.19	1,124	0.07
PM10	0.0022	2.4	49.1	0.26	120	365	0.24	1,124	0.01
PM2.5	0.00054	2.4	49.1	0.06	120	365	0.06	1,124	0.00

Aggregate Trucks - South Route									
PM30	0.011	2.4	48.5	1.28	120	365	1.17	6,971	0.41
PM10	0.0022	2.4	48.5	0.26	120	365	0.23	6,971	0.08
PM2.5	0.00054	2.4	48.5	0.06	120	365	0.06	6,971	0.02
								PM Total	0.60
								PM10 Total	0.12
								PM2.5 Total	0.03

1 - Emission estimation from Ap-42 Chapter 13.2.1 Paved Roads (January 2011)

2 - AP-42 Table 13.2.1-1

3 - AP-42 Table 13.2.1-2 - peak Ubiquitous Silt Loading Default Values

4 - Predictive Emission Factor Equation AP-42 Chapter 13.2.1 Equation 1 - $E = k X (sL)^{0.91} X (W)^{1.02}$

5 - AP-42 Figure 13.2.1-2 (averaging period 365 days)

6 - Daily average Predictive Emission Factor Equation AP-42 Chapter 13.2.1 Equation 2 - $E = [k X (sL)^{0.91} X (W)^{1.02]} X (1-P/4N)$

Table 5.6a -Proposed Yard Emissions - Load in/Load Out *(Revised June 2021)*
Air Permit to Install Application
Ajax Materials, Genesee Twp, Michigan

Maximum Short Term Production	Daily Average tons HMA/hr	500
Annual Production Limit	tons HMA/yr	876,322
Control (Approved Fugitve Dust Control Plan)		80%

Emissions	Emissions (lb/ton)	% Control	Total (tpy)	Short term Emissions (lb/day)	Short term (lb/hr)	Emissions (g/s)
PM	1.60E-05		0.01	0.19	0.01	0.001008
PM_{10}	1.60E-05		0.01	0.19	0.01	0.001008
$PM_{2.5}$	1.60E-05		0.01	0.19	0.01	0.001008

Table 11.19.2-2 (English Units). Emission Factors For Crushed Stone Processing Operations (lb/Ton) Truck unloading stone to pile
Control efficiency of 80% for an approved fugitive dust control plan - per MDEQ HMA Fact sheet. The Control Effeciency of 0% indicated in the table was conservative for use in modeling.

Table 5.6a -Proposed Yard Emissions - Wind Emissions from Continuously Active Piles *(Revised June 2021)*
Air Permit to Install Application
Ajax Materials, Genesee Twp, Michigan

Maximum Short Term Production	**Daily Average tons HMA/hr**	500
Annual Production Limit	tons HMA/yr	876,322
Control (Approved Fugitve Dust Control Plan)[2]		
Acres of Active Storage Piles	acres	5

Emissions	% of total	s[3]	p	f	Emissions (lb/day/acre)	% Control	Total[1] (tpy)	Short term (lb/hr)	Emissions (g/s)
PM	100%	4.4	120	25.21	8.74	0%	7.97		
PM_{10}	31%	4.4	120	29.00	3.08	0%	2.81	2.21	0.278510638
$PM_{2.5}$	3%	4.4	120	29.00	0.31	0%	0.28	0.22	0.027851064

1 - Emissions conservativelty calculated based on Control of Open Fugitive Dust Sources. AP-42 Section 13.2.5 Indutrial Wind Erosion methodology indicates a maximum potential emissions of 1,315 pounds per year, not taking into account control, snow, rain and frozen conditions.
2 - Control efficiency of 80% for an approved fugitive dust control plan - per MDEQ HMA Fact sheet. The Control Effeciency of 0% indicated in the table was conservative for use in modeling.

3 - Silt content represents a worst case used for short term dispersion modeling. Maximum silt content of materials proposed for use at Ajax is 4%. This silt content represents less 5% of annual usage. An additional 10% safety factor has been applied. Actual weighted silt content is only 1.9%.

Emissions only occur when wind speeds exceed 12 mph.
PM emissions can be calculated from continuously active storage piles using the metholodogy outlined in "Control of Open Fugitive Dust Sources" Equation 4-9:
E = 1.7 x (s/1.5) x ((365-p)/235) x (f/15)

E = Emissions TSP or PM in (lb/day/acre)
s = silt content (AP-42 Table 13.2.2-1 for sand and gravel yard)
p = number of days with > 0.01 inches precipitation per year from AP-42 Figure 13.2.2-2 (averaging period 365 days)
f = percentage of time that the unobstructed wind speed exceeds 5.14 m/s, 11.5 mph (using Flint Airport data for 2019), 2,540 hours ir 2019

PM percent of total:
From AP-42 13.2.2-2 the Particulate constants were used to determine PM10 and PM2.5 percent of total PM as follows

	PM	PM10	PM2.5
k	4.9	1.5	0.15
% of PM	100%	31%	3%

Table 5.5a - Proposed Yard Haul Road NSR Regulated Pollutant Estimated Emissions - Front End Loader to Piles *(Revised May 2021)*

Air Permit to Install Application

Ajax Materials, Genesee Twp, Michigan

Daily Average Production	tons HMA/yr	500
Annual Production Limit	tons HMA/yr	876,322
Control[7] (Approved Fugitve Dust Control Plan)		90%
Distance to Piles (average)	feet	100
Vehicle Type	Front End Loader	
Weight Loaded (ton)	Max Payload	55.27
Weight Unloaded (ton)	CAT 988H	42.77
FEL Payload (ton)		12.5
Annual Vehicle Miles Traveled	VMT	2,656

Particle Size	k[2] Particle Size Multiplier (lb/VMT)	s[3] Surface Material Silt Content (%)	a[2] Constant	b[2] Constant	W Average weight of vehicles (tons)	Particulate Emission[4] (lb/VMT)	P[5] Number of Wet Days in average period	Particulate Emission[6] (lb/VMT)	Fugitive Dust Control Program additional control[7] (%)	Vehicle Miles Traveled (annual)[8]	Emissions (ton/yr)
PM30	4.90	3.9	0.7	0.45	49.0	7.84	120	5.26	90%	2,656	0.70
PM10	1.50	3.9	0.9	0.45	49.0	1.92	120	1.29	90%	2,656	0.17
PM2.5	0.15	3.9	0.9	0.45	49.0	0.19	120	0.13	90%	2,656	0.02

Short Term Emissions for Modeling - Max lb/hr

Trips per hour	VMT per hour (round trip)	Particulate Emissions w/o rain days lb/hr	Number of Sources	Particulate Emissions days lb/hr/source	Particulate Emissions g/s/source
40.00	1.52	0.80	55	0.0145	1.83E-03
40.00	1.52	0.20	55	0.0035	4.47E-04
40.00	1.52	0.02	55	0.0004	4.47E-05

202	FEL_0052	4.4565	3.2343
203	FEL_0053	4.4565	3.2343
204	FEL_0054	4.4565	3.2343
205	FEL_0055	4.4565	3.2343

1 - Emission estimation from Ap-42 Chapter 13.2.2 Unpaved Roads (November 2006)

2 - AP-42 Table 13.2.2-2

3 - Information updated from the MS Excel spreadsheet containing a list of Surface Material Silt Content by State in the related information for AP-42 Section 13.2.2

4 - Predictive Emission Factor Equation AP-42 Chapter 13.2.2 Equation 1a - $E = k \times (s/12)^a \times (W/3)^b$

5 - AP-42 Figure 13.2.2-1 (averaging period 365 days)

6 - Predictive Emission Factor Equation AP-42 Chapter 13.2.2 Equation 2 - Eext = E X [(365 - P)/365]

7 - Fugitive Dust control, which may include dust suppressants, will be applied to unpaved roads as needed.

8 - Vehicle miles traveled estimated as Annual HMA / Payload X Distance/trip X 2 trips / 5280 feet

Table 12.1 - Maximum Hourly Emission Rates

0
0

Toxic Air Contaminant	CAS No.	HMA Dryer (lb/hr)	Silo Heater (lb/hr)	Silo Load Out (lb/hr)	AC Tank (lb/hr)	Silo Filling (lb/hr)	Total (lb/hr)
Ethylbenzene	100-41-4	0.60	-	0.01	0.01	0.00	0.62
Benzaldehyde	100-52-7	0.13	-	-	-	-	0.13
Quinone	106-51-4	0.21	-	-	-	-	0.21
n-Butane	106-97-8	0.80	-	-	-	-	0.80
Acrolein	107-02-8	0.60	-	-	-	-	0.60
Toluene	108-88-3	3.60	0.00	0.01	0.01	0.00	3.62
N-Pentane	109-66-0	0.25	-	-	-	-	0.25
1-Pentene	109-67-1	2.64	-	-	-	-	2.64
N-Hexane	110-54-3	1.21	0.00	0.00	0.00	0.01	1.23
Valeraldehyde	110-62-3	0.08	-	-	-	-	0.08
Anthracene	120-12-7	0.00	0.00	0.00	0.00	0.00	4.6E-03
Propionaldehyde	123-38-6	0.17	-	-	-	-	0.17
Butyraldehyde	123-72-8	0.19	-	-	-	-	0.19
Pyrene	129-00-0	0.00	0.00	0.00	0.00	0.00	5.2E-03
Isomers of xylene	1330-20-7	0.60	-	0.01	0.01	0.01	0.64
Heptane	142-82-5	11.28	-	-	-	-	11.28
2,3,7,8-Tetrachlorodibenzo-p-dioxin	1746-01-6	0.00	-	-	-	-	2.8E-10
Chromium (VI)	7440-47-3	0.00	0.00	-	-	-	1.8E-03
Benzo (g,h,i) perylene	191-24-2	0.00	0.00	0.00	0.00	-	6.1E-05
Benzo (e) pyrene	192-97-2	0.00	-	0.00	0.00	0.00	1.9E-04
Indeno(1,2,3-cd)pyrene	193-39-5	0.00	0.00	0.00	0.00	-	1.1E-05
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	19408-74-3	0.00	-	-	-	-	1.3E-09
Perylene	198-55-0	0.00	-	0.00	0.00	0.00	1.5E-04
Benzo (b) fluoranthene	205-99-2	0.00	0.00	0.00	0.00	-	1.6E-04
Fluoranthene	206-44-0	0.00	0.00	0.00	0.00	0.00	1.2E-03
Benzo (k) fluoranthene	207-08-9	0.00	0.00	0.00	0.00	-	6.3E-05
Acenaphthylene	208-96-8	0.03	0.00	0.00	0.00	0.00	0.03
Chrysene	218-01-9	0.00	0.00	0.00	0.00	0.00	9.8E-04
Octachlorodibenzo-p-dioxins, total	3268-87-9	0.00	-	-	-	-	3.6E-06
Hexachlorodibenzo-p-dioxins, total	34465-46-8	0.00	-	-	-	-	7.1E-09
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	35822-46-9	0.00	-	-	-	-	4.5E-08
Octachlorodibenzofurans, total	39001-02-0	0.00	-	-	-	-	6.3E-09
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	39227-28-6	0.00	-	-	-	-	5.5E-10
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	40321-76-4	0.00	-	-	-	-	4.1E-10
2-Butenal	4170-30-3	0.10	-	-	-	-	0.10
Formaldehyde	50-00-0	6.00	0.00	0.00	0.00	0.05	6.05
Benzo (a) pyrene	50-32-8	0.00	0.00	0.00	0.00	-	2.2E-05
2,3,7,8-Tetrachlorodibenzofuran	51207-31-9	0.00	-	-	-	-	1.3E-09
2-Methyl-2-butene	513-35-9	0.70	-	-	-	-	0.70
2,2,4-Trimethylpentane	540-84-1	0.05	-	0.00	0.00	0.00	0.05
1,2,3,4,7,8,9-Heptachlorodibenzofuran	55673-89-7	0.00	-	-	-	-	3.6E-09
Benzo (a) anthracene	56-55-3	0.00	0.00	0.00	0.00	0.00	4.4E-04
2,3,4,7,8-Pentachlorodibenzofuran	57117-31-4	0.00	-	-	-	-	1.1E-09
1,2,3,7,8-Pentachlorodibenzofuran	57117-41-6	0.00	-	-	-	-	5.7E-09
1,2,3,6,7,8-Hexachlorodibenzofuran	57117-44-9	0.00	-	-	-	-	1.6E-09
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	57653-85-7	0.00	-	-	-	-	1.7E-09
Isovaleraldehyde	590-86-3	0.04	-	-	-	-	0.04
2,3,4,6,7,8-Hexachlorodibenzofuran	60851-34-5	0.00	-	-	-	-	2.1E-09
Hexanal	66-25-1	0.13	-	-	-	-	0.13
1,2,3,4,6,7,8-Heptachlorodibenzofuran	67562-39-4	0.00	-	-	-	-	1.5E-08
Acetone	67-64-1	1.00	-	0.00	0.00	0.00	1.00
1,2,3,4,7,8-Hexachlorodibenzofuran	70648-26-9	0.00	-	-	-	-	7.1E-09
Benzene	71-43-2	0.60	0.00	0.00	0.00	0.00	0.60

1,1,1-Trichloroethane	71-55-6	0.06	-	-	-	-	0.06
1,2,3,7,8,9-Hexachlorodibenzofuran	72918-21-9	0.00	-	-	-	-	1.1E-08
Manganese	7439-96-5	0.03	0.00	-	-	-	0.03
Mercury	7439-97-6	0.00	0.00	-	-	-	6.2E-04
Nickel	7440-02-0	0.06	0.00	-	-	-	0.06
Silver	7440-22-4	0.00	-	-	-	-	1.2E-03
Thallium	7440-28-0	0.01	-	-	-	-	5.3E-03
Antimony	7440-36-0	0.00	-	-	-	-	4.3E-04
Arsenic	7440-38-2	0.00	0.00	-	-	-	1.8E-03
Barium	7440-39-3	0.60	0.00	-	-	-	0.60
Beryllium	7440-41-7	-	0.00	-	-	-	2.4E-08
Cadmium	7440-43-9	0.00	0.00	-	-	-	6.0E-04
Chromium	7440-47-3	0.00	0.00	-	-	-	1.8E-03
Cobalt	7440-48-4	0.04	0.00	-	-	-	0.04
Copper	7440-50-8	0.41	0.00	-	-	-	0.41
Zinc	7440-66-6	0.43	0.00	-	-	-	0.43
Ethylene	74-85-1	8.40	-	0.02	0.02	0.08	8.52
Acetaldehyde	75-07-0	1.72	-	-	-	-	1.72
2-Methyl-1-pentene	763-29-1	4.80	-	-	-	-	4.80
Hydrogen chloride	7647-01-0	14.25	-	-	-	-	14.25
Phosphorus (yellow or white)	7723-14-0	2.88	-	-	-	-	2.88
Selenium	7782-49-2	0.01	0.00	-	-	-	5.8E-03
Methyl ethyl ketone	78-93-3	0.02	-	0.00	0.00	0.00	0.03
Acenaphthene	83-32-9	0.00	0.00	0.00	0.00	0.00	3.6E-03
Phenanthrene	85-01-8	0.03	0.00	0.00	0.00	0.00	0.04
Fluorene	86-73-7	0.01	0.00	0.00	0.00	0.00	0.02
Naphthalene	91-20-3	0.60	0.00	0.00	0.00	0.00	0.61
2-Methyl Naphthalene	91-57-6	0.22	0.00	0.00	0.00	0.01	0.24
3-Methylpentane	96-14-0	0.25	-	-	-	-	0.25
H2SO4	7664-93-9	1.92	-	-	-	-	1.92
Dibenzo(a,h) anthracene	53-70-3	-	0.00	0.00	0.00	-	1.5E-06
3-Methylcholanthrene	56-49-5	-	0.00	-	-	-	3.5E-09
Dimethylbenz(a)anthracene	57-97-6	-	0.00	-	-	-	3.1E-08
Molybdenum	7439-98-7	-	0.00	-	-	-	2.2E-06
Vanadium	7440-62-2	-	0.00	-	-	-	4.5E-06
Ammonia	7664-41-7	-	0.01	-	-	-	6.3E-03
Dichlorobenzene, mixed isomers	25321-22-6	-	0.00	-	-	-	2.4E-06

Notes:

No control is being accounted for due to silo load out enclosures or AC tank condenser

AC tank emissions equal to Silo Filling per AP-42 Table 11.1-15.

Model Results Table

	1 hr	8 hr	24 hr	annual

Material ID	Usage	Silt Content
1	30.0%	1.7%
2	15.0%	3.7%
3	15.0%	1.5%
4	10.0%	1.0%
5	10.0%	1.1%
6	5.0%	1.2%
7	5.0%	4.0%
8	5.0%	1.0%
9	5.0%	1.0%
Weighted Average		1.9%
Maximum		4.0%
Maximum w/Safety Factor		4.4%

Table 12.2 - Predicted Ambient Impacts

0

0

Toxic Air Contaminant	CAS No.	Emissions (lb/hr)	Model Results (μg/m³)/(lb/hr)	PAI (μg/m³)	Screening Level (μg/m³)	Averaging Period (μg/m³)	Basis	Percent of Screening Level	Pass/Fail	FootNote
Ethylbenzene	100-41-4	0.62	0.231	1.42E-01	1000	24 hr	ITSL	0.0%	PASS	-
			0.018	1.10E-02	0.4	annual	IRSL	2.7%	PASS	
Benzaldehyde	100-52-7	0.13	0.018	2.35E-03	0.4	annual	IRSL	0.6%	PASS	-
Quinone	106-51-4	0.21	0.468	9.89E-02	4.4	8 hr	ITSL	2.2%	PASS	-
n-Butane	106-97-8	0.80	0.468	3.77E-01	23800	8 hr	ITSL	0.0%	PASS	22
Acrolein	107-02-8	0.60	0.018	1.07E-02	0.16	annual	ITSL	6.7%	PASS	13
			0.728	4.37E-01	5	1 hr	2nd ITSL	8.7%	PASS	
Toluene	108-88-3	3.62	0.231	8.34E-01	5000	24 hr	ITSL	0.0%	PASS	-
N-Pentane	109-66-0	0.25	0.468	1.18E-01	17700	8 hr	ITSL	0.0%	PASS	-
N-Hexane	110-54-3	1.23	0.018	2.20E-02	700	annual	ITSL	0.0%	PASS	-
Valeraldehyde	110-62-3	0.08	0.468	3.77E-02	1760	8 hr	ITSL	0.0%	PASS	-
Anthracene	120-12-7	4.6E-03	0.018	8.16E-05	1000	annual	ITSL	0.0%	PASS	-
Propionaldehyde	123-38-6	0.17	0.018	3.06E-03	8	annual	ITSL	0.0%	PASS	-
Butyraldehyde	123-72-8	0.19	0.018	3.42E-03	7	annual	ITSL	0.0%	PASS	-
Pyrene	129-00-0	5.2E-03	0.018	9.34E-05	100	annual	ITSL	0.0%	PASS	-
Isomers of xylene	1330-20-7	0.64	0.018	1.13E-02	390	annual	ITSL	0.0%	PASS	2
Heptane	142-82-5	11.28	0.468	5.28E+00	3500	8 hr	ITSL	0.2%	PASS	-
2,3,7,8-Tetrachlorodibenzo-p-dioxin	1746-01-6	2.8E-10	0.018	4.94E-12	0.000002	annual	ITSL	0.0%	PASS	33, D
			0.018	4.94E-12	0.000000023	annual	IRSL	0.0%	PASS	
Chromium (VI)	18540-29-9	1.8E-03	0.018	3.21E-05	0.1	annual	ITSL	0.0%	PASS	-
			0.018	3.21E-05	0.000083	annual	IRSL	38.7%	PASS	
Benzo (g,h,i) perylene	191-24-2	6.1E-05	0.018	1.08E-06	13	annual	ITSL	0.0%	PASS	-
Benzo (e) pyrene	192-97-2	1.9E-04	0.231	4.42E-05	0.002	24 hr	ITSL	2.2%		A
Perylene	198-55-0	1.5E-04	0.018	2.63E-06	13	annual	ITSL	0.0%	PASS	B
Fluoranthene	206-44-0	1.2E-03	0.018	2.21E-05	140	annual	ITSL	0.0%	PASS	-
Acenaphthylene	208-96-8	0.03	0.018	5.20E-04	35	annual	ITSL	0.0%	PASS	-
2-Butenal	4170-30-3	0.10	0.728	7.51E-02	9	1 hr	ITSL	0.8%	PASS	-
Formaldehyde	50-00-0	6.05	0.231	1.40E+00	30	24 hr	ITSL	4.7%	PASS	E
		1.01	0.018	1.80E-02	0.08	annual	IRSL	22.5%	PASS	
Benzo (a) pyrene	50-32-8	2.2E-05	0.231	5.15E-06	0.002	24 hr	ITSL	0.3%	PASS	5
			0.018	3.98E-07	0.001	annual	IRSL	0.0%	PASS	
2-Methyl-2-butene	513-35-9	0.70	0.018	1.24E-02	106	annual	ITSL	0.0%	PASS	-
2,2,4-Trimethylpentane	540-84-1	0.05	0.468	2.48E-02	3500	8 hr	ITSL	0.0%	PASS	1
Isovaleraldehyde	590-86-3	0.04	0.018	6.84E-04	800	annual	ITSL	0.0%	PASS	-
Hexanal	66-25-1	0.13	0.018	2.35E-03	2	annual	ITSL	0.1%	PASS	-
Acetone	67-64-1	1.00	0.468	4.69E-01	5900	8 hr	ITSL	0.0%	PASS	-
Benzene	71-43-2	0.60	0.018	1.08E-02	30	annual	ITSL	0.0%	PASS	-
			0.231	1.39E-01	30	24 hr	2nd ITSL	0.5%	PASS	
			0.018	1.08E-02	0.1	annual	IRSL	10.8%	PASS	
1,1,1-Trichloroethane	71-55-6	0.06	0.231	1.46E-02	6000	24 hr	ITSL	0.0%	PASS	-
Manganese	7439-96-5	0.03	0.018	5.35E-04	0.3	annual	ITSL	0.2%	PASS	29
Mercury	7439-97-6	6.2E-04	0.018	1.11E-05	0.3	annual	ITSL	0.0%	PASS	7

50-32-8

191242

Annual avg

Add Rows

Add Row

Add Row

Add Row

Add Row

Add Row

Add Row

Add Row

ADD TWO ROWS

Add Row

Mercury	7439-97-6	6.2E-04	0.231	1.44E-04	1	24 hr	2nd ITSL	0.0%	PASS	7		
Nickel	7440-02-0	0.06	0.018	1.07E-03	0.006	annual	IRSL	17.8%	PASS	-		
Silver	7440-22-4	1.2E-03	0.468	5.40E-04	0.1	8 hr	ITSL	0.5%	PASS	-		
Thallium	7440-28-0	5.3E-03	0.018	9.41E-05	0.1	annual	ITSL	0.1%	PASS	-		Add Row
			0.468	2.47E-03	0.2	8 hr	2nd ITSL	1.2%	PASS			
Antimony	7440-36-0	4.3E-04	0.018	7.70E-06	0.2	annual	ITSL	0.0%	PASS	-		
Arsenic	7440-38-2	1.8E-03	0.018	3.21E-05	0.0002	annual	IRSL	16.0%	PASS	-		
Barium	7440-39-3	0.60	0.468	2.81E-01	5	8 hr	ITSL	5.6%	PASS	35		
Beryllium	7440-41-7	2.4E-08	0.231	5.43E-09	0.02	24 hr	ITSL	0.0%	PASS	-		Add Row
			0.018	4.19E-10	0.0004	annual	IRSL	0.0%	PASS			
Cadmium	7440-43-9	6.0E-04	0.018	1.07E-05	0.0006	annual	IRSL	1.8%	PASS	-		
Chromium	7440-47-3	1.8E-03	0.018	3.21E-05	0.5	annual	ITSL	0.0%	PASS	-	1308141	
Cobalt	7440-48-4	0.04	0.468	1.69E-02	0.2	8 hr	ITSL	8.4%	PASS	42		Add Row
		6.0E-03	0.018	1.07E-04	0.00013	annual	IRSL	82.3%	PASS		Annual avg	
Copper	7440-50-8	0.41	0.468	1.91E-01	2	8 hr	ITSL	9.6%	PASS	-		
Zinc	7440-66-6	0.43	0.468	2.02E-01	20	8 hr	ITSL	1.0%	PASS	C	1314132	
Ethylene	74-85-1	8.52	0.018	1.52E-01	6240	annual	ITSL	0.0%	PASS	-		
Acetaldehyde	75-07-0	1.72	0.018	3.06E-02	9	annual	ITSL	0.3%	PASS	-		Add Row
			0.018	3.06E-02	0.5	annual	IRSL	6.1%	PASS			
Hydrogen chloride	7647-01-0	14.25	0.018	2.54E-01	20	annual	ITSL	1.3%	PASS	13		Add Row
			0.728	1.04E+01	2100	1 hr	2nd ITSL	0.5%	PASS			
Phosphorus (yellow or white)	7723-14-0	2.88	0.231	6.64E-01	20	24 hr	ITSL	3.3%	PASS	32		
Selenium	7782-49-2	5.8E-03	0.468	2.70E-03	2	8 hr	ITSL	0.1%	PASS	34		
Methyl ethyl ketone	78-93-3	0.03	0.231	6.76E-03	5000	24 hr	ITSL	0.0%	PASS	-		
Acenaphthene	83-32-9	3.6E-03	0.018	6.46E-05	210	annual	ITSL	0.0%	PASS	-		
Phenanthrene	85-01-8	0.04	0.018	6.49E-04	0.1	annual	ITSL	0.6%	PASS	-		
Fluorene	86-73-7	0.02	0.018	3.42E-04	140	annual	ITSL	0.0%	PASS	-		
Naphthalene	91-20-3	0.61	0.018	1.08E-02	3	annual	ITSL	0.4%	PASS	-		ADD TWO ROWS
			0.468	2.85E-01	520	8 hr	2nd ITSL	0.1%	PASS			
			0.018	1.08E-02	0.08	annual	IRSL	13.5%	PASS			
2-Methyl Naphthalene	91-57-6	0.24	0.018	4.32E-03	10	annual	ITSL	0.0%	PASS	-		
3-Methylpentane	96-14-0	0.25	0.468	1.17E-01	3500	8 hr	ITSL	0.0%	PASS	-		
H2SO4	7664-93-9	1.92	0.018	3.42E-02	1	annual	ITSL	3.4%	PASS	9,13		Add Row
			0.728	1.40E+00	120	1 hr	2nd ITSL	1.2%	PASS			
Molybdenum	7439-98-7	2.2E-06	0.468	1.01E-06	30	8 hr	ITSL	0.0%	PASS	-		
Vanadium	1314-62-1	4.5E-06	0.728	3.28E-06	0.5	1 hr	ITSL	0.0%	PASS	-		
Ammonia	7664-41-7	6.3E-03	0.728	4.57E-03	350	1 hr	ITSL	0.0%	PASS	39		
Dichlorobenzene, mixed isomers	25321-22-6	2.4E-06										
1,2-dichlorobenzene	95-50-1	2.4E-06	0.018	4.19E-08	300	annual	ITSL	0.0%	PASS	-		
1,4-dichlorobenzene	106-46-7	2.4E-06	0.018	4.19E-08	800	annual	ITSL	0.0%	PASS	-		Add Row
			0.018	4.19E-08	0.25	annual	IRSL	0.0%	PASS			
1,3-dichlorobenzene	541-73-1	2.4E-06	0.018	4.19E-08	3	annual	ITSL	0.0%	PASS	-		

Polynuclear Aromatic Compounds with a Footnote of 5											PEF	
benzo(a)pyrene	50-32-8	2.23E-05	0.23	5.15E-06	0.002	24 hr	ITSL	0.3%	PASS	5	1	Add Row
dibenz(a,h)anthracene	53-70-3	1.52E-06								5	1.1	
3-methylcholanthrene	56-49-5	3.53E-09								5	5.7	
benz(a)anthracene	56-55-3	4.40E-04								5	0.1	
7,12-dimethylbenz(a)anthracene	57-97-6	3.14E-08								5	65	
dibenzo(a,i)pyrene	189-55-9	-								5	10	
dibenzo(a,h)pyrene	189-64-0	-								5	10	
dibenzo(a,l)pyrene	191-30-0	-								5	10	
dibenzo(a,e)pyrene	192-65-4	-								5	1	
Indeno(1,2,3-cd)pyrene	193-39-5	1.12E-05								5	0.1	
benzo(j)fluoranthene	205-82-3	-								5	0.1	
Benzo(b)fluoranthene	205-99-2	1.63E-04								5	0.1	
Benzo(k)fluoranthene	207-08-9	6.31E-05								5	0.1	
chrysene	218-01-9	9.79E-04								5	0.01	
5-methylchrysene	3697-24-3	-								5	1	
PAH TOTAL	50-32-8	0.00	0.23	2.39E-05	0.002	24 hr	ITSL	1.2%	PASS	5		Add Row
			0.02	1.85E-06	0.001	annual	IRSL	0.2%	PASS			

A-compared to SL for Benzo(a)pyrene, which is conservative as Benzo(e)pyrene is not carcinogenic

B-compared to SL for benzo(g,h,i)perylene

C-compared to SL for zinc oxide

D-sum of all dioxins and furans, including totals, which is conservative. Used annual average emission rate for annual SL.

E-Used annual average emission rate for annual SL.

EGLE Referenced Footnotes

1. The combined ambient impact of all petroleum hydrocarbon materials with Note #1 cannot exceed the ITSL of 3500 µg/m3 (8-hour average). If a chemical with this footnote has an ITSL other than 3,500 µg/m3, the ambient impact for that chemical also cannot exceed the chemical specific ITSL.

2. The combined ambient impact of all forms of xylene with Note #2 cannot exceed the initial threshold screening level (ITSL) of 390 µg/m3 (annual average).

5. The polycyclic aromatic hydrocarbons (PAHs) with this footnote are carcinogenic and have potency equivalency factors (PEFs) that quantitate their potency relative to that of benzo(a)pyrene (CAS# 50-32-8). Air emission mixtures of carcinogenic PAHs, including asphalt fumes, should be evaluated additively using these PEFs and the benzo(a)pyrene IRSL and SRSL. The ITSL for benzo(a)pyrene applies only to benzo(a)pyrene and none of the other PAHs.

7. Besides the assessment of mercury ambient air impacts in comparison to the ITSLs, larger individual sources of mercury emissions undergoing permit review (e.g., greater than 5 to 10 lbs/yr) may be evaluated on a case-by-case basis to

13. This chemical has two ITSLs with different averaging times. Ambient air impacts cannot exceed either ITSL. Both ITSLs also apply for determinations of permit to install exemptions under R 336.1290 (Rule 290).

22. The combined ambient impact of butane (CAS# 106-97-8) and isobutane (CAS# 75-28-5) should be evaluated together so that the combined impact does not exceed a hazard index value of one.

29. The ITSL for manganese is 0.3 µg/m3 with an annual averaging time. This ITSL is most appropriately applied to PM10-Mn or PM2.5-Mn data rather than TSP-Mn data. This ITSL applies to "manganese and manganese compounds," therefore emissions of multiple forms of manganese must be accounted for additively to ensure that the combined ambient air impact does not exceed the manganese ITSL. This ITSL applies to ambient air impacts of the manganese atom, therefore the emissions and modeled impacts of various manganese compounds may be molecular weight-adjusted to the equivalent emission rate and ambient air impact of the manganese alone. Please note that potassium permanganate (CAS# 7722-64-7) also has a short-term ITSL = 0.6 µg/m3 (8 hour averaging time).

32. The Chemical Abstract Service number (CAS#) has been changed to 12185-10-3. Since the original number 7723-14-0, is still used by many organizations, it is listed as the primary CAS#.

33. With regards to the health-based screening levels for tetrachlorodibenzo(p)dioxin (CAS# 1746-01-6), Rule 336.1225(6)(a) states that all polychlorinated dibenzodioxins and dibenzofurans shall be considered as one toxic air contaminant, expressed as an equivalent concentration of 2,3,7,8-tetrachlorodibenzo(p)dioxin based on the relative potency of the isomers emitted from the emission unit or units. The current toxic equivalency factors (TEFs) for use are those recommended by the World Health Organization (WHO, 2005), as provided in: Van den Berg, M. et al., 2006. The 2005 World Health Organization Reevaluation of Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-Like Compounds. Toxicological Sciences 93(2): 223-241.

34. The combined ambient impact of all selenium and inorganic selenium compounds with the CAS# 7446-08-4, 7446-34-6, 7488-56-4, 7783-00-8, 10102-18-8, and 13410-01-0 cannot exceed 2 µg/m3 (8-hour averaging time).

35. The combined ambient impact of all barium and soluble barium compounds with the CAS# 543-80-6, 1304-28-5, 10022-31-8, 10361-37-2, 10553-31-8, 13477-00-4, 13718-50-8, 17194-00-2, and 21109-95-5 cannot exceed 5 µg/m3 (8-hour averaging time).

Model Results Table

	1 hr	8 hr	24 hr	annual
Model Results	0.72758	0.46838	0.23057	0.01782

AQD_footnote	AQD_ITSL	AQD_Averaging_Time	AQD_Secondary_ITSL	AQD_Secondary_ITSL_Averaging_Time	AQD_IRSL	AQD_SRSL	AQD_Carcinogenicity_Averaging_Time
-	1000	24 hr	-	-	0.4	4	annual
#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
-	-	-	-	-	0.4	4	annual
-	4.4	8 hr	-	-	-	-	-
22	23800	8 hr	-	-	-	-	-
13	0.16	annual	5	1 hr	-	-	-
#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
-	5000	24 hr	-	-	-	-	-
-	17700	8 hr	-	-	-	-	-
-	700	annual	-	-	-	-	-
-	1760	8 hr	-	-	-	-	-
-	1000	annual	-	-	-	-	-
-	8	annual	-	-	-	-	-
-	7	annual	-	-	-	-	-
-	100	annual	-	-	-	-	-
2	390	annual	-	-	-	-	-
-	3500	8 hr	-	-	-	-	-
33	0.000002	annual	-	-	0.000000023	0.00000023	annual
#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
-	0.1	annual	-	-	0.000083	0.00083	annual
#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
-	13	annual	-	-	-	-	-
5	0.002	24 hr	-	-	0.001	0.01	annual
-	13	annual	-	-	-	-	-
-	140	annual	-	-	-	-	-
-	35	annual	-	-	-	-	-
-	9	1 hr	-	-	-	-	-
-	30	24 hr	-	-	0.08	0.8	annual
#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
5	0.002	24 hr	-	-	0.001	0.01	annual
#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
-	106	annual	-	-	-	-	-
1	3500	8 hr	-	-	-	-	-
-	800	annual	-	-	-	-	-
-	2	annual	-	-	-	-	-
-	5900	8 hr	-	-	-	-	-
-	30	annual	30	24 hr	0.1	1	annual
#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
-	6000	24 hr	-	-	-	-	-
29	0.3	annual	-	-	-	-	-
7	0.3	annual	1	24 hr	-	-	-

		Initial QC

Use rows for follow-up changes and QCs

	#N/A		#N/A		#N/A		#N/A		#N/A		#N/A	#N/A		#N/A
-		-		-		-		-			0.006	0.06	annual	
-			0.1	8 hr		-		-		-	-	-		
-			0.1	annual			0.2	8 hr		-	-	-		
	#N/A		#N/A		#N/A		#N/A		#N/A		#N/A	#N/A		#N/A
-			0.2	annual		-		-		-	-	-		
-		-		-		-		-			0.0002	0.002	annual	
35			5	8 hr		-		-		-	-	-		
-			0.02	24 hr		-		-			0.0004	0.004	annual	
	#N/A		#N/A		#N/A		#N/A		#N/A		#N/A	#N/A		#N/A
-		-		-		-		-			0.0006	0.006	annual	
-			0.5	annual		-		-		-	-	-		
42			0.2	8 hr		-		-			0.00013	0.0013	annual	
	#N/A		#N/A		#N/A		#N/A		#N/A		#N/A	#N/A		#N/A
-			2	8 hr		-		-		-	-	-		
-			20	8 hr		-		-		-	-	-		
-			6240	annual		-		-		-	-	-		
-			9	annual		-		-			0.5	5	annual	
	#N/A		#N/A		#N/A		#N/A		#N/A		#N/A	#N/A		#N/A
13			20	annual			2100	1 hr		-	-	-		
	#N/A		#N/A		#N/A		#N/A		#N/A		#N/A	#N/A		#N/A
32			20	24 hr		-		-		-	-	-		
34			2	8 hr		-		-		-	-	-		
-			5000	24 hr		-		-		-	-	-		
-			210	annual		-		-		-	-	-		
-			0.1	annual		-		-		-	-	-		
-			140	annual		-		-		-	-	-		
-			3	annual			520	8 hr			0.08	0.8	annual	
	#N/A		#N/A		#N/A		#N/A		#N/A		#N/A	#N/A		#N/A
	#N/A		#N/A		#N/A		#N/A		#N/A		#N/A	#N/A		#N/A
-			10	annual		-		-		-	-	-		
-			3500	8 hr		-		-		-	-	-		
9,13			1	annual			120	1 hr		-	-	-		
-			30	8 hr		-		-		-	-	-		
-			0.5	1 hr		-		-		-	-	-		
39			350	1 hr		-		-		-	-	-		
	#N/A		#N/A		#N/A		#N/A		#N/A		#N/A	#N/A		#N/A
-			300	annual		-		-		-	-	-		
-			800	annual		-		-			0.25	2.5	annual	
	#N/A		#N/A		#N/A		#N/A		#N/A		#N/A	#N/A		#N/A
-			3	annual		-		-		-	-	-		

5		0.002	24 hr	-	-		0.001	0.01	annual	
5	-		-	-	-	-	-		annual	
5	-		-	-	-	-	-		-	
5	-		-	-	-	-	-		annual	
5	-		-	-	-	-	-		-	
5	-		-	-	-	-	-		annual	
5	-		-	-	-	-	-		annual	
5	-		-	-	-	-	-		annual	
5	-		-	-	-	-	-		annual	
5	-		-	-	-	-	-		-	
5	-		-	-	-	-	-		annual	
5	-		-	-	-	-	-		annual	
5	-		-	-	-	-	-		annual	
5	-		-	-	-	-	-		annual	
5	-		-	-	-	-	-		annual	
5		0.002	24 hr	-	-		0.001	0.01	annual	
	#N/A	#N/A	#N/A		#N/A	#N/A	#N/A	#N/A		#N/A

AIR DISPERSION ANALYSIS SUMMARY
STRATEGY DEVELOPMENT UNIT, AIR QUALITY DIVISION
MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

Ajax Materials
Carpenter Road and Energy Drive ,Genesee Charter Township
20210019 **/** P1771

To:	Amber Brown , Permit Section	**Completed On:**	6/30/2021	**Rev:**	-
From:	Stephanie Hengesbach , Strategy Development Unit	**Date Received:**	4/16/2021		

MODEL INFORMATION

MET STN	Flint
UPPER:	White Lake
ABBR:	FNT19
ANEM HT:	10.06
MODEL:	AERMOD
LAND :	RURAL
DWASH:	Yes
TERRAIN	Yes

Modelers Comments:

Updated Modeling:

Modeling was redone to assume different pile locations at the facility. Several scenarios were performed, and the final analysis was done with two large area sources; one representing the larger pile with emissions from the pile only being considered when wind speeds are greater than 11.5 mph, and the second area source represents yard emissions including smaller piles and truck traffic associated with transporting to and from those piles (traffic emissions from this location happen less frequently than the roads and associated emissions input into the model). This modeling analysis showed all criteria pollutants meet the required PSD and/or NAAQS levels.

The stack location was also updated at the facility. The updated criteria pollutant modeling accounted for the new location and the generic TAC analysis was redone as well.

All modeled parameters, emission rates, and impacts are attached.

Updated Modeling 5/18/21:

The permit engineer provided updated short-term emissions from the pile for both PM10 and PM2.5. Modeling for PM10 and PM2.5 was redone to account for the emission rate change. With the pile emission rate increase, impacts of both pollutants still meet associated PSD and/or NAAQS limits.

Original Report 5/5/21:

Modeling for the Ajax facility was requested to evaluate NOx, PM2.5, PM10, SO2, and TAC impacts from the proposed new HMA plant. Criteria and TAC modeling both considered the most recent year (2019) of one-minute adjusted u-star meteorological data from the Bishop International Airport (FNT). Since only one met year was modeled in the criteria pollutant analysis, the maximum impact was used for comparison against the SIL, PSD Increment, and NAAQS for all pollutants and averaging times.

Since this is a proposed new facility, all sources were included in SIL, PSD Increment, and NAAQS modeling. For NOx and SO2 emissions originate from the HMA Counterflow Drum Dryer stack. PM10 and PM2.5 modeling was performed with emissions from the Drum Dryer stack, but also from fugitives associated with a pile and two unpaved roads (one road representing emissions from front end loader traffic and the second representing emissions from truck traffic).

Modeling showed impacts for all criteria pollutants were greater than Significant Impact Levels (SILs), therefore, further PSD and/or NAAQS modeling was performed. A search did not result in any nearby sources that need to be included in PSD Increment modeling, however, one additional SO2 source was found and included in SO2 NAAQS modeling. NOx modeling was performed with a Tier I analysis assuming NOx is equal to NO2; this is a conservative assumption.

As mentioned above, only one year was modeled for criteria pollutants. PSD Increment modeling was performed for annual NOx, both averaging times of PM10 and PM2.5, and for annual, 3-hour, and 24-hour NOx. All pollutants resulted in impacts below allowed PSD Increments. NAAQS modeling was done for annual and 1-hour NOx, 24-hour PM10, annual and 24-hour PM2.5, and 1-hour and 3-hour SO2. One additional source was included in the SO2 model and background concentrations of each pollutant were added to modeled impacts. Cumulative results of all pollutants and averaging times were below NAAQS limits.

Generic TAC modeling was run for the Drum Dryer stack with an emission rate of 1 lb/hr. To calculate TAC impacts, pollutant emission rates, in lb/hr, can be multiplied by the associated averaging times generic impact. The generic TAC impacts from the Drum Dryer stack were passed on to the permit engineer for the formal review.

Stack parameters, emission rates and impacts for all modeling is attached to this report.

Company: Ajax Materials Corporation
SRN: P1771
Application: 2021-0019
Engineer: Ambrosia Brown
Modeler: Stephanie Hengesbach
Date: 6/21/2021

Significance Modeling - Impacts in ug/m3

(all impacts are first high)

Pollutant	Ave. Period	2019 Max Impact	Significant Impact Level	Below SIL?
NO2	1-hr	52.48	7.5	No
	annual	1.29	1	No
PM10	24-hr	28.48	5	No
	annual	4.13	1	No
PM2.5	24-hr	8.44	1.2	No
	annual	0.94	0.2	No
SO2	1-hr	77.70	7.8	No
	3-hr	63.22	25	No
	24-hr	24.61	5	No
	annual	1.90	1	No

PSD Modeling - Impacts in ug/m3

(all impacts are first high)

Pollutant	Ave. Period	2019 Max Impact	PSD Increment	% of Increment
NO2	annual	1.29	25	5.1%
PM10	24-hr	28.48	30	95%
	annual	4.13	17	24%
PM2.5	24-hr	8.44	9	94%
	annual	0.94	4	23%
SO2	3-hr	63.22	512	12%
	24-hr	24.61	91	27%
	annual	1.90	20	10%

NAAQS Modeling - Impacts in ug/m3

(all impacts are first high)

Pollutant	Ave. Period	2019 Max Impact	Background	Combined Impact	NAAQS	% of NAAQS
NO2	1-hr	52.48	69.2	121.68	188	64.72%
	annual	1.29	12.2	13.49	100	13.49%
PM10	24-hr	28.48	35.0	63.48	150	42.32%
PM2.5	24-hr	8.44	17.1	25.54	35	72.98%
	annual	0.94	7.1	8.04	12	67.00%
SO2	3-hr	63.22	10.2	73.42	1300	5.65%
	1-hr	77.70	10.7	88.40	196	45.10%

Company: Ajax Materials Corporation
SRN: P1771
Application: 2021-0019
Engineer: Ambrosia Brown
Modeler: Stephanie Hengesbach
Date: 6/11/2021

Stack	Modeled Impacts per Stack			
	Generic 1 lb/hr			
	annual	1-hr	8-hr	24-hr
STACK	0.01780	0.72682	0.46749	0.23023

Generic TAC Stack Parameters

Type	ID	Height	Diameter	Exit Velocity	Exit Temp	Release Type	Emission Rate	X1	Y1
		ft	in	ft/sec	F		lb/hr	[m]	[m]
POINT	STACK	80	68	66.1	300	VERTICAL	1.0	282836.39	4772990.96

NOx and SO2 Stack Parameters and Emission Rates

Type	ID	Height	Diameter	Exit Velocity	Exit Temp	Release Type	**NOx** Emission Rate	**SO2** Emission Rate	X1
		ft	in	ft/sec	F		lb/hr	lb/hr	[m]
POINT	STACK	80	68	66.1	300	VERTICAL	72.2	106.9	282836.39
POINT	N3570*	220	94	69.2	337	VERTICAL	-	4.8	282670.00

***Additional Source only for SO2 analysis**

X2	Y2	X3	Y3	X4	Y4	
[m]	[m]	[m]	[m]	[m]	[m]	

Y1	X3	Y3	X4	Y4		
[m]	[m]	[m]	[m]	[m]		
4772990.96						
4773725.00						

PM10 and PM2.5 Stack Parameters and Emission Ra

Type	ID	Height	Diameter	Exit Velocity	Exit Temp	Release Type	Sigma Y	Sigma Z	Length X
		ft	in	ft/sec	F		[m]	[m]	ft
POINT	STACK	80	68	66.1	300	VERTICAL			
AREA	YARDP	10							656.17
AREA	**PILE***	10							656.17
***PILE emissions are only included when the wind is greater that 5.14 m/sec (11.5 mph).**									
This was applied by using Variable Emission Factors by Wind Speed within AERMOD.									
VOLUME	PAF_0001	11.475					5.343	3.254	75.37
VOLUME	PAF_0002	11.475					5.343	3.254	75.37
VOLUME	PAF_0003	11.475					5.343	3.254	75.37
VOLUME	PAF_0004	11.475					5.343	3.254	75.37
VOLUME	PAF_0005	11.475					5.343	3.254	75.37
VOLUME	PAF_0006	11.475					5.343	3.254	75.37
VOLUME	PAF_0007	11.475					5.343	3.254	75.37
VOLUME	PAF_0008	11.475					5.343	3.254	75.37
VOLUME	PAF_0009	11.475					5.343	3.254	75.37
VOLUME	PAE_0001	11.475					5.343	3.254	75.37
VOLUME	PAE_0002	11.475					5.343	3.254	75.37
VOLUME	PAE_0003	11.475					5.343	3.254	75.37
VOLUME	PAE_0004	11.475					5.343	3.254	75.37
VOLUME	PAE_0005	11.475					5.343	3.254	75.37
VOLUME	PAE_0006	11.475					5.343	3.254	75.37
VOLUME	PAE_0007	11.475					5.343	3.254	75.37
VOLUME	PAE_0008	11.475					5.343	3.254	75.37
VOLUME	PAE_0009	11.475					5.343	3.254	75.37
VOLUME	PAE_0010	11.475					5.343	3.254	75.37
VOLUME	PAE_0011	11.475					5.343	3.254	75.37
VOLUME	PAE_0012	11.475					5.343	3.254	75.37
VOLUME	PAE_0013	11.475					5.343	3.254	75.37
VOLUME	PAE_0014	11.475					5.343	3.254	75.37
VOLUME	PAE_0015	11.475					5.343	3.254	75.37
VOLUME	PAE_0016	11.475					5.343	3.254	75.37
VOLUME	PAE_0017	11.475					5.343	3.254	75.37
VOLUME	PAE_0018	11.475					5.343	3.254	75.37
VOLUME	PAE_0019	11.475					5.343	3.254	75.37
VOLUME	PAE_0020	11.475					5.343	3.254	75.37
VOLUME	PAE_0021	11.475					5.343	3.254	75.37
VOLUME	PAE_0022	11.475					5.343	3.254	75.37
VOLUME	PAE_0023	11.475					5.343	3.254	75.37
VOLUME	PAE_0024	11.475					5.343	3.254	75.37
VOLUME	PAE_0025	11.475					5.343	3.254	75.37
VOLUME	PAE_0026	11.475					5.343	3.254	75.37
VOLUME	PAE_0027	11.475					5.343	3.254	75.37
VOLUME	PAE_0028	11.475					5.343	3.254	75.37
VOLUME	PAE_0029	11.475					5.343	3.254	75.37
VOLUME	PAE_0030	11.475					5.343	3.254	75.37
VOLUME	PAE_0031	11.475					5.343	3.254	75.37

VOLUME	PAE_0032	11.475	5.343	3.254	75.37
VOLUME	PAE_0033	11.475	5.343	3.254	75.37
VOLUME	PAE_0034	11.475	5.343	3.254	75.37
VOLUME	PAE_0035	11.475	5.343	3.254	75.37
VOLUME	PAE_0036	11.475	5.343	3.254	75.37
VOLUME	PAE_0037	11.475	5.343	3.254	75.37
VOLUME	PAE_0038	11.475	5.343	3.254	75.37
VOLUME	PAE_0039	11.475	5.343	3.254	75.37
VOLUME	PAE_0040	11.475	5.343	3.254	75.37
VOLUME	PAE_0041	11.475	5.343	3.254	75.37
VOLUME	PAE_0042	11.475	5.343	3.254	75.37

VOLUME	APS_0001	11.475	5.343	3.254	75.37
VOLUME	APS_0002	11.475	5.343	3.254	75.37
VOLUME	APS_0003	11.475	5.343	3.254	75.37
VOLUME	APS_0004	11.475	5.343	3.254	75.37
VOLUME	APS_0005	11.475	5.343	3.254	75.37
VOLUME	APS_0006	11.475	5.343	3.254	75.37
VOLUME	APS_0007	11.475	5.343	3.254	75.37
VOLUME	APS_0008	11.475	5.343	3.254	75.37
VOLUME	APS_0009	11.475	5.343	3.254	75.37
VOLUME	APS_0010	11.475	5.343	3.254	75.37
VOLUME	APS_0011	11.475	5.343	3.254	75.37
VOLUME	APS_0012	11.475	5.343	3.254	75.37
VOLUME	APS_0013	11.475	5.343	3.254	75.37
VOLUME	APS_0014	11.475	5.343	3.254	75.37
VOLUME	APS_0015	11.475	5.343	3.254	75.37
VOLUME	APS_0016	11.475	5.343	3.254	75.37
VOLUME	APS_0017	11.475	5.343	3.254	75.37
VOLUME	APS_0018	11.475	5.343	3.254	75.37
VOLUME	APS_0019	11.475	5.343	3.254	75.37
VOLUME	APS_0020	11.475	5.343	3.254	75.37
VOLUME	APS_0021	11.475	5.343	3.254	75.37
VOLUME	APS_0022	11.475	5.343	3.254	75.37
VOLUME	APS_0023	11.475	5.343	3.254	75.37
VOLUME	APS_0024	11.475	5.343	3.254	75.37
VOLUME	APS_0025	11.475	5.343	3.254	75.37
VOLUME	APS_0026	11.475	5.343	3.254	75.37
VOLUME	APS_0027	11.475	5.343	3.254	75.37
VOLUME	APS_0028	11.475	5.343	3.254	75.37
VOLUME	APS_0029	11.475	5.343	3.254	75.37
VOLUME	APS_0030	11.475	5.343	3.254	75.37
VOLUME	APS_0031	11.475	5.343	3.254	75.37
VOLUME	APS_0032	11.475	5.343	3.254	75.37
VOLUME	APS_0033	11.475	5.343	3.254	75.37
VOLUME	APS_0034	11.475	5.343	3.254	75.37
VOLUME	APS_0035	11.475	5.343	3.254	75.37
VOLUME	APS_0036	11.475	5.343	3.254	75.37
VOLUME	APS_0037	11.475	5.343	3.254	75.37
VOLUME	APS_0038	11.475	5.343	3.254	75.37
VOLUME	APS_0039	11.475	5.343	3.254	75.37
VOLUME	APS_0040	11.475	5.343	3.254	75.37

VOLUME	APS_0041	11.475	5.343	3.254	75.37
VOLUME	APS_0042	11.475	5.343	3.254	75.37
VOLUME	APS_0043	11.475	5.343	3.254	75.37
VOLUME	APS_0044	11.475	5.343	3.254	75.37
VOLUME	FEL_0001	11.407	4.456	3.234	62.87
VOLUME	FEL_0002	11.407	4.456	3.234	62.87
VOLUME	FEL_0003	11.407	4.456	3.234	62.87
VOLUME	FEL_0004	11.407	4.456	3.234	62.87
VOLUME	FEL_0005	11.407	4.456	3.234	62.87
VOLUME	FEL_0006	11.407	4.456	3.234	62.87
VOLUME	FEL_0007	11.407	4.456	3.234	62.87
VOLUME	FEL_0008	11.407	4.456	3.234	62.87
VOLUME	FEL_0009	11.407	4.456	3.234	62.87
VOLUME	FEL_0010	11.407	4.456	3.234	62.87
VOLUME	FEL_0011	11.407	4.456	3.234	62.87
VOLUME	FEL_0012	11.407	4.456	3.234	62.87
VOLUME	FEL_0013	11.407	4.456	3.234	62.87
VOLUME	FEL_0014	11.407	4.456	3.234	62.87
VOLUME	FEL_0015	11.407	4.456	3.234	62.87
VOLUME	FEL_0016	11.407	4.456	3.234	62.87
VOLUME	FEL_0017	11.407	4.456	3.234	62.87
VOLUME	FEL_0018	11.407	4.456	3.234	62.87
VOLUME	FEL_0019	11.407	4.456	3.234	62.87
VOLUME	FEL_0020	11.407	4.456	3.234	62.87
VOLUME	FEL_0021	11.407	4.456	3.234	62.87
VOLUME	FEL_0022	11.407	4.456	3.234	62.87
VOLUME	FEL_0023	11.407	4.456	3.234	62.87
VOLUME	FEL_0024	11.407	4.456	3.234	62.87
VOLUME	FEL_0025	11.407	4.456	3.234	62.87
VOLUME	FEL_0026	11.407	4.456	3.234	62.87
VOLUME	FEL_0027	11.407	4.456	3.234	62.87
VOLUME	FEL_0028	11.407	4.456	3.234	62.87
VOLUME	FEL_0029	11.407	4.456	3.234	62.87
VOLUME	FEL_0030	11.407	4.456	3.234	62.87
VOLUME	FEL_0031	11.407	4.456	3.234	62.87
VOLUME	FEL_0032	11.407	4.456	3.234	62.87
VOLUME	FEL_0033	11.407	4.456	3.234	62.87
VOLUME	FEL_0034	11.407	4.456	3.234	62.87
VOLUME	FEL_0035	11.407	4.456	3.234	62.87
VOLUME	FEL_0036	11.407	4.456	3.234	62.87
VOLUME	FEL_0037	11.407	4.456	3.234	62.87
VOLUME	FEL_0038	11.407	4.456	3.234	62.87
VOLUME	FEL_0039	11.407	4.456	3.234	62.87
VOLUME	FEL_0040	11.407	4.456	3.234	62.87
VOLUME	FEL_0041	11.407	4.456	3.234	62.87
VOLUME	FEL_0042	11.407	4.456	3.234	62.87
VOLUME	FEL_0043	11.407	4.456	3.234	62.87
VOLUME	FEL_0044	11.407	4.456	3.234	62.87
VOLUME	FEL_0045	11.407	4.456	3.234	62.87
VOLUME	FEL_0046	11.407	4.456	3.234	62.87
VOLUME	FEL_0047	11.407	4.456	3.234	62.87

VOLUME	FEL_0048	11.407	4.456	3.234	62.87
VOLUME	FEL_0049	11.407	4.456	3.234	62.87
VOLUME	FEL_0050	11.407	4.456	3.234	62.87
VOLUME	FEL_0051	11.407	4.456	3.234	62.87
VOLUME	FEL_0052	11.407	4.456	3.234	62.87
VOLUME	FEL_0053	11.407	4.456	3.234	62.87
VOLUME	FEL_0054	11.407	4.456	3.234	62.87
VOLUME	FEL_0055	11.407	4.456	3.234	62.87

tes - Verified from Tbl 7 Model Input

Length Y	**PM10** Emission Rate	**PM10** Emission Rate	**PM2.5** Emission Rate	**PM2.5** Emission Rate	PM10 Emission Rate	PM2.5 Emission Rate	X1
ft	g/sec	lb/hr	g/sec	lb/hr	g/sec/m2	g/sec/m2	[m]
	4.297	34.1	4.297	34.1			282836.39
656.17	**7.29E-03**	0.05786	**1.64E-03**	0.01302	1.823E-07	4.10E-08	282960.00
656.17	**2.79E-01**	2.21432	**2.79E-02**	0.221432	6.975E-06	6.98E-07	282772.29
	PM10/PM2.5 Emissions Updated 6-18-21						
	2.13E-04		5.24E-05				
	2.13E-04		5.24E-05				
	2.13E-04		5.24E-05				
	2.13E-04		5.24E-05				
	2.13E-04		5.24E-05				
	2.13E-04		5.24E-05				
	2.13E-04		5.24E-05				
	2.13E-04		5.24E-05				
	2.13E-04		5.24E-05				
	8.27E-05		2.03E-05				
	8.27E-05		2.03E-05				
	8.27E-05		2.03E-05				
	8.27E-05		2.03E-05				
	8.27E-05		2.03E-05				
	8.27E-05		2.03E-05				
	8.27E-05		2.03E-05				
	8.27E-05		2.03E-05				
	8.27E-05		2.03E-05				
	8.27E-05		2.03E-05				
	8.27E-05		2.03E-05				
	8.27E-05		2.03E-05				
	8.27E-05		2.03E-05				
	8.27E-05		2.03E-05				
	8.27E-05		2.03E-05				
	8.27E-05		2.03E-05				
	8.27E-05		2.03E-05				
	8.27E-05		2.03E-05				
	8.27E-05		2.03E-05				
	8.27E-05		2.03E-05				
	8.27E-05		2.03E-05				
	8.27E-05		2.03E-05				
	8.27E-05		2.03E-05				
	8.27E-05		2.03E-05				
	8.27E-05		2.03E-05				
	8.27E-05		2.03E-05				
	8.27E-05		2.03E-05				
	8.27E-05		2.03E-05				
	8.27E-05		2.03E-05				
	8.27E-05		2.03E-05				
	8.27E-05		2.03E-05				

8.27E-05	2.03E-05
8.27E-05	2.03E-05
8.27E-05	2.03E-05
8.27E-05	2.03E-05
8.27E-05	2.03E-05
8.27E-05	2.03E-05
8.27E-05	2.03E-05
8.27E-05	2.03E-05
8.27E-05	2.03E-05
8.27E-05	2.03E-05
8.27E-05	2.03E-05
2.67E-04	6.56E-05
2.67E-04	6.56E-05
2.67E-04	6.56E-05
2.67E-04	6.56E-05
2.67E-04	6.56E-05
2.67E-04	6.56E-05
2.67E-04	6.56E-05
2.67E-04	6.56E-05
2.67E-04	6.56E-05
2.67E-04	6.56E-05
2.67E-04	6.56E-05
2.67E-04	6.56E-05
2.67E-04	6.56E-05
2.67E-04	6.56E-05
2.67E-04	6.56E-05
2.67E-04	6.56E-05
2.67E-04	6.56E-05
2.67E-04	6.56E-05
2.67E-04	6.56E-05
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2.67E-04	6.56E-05
2.67E-04	6.56E-05
2.67E-04	6.56E-05
2.67E-04	6.56E-05
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2.67E-04	6.56E-05
2.67E-04	6.56E-05
2.67E-04	6.56E-05
2.67E-04	6.56E-05
2.67E-04	6.56E-05
2.67E-04	6.56E-05
2.67E-04	6.56E-05

2.67E-04	6.56E-05
2.67E-04	6.56E-05
2.67E-04	6.56E-05
2.67E-04	6.56E-05
4.47E-04	4.47E-05
4.47E-04	4.47E-05
4.47E-04	4.47E-05
4.47E-04	4.47E-05
4.47E-04	4.47E-05
4.47E-04	4.47E-05
4.47E-04	4.47E-05
4.47E-04	4.47E-05
4.47E-04	4.47E-05
4.47E-04	4.47E-05
4.47E-04	4.47E-05
4.47E-04	4.47E-05
4.47E-04	4.47E-05
4.47E-04	4.47E-05
4.47E-04	4.47E-05
4.47E-04	4.47E-05
4.47E-04	4.47E-05
4.47E-04	4.47E-05
4.47E-04	4.47E-05
4.47E-04	4.47E-05
4.47E-04	4.47E-05
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4.47E-04	4.47E-05
4.47E-04	4.47E-05
4.47E-04	4.47E-05
4.47E-04	4.47E-05
4.47E-04	4.47E-05
4.47E-04	4.47E-05
4.47E-04	4.47E-05
4.47E-04	4.47E-05
4.47E-04	4.47E-05
4.47E-04	4.47E-05
4.47E-04	4.47E-05
4.47E-04	4.47E-05
4.47E-04	4.47E-05
4.47E-04	4.47E-05
4.47E-04	4.47E-05
4.47E-04	4.47E-05
4.47E-04	4.47E-05
4.47E-04	4.47E-05
4.47E-04	4.47E-05
4.47E-04	4.47E-05
4.47E-04	4.47E-05

4.47E-04	4.47E-05
4.47E-04	4.47E-05
4.47E-04	4.47E-05
4.47E-04	4.47E-05
4.47E-04	4.47E-05
4.47E-04	4.47E-05
4.47E-04	4.47E-05
4.47E-04	4.47E-05

Y1	X2	Y2	X3	Y3	X4	Y4
[m]	[m]	[m]	[m]	[m]	[m]	[m]
4772990.96						
4772988.00						
4773013.93						

Table 6 – Structure Heights

Air Permit to Install

Ajax Materials, Genesee Twp, Michigan

Structure ID in Model	Height (ft)
CTRL_BLD	24
AC_Tank1	40
AC_Tank2	40
AC_Tank3	40
AC_Tank4	40
AC_Tank5	40
AC_Tank6	40
RUO_Tank	40

Note: This table represents the structures for which the stack is located within the downwash area of the structure ("5L"). Other equipment onsite is elevated and does not obstruct air flow; elevated equipment was not included in the model.

Refer to the model for identification of each structure.

Brown, Ambrosia (EGLE)

From:	Brown, Ambrosia (EGLE)
Sent:	Tuesday, March 16, 2021 2:51 PM
To:	Jarrett, Stephanie
Cc:	McGeen, Dan (EGLE); Mitchell, Mark (EGLE); Magirl, Lauren (EGLE)
Subject:	RE: Ajax Paving

Stephanie,

Unrelated to the reason I asked to arrange a call with the company:

As you know, I am in the process of reviewing the Ajax application. Since this is a new facility, all construction initially going in could be considered part of the same project. Since the project is greater than significance, then no exemptions can be used. That means even a space heater would need to be included (also, are they planning to add a pre-heater for processing RAP?). I want to confirm that we are including everything that we need to.

When screening for toxics, we need to review all of the toxics from the project added together. It appears that you screened using the AER table for the miscellaneous equipment separately than the drum which was modeled. If all of the emissions added together pass AER, then modeling is not needed. Otherwise we would assume the worst-case stack if we were going to model, assuming fugitives are exhausted out of the stack if appropriate.

Likewise with the NAAQS and Increment as the total criteria pollutants from the project should be reviewed and not just the ones from the drum.

I also am not seeing emission calculations for any fugitive sources of emissions like traffic, tank/silos fumes, and loadout. I believe the fugitive emissions from the elevators are included in the AP-42 emission factors. Some of the methods for calculating these emissions are in AP-42. These emissions should also be included in the NAAQS/Increment/toxics review as appropriate.

Ambrosia Brown, P.E.
Environmental Engineer
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From: Jarrett, Stephanie <sajarrett@fishbeck.com>
Sent: Thursday, March 4, 2021 2:38 PM

To: Brown, Ambrosia (EGLE) <BrownA39@michigan.gov>
Subject: RE: Ajax Paving

Sorry about that! Please see attached.

Thanks,
Stephanie

Stephanie A. Jarrett, P.E. | Senior Environmental Engineer
Fishbeck | w: 248.324.2146 | c: 248.417.9425| Fishbeck.com

From: Brown, Ambrosia (EGLE) <BrownA39@michigan.gov>
Sent: Thursday, March 04, 2021 2:13 PM
To: Jarrett, Stephanie <sajarrett@fishbeck.com>
Subject: RE: Ajax Paving

Stephanie,

I went to check the calculations but it looks like I did not receive the excel spreadsheet version. Can you please send the spreadsheets for AJAX? Thank you.

Ambrosia Brown, P.E.
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From: Jarrett, Stephanie <sajarrett@fishbeck.com>
Sent: Monday, March 1, 2021 3:54 PM
To: Brown, Ambrosia (EGLE) <BrownA39@michigan.gov>
Subject: Ajax Paving

Hi Ambrosia – I hope your doing well. Do you have any updates on the Ajax Paving HMA Plant PTI Application? Let me know if I can answer any questions for you.

Thanks,
Stephanie

Stephanie A. Jarrett, P.E. | Senior Environmental Engineer
Fishbeck | w: 248.324.2146 | c: 248.417.9425| Fishbeck.com

Brown, Ambrosia (EGLE)

From:	Brown, Ambrosia (EGLE)
Sent:	Friday, May 28, 2021 10:40 AM
To:	Kuieck, Sue; McGeen, Dan (EGLE); Myott, Brad (EGLE); Jarrett, Stephanie; mboden@ajaxpaving.com; kanderson@ajaxpaving.com; dgrabowski@ajaxpaving.com; kkissling@wnj.com
Cc:	Mitchell, Mark (EGLE)
Subject:	RE: Ajax 24-hour PM10 impacts
Attachments:	PTI APP-2021-0019 R5.docx

I have attached the clean version of the draft with the changes discussed this morning.

I would like to point out that the daily limit could just be 12,000 tons/day rather than a having to calculate an hourly average on a daily basis or we can keep with the 500 tons per hour average if you prefer.

Of course the language related to the stockpile setback distance is subject to change/negotiation as discussed.

Thank you.

Ambrosia Brown, P.E.
Environmental Engineer
Air Quality Division - Permit Section
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From: Kuieck, Sue <slkuieck@fishbeck.com>
Sent: Friday, May 28, 2021 10:21 AM
To: Brown, Ambrosia (EGLE) <BrownA39@michigan.gov>; McGeen, Dan (EGLE) <MCGEEND@michigan.gov>; Myott, Brad (EGLE) <MYOTTB@michigan.gov>; Jarrett, Stephanie <sajarrett@fishbeck.com>; mboden@ajaxpaving.com; kanderson@ajaxpaving.com; dgrabowski@ajaxpaving.com; kkissling@wnj.com
Cc: Mitchell, Mark (EGLE) <MITCHELLM7@michigan.gov>
Subject: RE: Ajax 24-hour PM10 impacts

Thanks Ambrosia!

Attached are the revised emission calculations and model impacts for the change in the concentration of HCl. I'll get with Stephanie when she gets back on Tuesday to discuss the modeling.

Have a great weekend!

Sue Kuieck | Air Quality Engineer
Fishbeck | w: 616.464.3721 | c: 616.446.2496 | Fishbeck.com

From: Brown, Ambrosia (EGLE) <BrownA39@michigan.gov>
Sent: Friday, May 28, 2021 9:36 AM
To: McGeen, Dan (EGLE) <MCGEEND@michigan.gov>; Myott, Brad (EGLE) <MYOTTB@michigan.gov>; Jarrett, Stephanie <sajarrett@fishbeck.com>; mboden@ajaxpaving.com; kanderson@ajaxpaving.com; dgrabowski@ajaxpaving.com; kkissling@wnj.com; Kuieck, Sue <slkuieck@fishbeck.com>
Cc: Mitchell, Mark (EGLE) <MITCHELLM7@michigan.gov>
Subject: FW: Ajax 24-hour PM10 impacts

EXTERNAL EMAIL

I am forwarding the email from Stephanie about the modeling which we discussed this morning.

Ambrosia Brown, P.E.
Environmental Engineer
Air Quality Division - Permit Section
Michigan Department of Environment, Great Lakes, and Energy (EGLE)
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From: Hengesbach, Stephanie (EGLE) <HENGESBACHS1@michigan.gov>
Sent: Thursday, May 27, 2021 9:30 PM
To: Brown, Ambrosia (EGLE) <BrownA39@michigan.gov>; Mitchell, Mark (EGLE) <MITCHELLM7@michigan.gov>
Subject: Ajax 24-hour PM10 impacts

Hi Ambrosia,

Attached is a spread sheet showing the Ajax impacts with the original design and also impacts with moving the pile towards the west property and the stack. I also have individual stack impacts. Impacts with 'Pile' represent the original location and impacts with 'Pile2' the updated location towards the rest property. Impacts are quite a bit higher when moving the pile towards the west property.

I'll check email tomorrow morning before 8 am so send me an email if you want to talk about my modeling before your 8 am meeting. I'd have time to talk.

Let me know if you have questions.

Stephanie

Stephanie M. Hengesbach
Meteorologist
Air Quality Division
Michigan Department of Environment, Great Lakes, and Energy
NEW Work Cell 517-648-7015 | hengesbachs1@michigan.gov
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