Maricopa County
Air Quality Department

NON-TITLE V
TECHNICAL SUPPORT DOCUMENT

PERMIT NUMBER:	090234	**App. ID(s):**	408707
BUSINESS NAME:	VULCAN MATERIALS COMPANY AVONDALE PLANT	**Revision(s):**	1.0.0.0
SOURCE TYPE:	Asphalt Plant, Crushing and Screening	**Revision Type(s):**	Renewal
PERMIT ENGINEER:	Casey Bryan	**Date Prepared:**	12/11/2015

BACT: Yes **MACT:** No **NSPS:** Yes **SYNTH MINOR:** No **AIRS:** No

DUST PLAN REQUIRED: Yes **DUST PLAN RECEIVED:** Yes, Submitted 09/03/2014

O&M PLAN REQUIRED: Yes **O&M PLAN RECEIVED:** Yes, Submitted 09/03/2014

PORTABLE SOURCE: No **SITE VISIT: 01/27/2016**

PROCESS DESCRIPTION:
The Vulcan Materials Company-Avondale Plant is a nonmetallic mineral processing plant that also has a continuous (non-batch) hot mix asphalt plant located on 165 acres of disturbed surface area. The site is in shutdown status but may have loadout of existing stock on occasion.

Mineral Processing Plant:
Per MCAQD Rule 316 the definition of non-metallic mineral processing plant is any facility utilizing any combination of equipment or machinery that is used to mine, excavate, separate, combine, crush, or grind any nonmetallic mineral including, but not limited to, lime plants, coal fired power plants, steel mills, asphalt plants, concrete plants, Portland cement plants, raw material storage and distribution, and sand and gravel plants. Rock Product Processing Plants are included in this definition. Techniques used for extraction vary with the nature and location of the deposit. Processing operations may include crushing, screening, size classification, material handling and storage operations. All of these processes can be significant sources of PM and PM-10 emissions if uncontrolled. The mineral processing plant is regulated by MCAQD Rule 316 and 40 CFR 60 Subpart OOO.

Hot Mix Plant:
Hot mix asphalt (HMA) paving materials are a mixture of size-graded, high quality aggregate (which can include reclaimed asphalt pavement [RAP]), and liquid asphalt cement, which is heated and mixed in measured quantities to produce HMA. Hot mix asphalt paving materials can be manufactured by: (1) batch mix plants, (2) continuous mix (mix outside dryer drum) plants, (3) parallel flow drum mix plants, and (4) counterflow drum mix plants. An HMA plant can be constructed as a permanent plant, a skid-mounted (easily relocated) plant, or a portable plant. Most plants have the capability to use either gaseous fuels (natural gas) or fuel oil. The hot mix plant at this facility is a continuous (non-batch) process facility and uses fuel oil as a combustion source.

The continuous (non-batch) hot mix asphalt process is a continuous mixing type process, using proportioning cold feed controls for the process materials. The major difference between this process and a batch process is that the dryer is used not only to dry the material but also to mix the heated and dried aggregates with the liquid asphalt cement. The mixture is discharged at the end of the drum and is conveyed to either a surge bin or HMA storage silos, where it is loaded into transport trucks. The exhaust gases also exit the end of the drum and pass on to the collection system. Emissions associated with hot mix asphalt plants are PM, CO, VOCs, and HAPs. These emissions are regulated by MCAQD Rule 310, 316 and 40 CFR 60 Subpart I.

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PERMIT HISTORY:

Date Received	Revision Number	Description
08/04/2015	1.0.0.0	MCAQD received application for permit renewal.
09/07/2011	0.0.0.0	MCAQD issued new permit. Expiration 09/30/2016

PURPOSE FOR APPLICATION:
Permit Renewal.

A. APPLICABLE COUNTY REGULATIONS:

Rule 100: General Provisions and Definitions
Rule 200: Permit Requirements
Rule 220: Non-Title V Permit Provisions
Rule 280: Fees: Table F – Hot Mix Asphalt Plant
Rule 300: Visible Emissions
Rule 310: Fugitive Dust from Dust-Generating Operations
Rule 316: Non-Metallic Mineral Processing

B. APPLICABLE FEDERAL REGULATIONS:

40 CFR 60 Subpart I – Standards of Performance for Hot Mix Asphalt Facilities: This facility meets the definition of a hot mix asphalt facility as described in §60.90, a facility used to manufacture hot mix asphalt by heating and drying aggregate and mixing with asphalt cements and commenced construction or modification after June 11, 1973, is subject to the requirements of the aforementioned subpart.

40 CFR 60 Subpart OOO – Standards of Performance for Nonmetallic Mineral Processing Plants: This facility meets the definition of nonmetallic mineral processing plant: which means any combination of equipment that is used to crush or grind any nonmetallic mineral wherever located, including lime plants, power plants, steel mills, asphalt concrete plants, portland cement plants, or any other facility processing nonmetallic minerals except as provided in §60.670 (b) and (c).

C. AIR POLLUTION CONTROL EQUIPMENT/EMISSION CONTROL SYSTEM(s):

System description	Quantity	Comments:
Water Trucks, Sweeper, Rumble Grate, Misters, etc.		Devices listed in the DCP and O&M Plan: Submitted 09/03/2014, Approved 10/15/2014
Baghouse	1	For control of emissions from the HMA plant. O&M Plans on file: Submitted 09/03/2014, Approved 10/15/2014

D. EMISSIONS:

Hot Mix Asphalt Emissions:
Emissions from HMA plants may be divided into ducted production emissions, pre-production fugitive dust emissions, and other production-related fugitive emissions. Pre-production fugitive dust sources associated with HMA plants include vehicular traffic generating fugitive dust on paved and unpaved roads, aggregate material handling, and other aggregate processing operations. The emissions are added to emissions from the nonmetallic mineral processing section of the permit.

The most significant ducted source of emissions from parallel-flow drum mix plants is the rotary drum dryer. Emissions from the drum consist of water (as steam evaporated from the aggregate); PM; products of combustion; CO; and small amounts of organic compounds of various species (including VOC, CH4, and HAP). The organic compound and CO emissions result from incomplete combustion of the fuel and from heating and mixing of the liquid asphalt cement inside the drum.

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The process emissions are shown in Table D1 and D2. The emissions calculations for the HMA operations are shown in Worksheets: 1-4 in Appendix A. The summary of emissions calculations is shown in Worksheet 6 in Appendix A.

Waste oil-fired asphalt drum dryer emissions are calculated using the emission factors for a waste oil-fired drum dryer with a fabric filter presented in AP-42, Section 11.1, *Hot Mix Asphalt Plants* (March 2004). The annual production rate of 600,000 tons per year, and the fuel type (waste oil) was taken from the application and is written into the permit as an enforceable limit.

Asphalt loadout and silo filling emissions are calculated using the emission factors for these operations presented in AP-42, Section 11.1, *Hot Mix Asphalt Plants* (March 2004), Table 11.1-4 and on page 9 of the section. PM and TOC emission factors presented are conservatively assumed to be equal to $PM_{10}/PM_{2.5}$ and VOC emissions, respectively. HAP emissions are calculated as a percentage of PM and VOC emissions, based on the specie fractions presented in Table 11.1-15. The annual production rate of 600,000 tons per year is written into the permit as an enforceable limit.

Propane fueled boiler emissions are calculated using the emission factors for a small uncontrolled boiler presented in AP-42, Section 1.5, *LPG Combustion* (July 2008). Emission Factors are from Table 1.5-1: Emission factors for LPG Combustion. As the emissions from the heater are minimal even running 365 days a year, only a fuel limitation was put into the permit conditions for the fuel burning equipment.

Conveyor transfer point emissions are calculated using the emission factors presented in the MCAQD Emission Inventory Help Sheet for Sand and Gravel Plants, 2015. The emission factor presented for "conveyor transfer point" (CTP) is used. Since there was one CTP which processes 600,000 tons, this was used as the basis for calculations. The annual production rate of 600,000 tons was taken from the application and is written into the permit as an enforceable limit.

Screening emissions are calculated using the emission factors presented in the MCAQD Emission Inventory Help Sheet for Sand and Gravel Plants, 2015. The PM10 emission factor presented for screening with watering is used. The PM2.5 emission factor is 30% of the PM10 emission factor based on the fraction for "Crushing, Screening, Blasting, Loading and Unloading" presented in SCAQMD's Final –Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds (October 2006), Appendix A. Since there is one screen which processes the material, 600,000 tons was used as the basis for calculations. The annual production rate of 600,000 tons was taken from the application and is written into the permit as an enforceable limit.

Stockpile emissions are calculated using the emission factors presented in the MCAQD Emission Inventory Help Sheet for Sand and Gravel Plants, 2015. The emission factor presented for "Stockpiles, raw material and product storage" is used. The total footprint of all stockpiles at the site is 10 acres. A control efficiency of 90% was used for regular watering, based on footnote 4 of the same help sheet.

Unpaved road vehicle traffic emissions are calculated using the emission factors presented in the MCAQD Emission Inventory Help Sheet for Vehicle Travel on Unpaved Roads, 2015. The appropriate emission factor presented each vehicle type and speed is used. Emissions are based on a total VMT (vehicle miles traveled) of 12,000 miles for heavy duty vehicles (haul trucks, cranes), 8,000 miles for Medium Duty Vehicles (front end loaders, forklifts), and 8,000 miles for Light Duty Vehicles (pickup trucks). A control efficiency of 90% was used for regular watering, based on the same help sheet.

<u>Non-Metallic Mineral Processing</u>

Many operations and processes including mineral extraction from the earth, loading, unloading, conveying, crushing, screening, and loadout are sources of particulate matter emissions, specifically PM10. The facility has in place an enforceable limit to avoid BACT: 10,000 tons per day and 750,000 tons per 12 consecutive months. Emission factors are from the MCAQD Emissions Inventory Help Sheet for Sand and Gravel Plants, which references AP 42 Section 13.2.4.

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The emissions calculations for the non-metallic mineral operations are shown in Worksheet 5 in Appendix A. The emissions are shown in Table D1 and D2. The summary of emission calculations is shown in Worksheet 6.

TABLE D1: FACILITY WIDE EMISSIONS INCLUDING FUGITIVES (TONS/YEAR)

Pollutants (tons/year)	DRUM MIXER	LOADOUT/ SILO FILLING	HEATER	SCREENING& CONVEYOR /FUGITVE	CRUSHING/ SCREENING OPERATIONS	**FACILITY WIDE ANNUAL EMISSIONS**
CO:	39.0	0.86	0.54	-	-	40.4
NOx:	16.5	-	0.93	-	-	17.4
PM10:	6.9	0.33	0.05	1.26	24.08	37.6
PM2.5:	1.92	0.35	0.05	4.61	3.68	7.2
PM:	9.9	0.33	0.05	5.22	36.09	51.6
VOC:	9.6	5.23	0.06	-	-	14.9
SOX:	17.4	-	0.00	-	-	17.4
Total HAPs	3.2	0.09	-	-	-	3.3
Any Single HAP – list each one separately						
Formaldehyde	1.0	0.5	-	-	-	1.0

TABLE D2: FACILITY WIDE EMISSIONS W/O FUGITIVES (TONS/YEAR)

Pollutants (tons/year)	DRUM MIXER	LOADOUT/ SILO FILLING	HEATER	SCREENING & CONVEYOR	CRUSHING/ SCREENING OPERATIONS	**FACILITY WIDE ANNUAL EMISSIONS**
CO:	39.0	0.89	0.54	-	-	40.4
NOx:	16.5	-	0.93	-	-	17.5
PM10:	6.9	0.33	0.05	0.13	3.49	10.9
PM2.5:	1.92	0.35	0.05	0.06	1.01	3.4
PM:	9.9	0.33	0.05	0.74	13.09	24.1
VOC:	9.6	5.23	0.06	-	-	14.9
SOX:	17.4	-	0.00	-	-	17.7
Total HAPs	3.2	0.09	-	-	-	3.3
Any Single HAP – list each one separately						
Formaldehyde	1.0	0.5	-	-	-	1.0

E. HAP EMISSION IMPACTS:

The HMA produces HAPs that exceed the values from Table 2: MCAQD HAPs De Minimis Levels. The listing of the HAPs is listed in Appendix B.

Screen modeling was performed on the Acetaldehyde HAP from the HMA process per MCAQD HAP Permitting Technical Guidance (TG-2011-001; issued on 10/31/2011). The modeling was performed using BREEZE AERSCREEN: the HAPs were modeled as a point source. Using the modeling results the remaining HAPs were scaled to determine if the HAPs exceeded acute and/or chronic ambient air concentrations.

The screen model's raw output data and parameters are located in Appendix B. In the table below the maximum 1-hour and scaled annual concentrations at the nearest property line were compared to the Acute and Chronic Ambient Air Concentrations listed in Table 1 of the HAP Permitting Technical Guidance document.

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COMPARISON OF HAP CONCENTRATIONS

Pollutant	[1]Ambient Air Concentrations (mg/m^3)		Screen Model Results (mg/m^3)		Higher than Ambient Air Concentration?	
	Acute	Chronic	Maximum 1-hr Conc.	Scaled Annual Conc.	Acute	Chronic
Acetaldehyde	3.06E+02	8.62E-04	8.62E-03	8.62E-04	No	Yes
Acrolein	2.30E-01	2.09E-05	1.72E-04	1.72E-05	No	No
Arsenic	2.50E+00	4.41E-07	3.71E-06	3.71E-07	No	No
Benzene	1.28E+03	2.43E-04	2.63E-03	2.63E-04	No	Yes
Cadmium	2.50E-01	1.05E-06	2.72E-06	2.72E-07	No	No
Chromium	1.00E-01	1.58E-07	3.65E-05	3.65E-06	No	Yes
Cobalt	1.00E+01	6.86E-07	1.72E-07	1.72E-08	No	No
Formaldehyde	1.70E+01	1.46E-04	2.11E-02	2.11E-03	No	Yes
Hex-Chromium	1.00E-01	1.58E-07	2.98E-06	2.98E-07	No	Yes
Manganese	2.50E+00	5.21E-05	5.11E-05	5.11E-06	No	No
Methylnaphthalene	7.50E+01	5.58E-05	1.41E-03	1.41E-04	No	Yes
Naphthalene	7.50E+01	5.58E-05	4.42E-03	4.42E-04	No	Yes
Nickel	5.00E+00	7.90E-06	4.18E-04	4.18E-05	No	Yes
Propionaldehyde	4.03E+02	8.62E-04	8.62E-04	8.62E-05	No	No
Total PAH HAPs [2]	5.00E+00	2.02E-06	6.77E-04	6.77E-05	No	Yes

Notes:

1. Concentrations found in Table 1 of MCAQD HAP Permitting Technical Guidance (TG-2011-001; issued on 10/31/2011).
2. Polycyclic Aromatic Hydrocarbons (PAH) - all De Minimus levels, AAAC and CAAC identified in Rule 372 under "Polycyclic Organic Matter".

F. PERFORMANCE TESTING:

Under Subpart OOO, aggregate facilities are required to conduct performance testing on stationary equipment in accordance with EPA Reference Method 9. Method 9 is a visual emissions test that determines opacity or the percentage of the light that is prevented from passing through a plume or fugitive emission. Individuals performing the opacity readings are required to be trained and certified in accordance with the method. EPA has set specific limits for the aggregates industry based on opacity readings designated to various processing equipment ranging from 7-15 percent (%). Among the requirements of Method 9 is determining the average of twenty-four readings over a six-minute period for a total of one hour for each piece of equipment that falls under the purview of NSPS.

Performance testing is required on the *Hot Mix Asphalt Drum Dryer Baghouse* to demonstrate compliance with the capture and control efficiency specified by the permit conditions stipulated from MCAQD Rule 316 and 40 CFR 60 Subpart I. Testing shall demonstrate compliance with all applicable PM 10, SO_x, VOC, NO_X and CO concentrations.

G. REGULATORY REQUIREMENTS AND MONITORING:

01/27/2016 Site Visit w/ Inspector.

04/06/2016 Emailed Gregg Monger for clarification on the fuel used in heater for the HMA. The heater is fueled with propane.

Records indicate that a Visible Emissions Test required per NSPS Subpart OOO was performed on 03/20/2007

There are a total of three aboveground storage tanks for diesel fuel and gasoline; 2 tanks for diesel and one tank for gasoline. The gasoline tank capacity is 175 gallons. Capacity less than 250 gallons is considered Deminimis and therefore is not subject to Rule 353. MCAQD does not regulate storage and dispensing of diesel fuel.

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APPENDIX A

Worksheet 1: Drum Dryer Emissions

Maricopa County
Air Quality Department

EMISSION CALCULATION WORKSHEET FOR USED OIL-FIRED ASPHALT DRUM DRYERS

Business Name: Vulcan Materials Company -Avondale **Permit:** 090234

Asphalt Drum Dryer - Waste Oil Fired (AP-42 Tables 11.1-3 & 11.1-7 & 11.1-8)

Asphalt Throughput	**600,000**	tons/yr
	2,500	tons/day
Rated Capacity	**400**	tons/hr

Operating Schedule

Hours per Day	10.0	hrs/day
Days per Year	365.0	days/yr

	Emission Factors		Emissions tons/yr
CO	0.130	lbs/ton	**39.00**
NOx	0.055	lbs/ton	**16.50**
VOC	0.032	lbs/ton	**9.60**
SOx	0.058	lbs/ton	**17.40**
PM	0.033	lbs/ton	**9.90**
PM2.5	0.006	lbs/ton	**1.92**
PM10	0.023	lbs/ton	**6.90**

HAP Emissions

Emission factors taken from AP-42, Tables 11.1-10 and 11.1-12

Pollutant	**Emission Factor (lb/ton HMA)**	**Hourly Emissions (lbs/hr)**	**Annual Emissions (lbs/yr)**
1,1,1-Trichloroethane (methyl chloroform)	4.80E-05	1.92E-02	2.88E+01
2,2,4-Trimethylpentane (Isooctane)	4.00E-05	1.60E-02	2.40E+01
Acenaphthene *	1.40E-06	5.60E-04	8.40E-01
Acenaphthylene *	2.20E-05	8.80E-03	1.32E+01
Acetaldehyde	1.30E-03	5.20E-01	7.80E+02
Acrolein	2.60E-05	1.04E-02	1.56E+01
Anthracene *	3.10E-06	1.24E-03	1.86E+00
Antimony	1.80E-07	7.20E-05	1.08E-01
Arsenic	5.60E-07	2.24E-04	3.36E-01
Barium	5.80E-06	2.32E-03	3.48E+00
Benzene	3.90E-04	1.56E-01	2.34E+02
Benzo(a)anthracene *	2.10E-07	8.40E-05	1.26E-01
Benzo(a)pyrene *	9.80E-09	3.92E-06	5.88E-03
Benzo(b)fluoranthene *	1.00E-07	4.00E-05	6.00E-02
Benzo(e)pyrene *	1.10E-07	4.40E-05	6.60E-02
Benzo(g,h,i)perylene *	4.00E-08	1.60E-05	2.40E-02
Benzo(k)fluoranthene *	4.10E-08	1.64E-05	2.46E-02
Cadmium	4.10E-07	1.64E-04	2.46E-01
Chromium	5.50E-06	2.20E-03	3.30E+00
Chrysene *	1.80E-07	7.20E-05	1.08E-01
Cobalt	2.60E-08	1.04E-05	1.56E-02
Ethylbenzene	2.40E-04	9.60E-02	1.44E+02
Fluoranthene *	6.10E-07	2.44E-04	3.66E-01
Fluorene *	1.10E-05	4.40E-03	6.60E+00
Formaldehyde	3.10E-03	1.24E+00	1.86E+03
Hexane	9.20E-04	3.68E-01	5.52E+02
Hex-Chromium	4.50E-07	1.80E-04	2.70E-01
Indeno(1,2,3-cd)pyrene *	7.00E-09	2.80E-06	4.20E-03
Lead	1.50E-05	6.00E-03	9.00E+00
Manganese	7.70E-06	3.08E-03	4.62E+00
Mercury	2.60E-06	1.04E-03	1.56E+00
Methylnaphthalene	1.70E-04	6.80E-02	1.02E+02
Naphthalene	6.50E-04	2.60E-01	3.90E+02
Nickel	6.30E-05	2.52E-02	3.78E+01
Perylene *	8.80E-09	3.52E-06	5.28E-03
Phenanthrene *	2.30E-05	9.20E-03	1.38E+01
Phosphorous	2.80E-05	1.12E-02	1.68E+01
Propionaldehyde	1.30E-04	5.20E-02	7.80E+01
Pyrene *	3.00E-06	1.20E-03	1.80E+00
Quinone	1.60E-04	6.40E-02	9.60E+01
Selenium	3.50E-07	1.40E-04	2.10E-01
Silver	4.80E-07	1.92E-04	2.88E-01
Thallium	4.10E-09	1.64E-06	2.46E-03
Toluene	2.90E-03	1.16E+00	1.74E+03
Total PCDD/PCDF (Dibenzofurans) *	1.20E-10	4.80E-08	7.20E-05
Xylenes (Total)	2.00E-04	8.00E-02	1.20E+02
Zinc	6.10E-05	2.44E-02	3.66E+01
Total			**6,318**

	lbs/day	**tons/yr**
HAPS Emissions	**43**	**3.2**

* Polycyclic Aromatic Hydrocarbons (PAH)

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Worksheet 2: Loadout and Silo Filing

Maricopa County
Air Quality Department

EMISSION CALCULATION WORKSHEET FOR ASPHALT LOADOUT AND SILO FILLING

Business Name: Vulcan Materials Company -Avondale Plant **Permit:** 090234

AP-42, Table 11.1-14. Predictive Emission Factor Equations for Load-out and Silo Filling Operations

Asphalt Throughput	600,000	tons/yr
	2,500	tons/day
Rated Capacity	400	tons/hr
Operating Schedule		
Hours per Day	10.0	hrs/day
Days per Year	365.0	days/yr
Asphalt Volatility	**-0.5**	
HMA Mix Temperature	**325**	°F

Source	Pollutant	Equation	Emission Factor lbs/ton	Emissions lbs/hr	Emissions lbs/year
Drum mix or batch mix plant	PM/PM2.5/PM10	EF = 0.000181 + 0.00141 (-V)e	0.000522	**0.2088**	**313**
load-out	VOC	EF = 0.0172(-V)e$^{(0.0251)(T+460)-20}$	0.004159	**1.6636**	**2,495**
(SCC 3-05-002-14)	CO	EF = 0.00558(-V)e$^{(0.0251)(T+460)-}$	0.001349	**0.5396**	**809**
Silo filling	PM/PM2.5/PM10	EF = 0.000332 + 0.00105 (-V)e	0.000586	**0.2344**	**352**
(SCC 3-05-002-13)	VOC	EF = 0.0504(-V)e$^{((0.0251)(T+460)-20}$	0.012187	**4.8748**	**7,312**
	CO	EF = 0.00488(-V)e$^{(0.0251)(T+460)-}$	0.00118	**0.472**	**708**
Transport emissions following	VOC		0.0011	**0.44**	**660**
load-out	CO		0.000352	**0.1408**	**211**
Total	PM/PM2.5/PM10			**0.4432**	**665**
	VOC			**6.9784**	**10,468**
	CO			**1.1524**	**1,729**

In the equation, V = Asphalt volatility, as determined by ASTM Method D2872-88. Regional or site specific data for asphalt volatility should be used, whenever not possible, a default value of -0.5 should be used for V.
T = HMA mix temperature in °F, when site-specific data is not available, use default value 325 for T.
Total PM, as measured by EPA Method 315 (EPA Method 5 plus the extractable organic particulate from the impingers).
Total PM is assumed to be predominantly PM-2.5 since emissions consist of condensed vapors. Transport emission factors (VOC and CO) following load-out were taken from AP-42 Chapter 11.1-9

HAP Emissions

EPA document AP-42, Chapter 11.1, Tables 11.1-15 and 11.1-16 provide emission factors for toxic pollutants emitted from silo filling and silo load-out operations.

Pollutant	Speciation Profile for Load-out and Yard Emissions	Speciation Profile for Silo Filling and Asphalt Storage Tank Emissions	Hourly Emissions (lbs/hr)	Annual Emissions (lbs/yr)	
Acenaphthene *	0.260%	0.470%	1.64E-03	2.47E+00	Organic particulate-based compounds.
Acenaphthylene *	0.028%	0.014%	9.13E-05	1.37E-01	
Anthracene *	0.070%	0.130%	4.51E-04	6.76E-01	
Benzo(a)anthracene *	0.019%	0.056%	1.71E-04	2.56E-01	
Benzo(b)fluoranthene *	0.0076%		1.59E-05	2.38E-02	
Benzo(k)fluoranthene *	0.0022%		4.59E-06	6.89E-03	
Benzo(g,h,i)perylene *	0.0019%		3.97E-06	5.95E-03	
Benzo(a)pyrene *	0.0023%		4.80E-06	7.20E-03	
Benzo(e)pyrene *	0.0078%	0.0095%	3.86E-05	5.78E-02	
Chrysene *	0.103%	0.210%	7.07E-04	1.06E+00	
Dibenz(a,h)anthracene *	0.00037%		7.73E-07	1.16E-03	
Fluoranthene *	0.050%	0.150%	4.56E-04	6.84E-01	
Fluorene *	0.77%	1.01%	3.98E-03	5.96E+00	
Indeno(1,2,3-cd)pyrene *	0.00047%		9.81E-07	1.47E-03	
Methylnaphthalene	2.38%	5.27%	1.73E-02	2.60E+01	
Naphthalene	1.25%	1.82%	6.88E-03	1.03E+01	
Perylene *	0.022%	0.030%	1.16E-04	1.74E-01	
Phenanthrene *	0.81%	1.80%	5.91E-03	8.87E+00	
Pyrene *	0.15%	0.44%	1.34E-03	2.02E+00	
Benzene	0.052%	0.032%	2.43E-03	3.64E+00	Organic volatile-based compounds.
Methyl Bromide (Bromomethane)	0.0096%	0.0049%	3.99E-04	5.98E-01	
2-Butanone (MEK)	0.049%	0.039%	2.72E-03	4.07E+00	
Carbon Disulfide	0.013%	0.016%	9.96E-04	1.49E+00	
Ethyl Chloride (Chloroethane)	0.00021%	0.00400%	1.98E-04	2.98E-01	
Methyl Chloride (Chloromethane)	0.015%	0.023%	1.37E-03	2.06E+00	
Cumene	0.11%		1.83E-03	2.74E+00	
Ethylbenzene	0.28%	0.04%	6.51E-03	9.77E+00	
Formaldehyde	0.088%	0.690%	3.51E-02	5.27E+01	
Hexane	0.15%	0.10%	7.37E-03	1.11E+01	
2,2,4-Trimethylpentane (Isooctane)	0.0018%	0.0003%	4.51E-05	6.76E-02	
Styrene	0.0073%	0.0054%	3.85E-04	5.77E-01	
Tetrachloroethylene (Perchloroethylen	0.0077%		1.28E-04	1.92E-01	
Toluene	0.21%	0.06%	6.52E-03	9.77E+00	
Trichlorofluoromethane	0.0013%		2.16E-05	3.24E-02	
m-/p-Xylene	0.41%	0.20%	1.66E-02	2.49E+01	
o-Xylene	0.08%	0.06%	4.11E-03	6.16E+00	
Total HAPs				**188.74**	

* Polycyclic Aromatic Hydrocarbons (PAH)

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Worksheet 3: Fuel Oiled Fired Boiler

Maricopa County
Air Quality Department

EMISSION CALCULATION WORKSHEET FOR PROPANE FIRED BOILERS

Business Name: Vulcan Materials Company -Avondale Plant **Permit:** 090234

Total Input Rate: 1.5 **Units:** MMBtu/hr **Hours of Operation:** 8760

Calculation Methodology

Emission Factors:

CO	7.5	lb/10^3 gal
NO_X	13	lb/10^3 gal
SO_X	0.05	lb/10^3 gal
$PM/PM_{10}/PM_{2.5}$	0.7	lb/10^3 gal
VOC[1]	0.8	lb/10^3 gal

Source: AP-42, Section 1.5, Emission Factors for LPG Combustion (July 2008), Table 1.5-1

Conversion: 91.5×10^6 BTU/10^3 gal for propane

1. VOC = TOC - CH4 Emission Factor = 1.0-0.2 = 0.8

Calculations:

$$Emission\ Factor \times Input\ Rate \times Hours\ of\ Operation = lbs\ of\ Pollutant$$

Total Boiler Emissions:

Pollutant	Annual Emissions			
CO	1,077	lbs	0.54	tons
NO_X	1,867	lbs	0.93	tons
SO_X	7	lbs	0.00	tons
$PM/PM_{10}/PM_{2.5}$	101	lbs	0.05	tons
VOC	115	lbs	0.06	tons

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Worksheet 4: Screening and Conveyor Transfer Points

Maricopa County
Air Quality Department

EMISSION CALCULATION WORKSHEET FOR HMA SCALPING SCREEN AND CONVEYOR TRANSFER POINTS

Business Name: Vulcan Materials Company -Avondale Plant **Permit:** **Permit:** 090234

Capacity:	600,000	tons/year
	2,500	tons/day
	400	tons/hour

	# of Units	Emission Factors PM-10	Emissions (lbs/yr) PM-10
Screening with watering [1]	1	0.00035	210
Conveyors [1,2]	2	0.000045	54
Total:			**264**

	# of Units	Emission Factors PM2.5	Emissions (lbs/yr) PM2.5
Screening with watering [1]	1	0.00011	66
Conveyors [1,2]	2	0.000045	54
Total:			**120**

	# of Units	Emission PM	Emissions PM
Screening with watering [1]	1	0.00220	1320
Conveyors [1,2]	2	0.000140	168
Total:			**1,488**

Fugitive Emissions from Stockpiles

Stockpile Acreage	Emission Factors (lbs/acre-year) PM2.5	Emission Factors (lbs/acre-year) PM10	Abatement Efficiency	Annual Emissions PM2.5	Annual Emissions PM10	Annual Emissions PM
10	630	630	90%	**630**	**630**	**630**

PM-10 Emission factors from MCAQD 2013 Emission Inventory Helpsheet for Sand and Gravel Plants.
PM Emission factors taken from AP-42 Chapter 11.19.2 Crushed Stone Processing.

Fugitive Emission from Unpaved Road
(Note: Use different emission factors if vehicle speed is not 15 mph)

Fugitive Emissions from Vehiclular Traffic (@15 mph)	**Vehicle Miles Travelled**		**EF (lb/VMT)**	**Control Efficency**	**PM-10 Emissions (tons/yr)**	**PM-2.5 Emissions (tons/yr)**
Light duty (3,000 pound):	5,000	VMT/yr	0.44	90%	**1.6**	**0.3**
Medium duty (13,000 pound):	10,000	VMT/yr	0.86	90%	**1.5**	**0.3**
Heavy duty (80,000 pound):	12,000	VMT/yr	3.2	90%	**1.1**	**0.2**

Emission factors from MCAQD 2008 Emission Inventory Helpsheet for Vehicle Travel on Unpaved Roads. PM10 is assumed to be the same as PM.

			Ratio (Lt:Med:Hvy)
Total Materials Transport:	600,000	tons per year	
Lt-duty (3,000 pound):	74,074	load-outs	0.19
Med-duty (13,000 pound):	34,188	load-outs	0.37
Hvy-duty (80,000 pound):	6,667	load-outs	0.44
	114,929	Total loads to move product	

Note:
VMT calculations do not actually indicate the number of miles traveled within the plant. To calculate that, muliply the above Emissions (tpy) by an average distance between affected operation and nearest exit (and multiply by 2 - trip in, trip out). Above "Total" only indicates number of "one-way" trips needed to move out total product. Vehicle payload capacities for listed classifications are estimated using Wikipedia.

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Worksheet 5: Non-Metallic Mineral Processing

Maricopa County
Air Quality Department

EMISSION CALCULATION WORKSHEET FOR NON-METALLIC MINERAL PROCESSING: CRUSHING/SCREENING/FUGITIVE

Business Name: Vulcan Materials Company -Avondale Plant **Permit:** 090234

Hours per day	**10**	hrs/day	Total Plant Capacity:	**300**	tons/hr
Days per week:	**7**	days/wk		3000	tons/day
Weeks per year:	**52**	wks/yr		750,000	tons/yr
	364	**days/yr**			
Lt-duty @15mph	8,000	VMT/yr			
Med-duty @15mph	8,000	VMT/yr			
Hvy-duty @15mph	12,000	VMT/yr			

Dust Emissions from Material Handling

				Emission Factors			Emissions (lbs/hr)			Emissions (lbs/yr)		
Non-Fugitive Emissions	Material Throughput		# of Units	PM-2.5	PM-10	PM	PM-2.5	PM-10	PM	**PM-2.5**	**PM-10**	**PM**
Crushing with watering [1]	**750,000**	tons/yr	**3**	0.00010 [1]	0.00001 [1]	0.00022 [1]	0.09	0.01	0.20	225	22	498
Screening with watering [1]	**750,000**	tons/yr	**7**	0.00005 [1]	0.00035 [1]	0.00103 [1]	0.11	0.74	2.15	263	1862	5381
Fines screening with watering [1]	**750,000**	tons/yr	**2**	0.00089 [4]	0.00295 [1]	0.01230 [1]	0.53	1.77	7.38	1328	4428	18450
Conveyors [1,2]	**750,000**	tons/yr	**20**	0.000013 [1]	0.000045 [1]	0.000123 [1]	0.08	0.27	0.74	195	677	1845
Total:							**0.8**	**2.8**	**10.5**	**2,011**	**6,989**	**26,174**

				Emission Factors			Emissions (lbs/hr)			Emissions (lbs/yr)		
Fugitive Emissions	Material Throughput		# of Units	PM-2.5	PM-10	PM	PM-2.5	PM-10	PM	**PM-2.5**	**PM-10**	**PM**
Mining/Plant feed, handling	**750,000**	tons/yr	**1**	8.329E-05 [3]	0.00055 [3]	0.00111 [3]	0.02	0.17	0.33	62	413	833
Surge Pile forming, handling	**750,000**	tons/yr	**1**	8.329E-05 [3]	0.00055 [3]	0.00111 [3]	0.02	0.17	0.33	62	413	833
Pile forming, handling	**750,000**	tons/yr	**1**	8.329E-05 [3]	0.00055 [3]	0.00111 [3]	0.02	0.17	0.33	62	413	833
Load out, handling with watering [2]	**750,000**	tons/yr	**1**	8.329E-05 [3]	0.00055 [3]	0.00111 [3]	0.02	0.17	0.33	62	413	833
Stockpiles	**60**	acre	**N/A**	189 [4]	630 [2]	630 [2]	N/A	N/A	N/A	240	37800	37800
Total:							**0.1**	**0.7**	**1.3**	**489.9**	**39450.0**	**41130.0**

Fugitive Emissions From Vehicle Traffic	EF (lb/VMT)	Control Efficency	Emissions (tons/yr)
Light Duty Vehicles @15 mph	0.44	90%	0.2
Medium Duty Vehicles @15 mph	0.86	90%	0.3
Heavy Duty Vehicles @15 mph	3.2	90%	1.9

Emissions Summary (excluding fugitives)		
PM-2.5:	**1.0**	**tons/yr**
PM-10:	**3.5**	**tons/yr**
PM:	**13.1**	**tons/yr**

Emissions Summary (including fugitives)		
PM-2.5:	**3.7**	**tons/yr**
PM-10:	**25.7**	**tons/yr**
PM:	**36.1**	**tons/yr**

[1] Reference: U.S. EPA, "Compilation of Air Pollutant Emission Factors: Volume I: Stationary Point and Area Sources" (AP-42), fifth ed. Table 11.19.2-2.
Uncontrolled PM and PM10 emission factors are used multiplied by a control efficiency for 4% moisture of 95.9%
[2] Reference: WebFire, SCC = 30502507. The stockpile emission factor above assumes 90% control, assuming regular watering or use of a chemical palliative (dust suppressant)
[3] Reference: U.S. EPA, AP-42, Equation 1. p. 13.2.4-3
[4] Methodology to Calculate Particulate Matter (PM) 2.5, South Coast Air Quality Management District Oct. 2006 (PM2.5 = 0.3 * PM10)

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Worksheet 6: Emission Summary

Maricopa County
Air Quality Department

SUMMARY EMISSION CALCULATION WORKSHEET

Business Name: Vulcan Materials Company -Avondale Plant **Permit:** 090234

Emissions Summary

	Annual tons/yr	
CO	40.4	
NOx	17.4	
VOC	14.9	
SOx	17.4	
PM (with fugatives)	51.6	
PM2.5 (with fugatives)	7.2	*
PM10 (with fugatives)	37.6	*
PM (w/o fugatives)	24.1	
PM2.5 (w/o fugatives)	3.4	
PM10 (w/o fugatives)	10.9	
Total HAP	3.3	
Single HAP	1.0	

HMA Drum Mix

	Annual tons/yr
CO	39.00
NOx	16.50
VOC	9.60
SOx	17.40
PM	9.90
PM2.5	1.92
PM10	6.90
Total HAP	3.20

Non-Metallic Mineral Processing Emissions From Crushing/Screening

	Annual tons/yr
Summary (excluding fugitives)	
PM-2.5:	1.01
PM-10:	3.49
PM:	13.09
Summary (including fugitives)	
PM-2.5:	3.69
PM-10:	25.66
PM:	36.09

Loadout & Silo Filling

	Annual tons/yr
CO	0.86
NOx	
VOC	5.23
SOx	
PM	0.33
PM2.5	0.33
PM10	0.33
Total HAP	0.09

Heater

	Annual tons/yr
CO	0.54
NOx	0.93
VOC	0.06
SOx	0.00
PM	0.05
PM2.5	0.05
PM10	0.05
Total HAP	

Scalping Screen & Conveyor

	Annual tons/yr
CO	
NOx	
VOC	
SOx	
PM	0.74
PM2.5	0.06
PM10	0.13
Total HAP	

Fugitive from stockpile & road

	Annual tons/yr
CO	
NOx	
VOC	
SOx	
PM	4.48
PM2.5	1.20
PM10	4.48
Total HAP	

* Use for comparison with the major source threshold.

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090234 Asphalt Plant
- burning Used Oil.xls

APPENDIX B: HAPS

Maricopa County
Air Quality Department

HAPs SUMMARY

Business Name: Vulcan Materials C **Permit:** 090234

'Drum Mix' & 'Loadout and Silo Filling' Combined HAP Emissions

Pollutant	Hourly Emissions (lbs/hr)	Annual Emissions (lbs/yr)	De Minimis (lbs/hr)	De Minimis (lbs/yr) °	AAAC ² (mg/m³)	CAAC ³ (mg/m³)	SCREEN Model Required?	Modeled 1 HR CONC	Modeled Scaled Annual Conc	>AAAC	>CAAC
Acetaldehyde	5.20E-01	7.80E+02	--	5.30E+00	3.06E+02	8.62E-04	Yes	8.62E-03	8.62E-04	No	Yes
Acrolein	1.04E-02	1.56E+01	1.30E-02	1.29E-01	2.30E-01	2.09E-05	Yes	1.72E-04	1.72E-05	No	No
Arsenic	2.24E-04	3.36E-01	--	2.70E-03	2.50E+00	4.41E-07	Yes	3.71E-06	3.71E-07	No	No
Benzene	1.58E-01	2.38E+02	--	1.50E+00	1.28E+03	2.43E-04	Yes	2.63E-03	2.63E-04	No	Yes
Cadmium	1.64E-04	2.46E-01	--	6.50E-03	2.50E-01	1.05E-06	Yes	2.72E-06	2.72E-07	No	No
Chromium	2.20E-03	3.30E+00	--	1.00E-03	1.00E-01	1.58E-07	Yes	3.65E-05	3.65E-06	No	Yes
Cobalt	1.04E-05	1.56E-02	--	4.20E-03	1.00E+01	6.86E-07	Yes	1.72E-07	1.72E-08	No	No
Formaldehyde	1.28E+00	1.91E+03	--	9.00E-01	1.70E+01	1.46E-04	Yes	2.11E-02	2.11E-03	No	Yes
Hex-Chromium	1.80E-04	2.70E-01	--	1.00E-03	1.00E-01	1.58E-07	Yes	2.98E-06	2.98E-07	No	Yes
Manganese	3.08E-03	4.62E+00	1.40E-01	3.20E-01	2.50E+00	5.21E-05	Yes	5.11E-05	5.11E-06	No	No
Methylnaphthalene	8.53E-02	1.28E+02	--	3.50E-01	7.50E+01	5.58E-05	Yes	1.41E-03	1.41E-04	No	Yes
Naphthalene	2.67E-01	4.00E+02	--	3.50E-01	7.50E+01	5.58E-05	Yes	4.42E-03	4.42E-04	No	Yes
Nickel	2.52E-02	3.78E+01	--	4.90E-02	5.00E+00	7.90E-06	Yes	4.18E-04	4.18E-05	No	Yes
Propionaldehyde	5.20E-02	7.80E+01	--	5.30E+00	4.03E+02	8.62E-04	Yes	8.62E-04	8.62E-05	No	No
Toluene	1.17E+00	1.75E+03	1.09E+02	1.46E+05	1.92E+03	5.21E+00					
Total PAH HAPs ¹	4.09E-02	6.13E+01	--	1.30E-02	5.00E+00	2.02E-06	Yes	6.77E-04	6.77E-05	No	Yes
1,1,1-Trichloroethane (methyl chlorofo	1.92E-02	2.88E+01	1.17E+02	*500*	2.08E+03	2.30E+00					
2,2,4-Trimethylpentane (Isooctane)	1.60E-02	2.41E+01	5.10E+01	*500*	9.00E+02	--					
Antimony	7.20E-05	1.08E-01	7.10E-01	9.00E+00	1.30E+01	1.46E-03					
Carbon Disulfide	9.96E-04	1.49E+00	1.80E+01	*500*	3.11E+02	7.30E-01					
Ethyl Chloride (Chloroethane)	1.98E-04	2.98E-01	7.10E+01	*500*	1.25E+03	1.04E+01					
Ethylbenzene	1.03E-01	1.54E+02	1.40E+01	*500*	2.50E+02	1.04E+00					
Hexane	3.75E-01	5.63E+02	6.59E+02	1.37E+04	1.16E+04	2.21E+00					
Mercury	1.04E-03	1.56E+00	5.80E-02	1.90E+00	1.00E+00	3.13E-04					
Methyl Bromide (Bromomethane)	3.99E-04	5.98E-01	1.50E+01	3.20E+01	2.61E+02	5.21E-03					
Methyl Chloride (Chloromethane)	1.37E-03	2.06E+00	6.70E+01	*500*	1.18E+03	9.39E-02					
Selenium	1.40E-04	2.10E-01	2.80E-02	1.13E+02	5.00E-01	1.83E-02					
Tetrachloroethylene (Perchloroethyle	1.28E-04	1.92E-01	--	2.00E+00	8.14E+02	3.20E-04					
Total Xylenes	1.01E-01	1.51E+02	9.80E+01	*500*	1.74E+03	1.04E-01					

° Modeling requirement is triggered when annual PTE exceeds the De Minimus level
¹ Polycyclic Aromatic Hydrocarbons (PAH) - all De Minimus levels, AAAC and CAAC identified in Rule 372 under "Polycyclic Organic Matter".
² Acute Ambient Air Concentration
³ Chronic Ambient Air Concentration

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MODELING RESULTS FOR ACETALDAHYDE

```
AERSCREEN 11126 / AERMOD  1335                                    04/05/16
                                                                  15:32:25

TITLE:  VULCAN-AVONDALE PLANT: ACETALDEHYDE
-----------------------------------------------------------------------------
****************************  STACK PARAMETERS  ****************************
-----------------------------------------------------------------------------

SOURCE EMISSION RATE:            0.0655 g/s                 0.520 lb/hr
STACK HEIGHT:                      3.66 meters              12.00 feet
STACK INNER DIAMETER:             0.305 meters              12.00 inches
PLUME EXIT TEMPERATURE:           Ambient
PLUME EXIT VELOCITY:              0.001 m/s                  0.00 ft/s
STACK AIR FLOW RATE:                  0 ACFM
RURAL OR URBAN:                   URBAN
POPULATION:                     3800000

INITIAL PROBE DISTANCE =           325. meters               1066. feet
-----------------------------------------------------------------------------
```

```
**********************  BUILDING DOWNWASH PARAMETERS  *********************
-------------------------------------------------------------------------------

         NO BUILDING DOWNWASH HAS BEEN REQUESTED FOR THIS ANALYSIS

**************************  PROBE ANALYSIS  ***************************
                 25 meter receptor spacing: 122. meters - 325. meters

     Zo       ROUGHNESS       1-HR CONC   DIST      TEMPORAL
     SECTOR     LENGTH         (ug/m3)     (m)       PERIOD
     ---------------------------------------------------------------------
      1*         1.000         8.623       121.9      WIN
* = worst case flow sector
-------------------------------------------------------------------------------
**********************  MAKEMET METEOROLOGY PARAMETERS  *********************
-------------------------------------------------------------------------------

MIN/MAX TEMPERATURE:    255.4 / 322.0 (K)

MINIMUM WIND SPEED:       0.5 m/s

ANEMOMETER HEIGHT:     10.000 meters

SURFACE CHARACTERISTICS INPUT: AERMET SEASONAL TABLES

DOMINANT SURFACE PROFILE: Urban
DOMINANT CLIMATE TYPE:    Dry Conditions
DOMINANT SEASON:          Winter

ALBEDO:                  0.35
BOWEN RATIO:             2.00
ROUGHNESS LENGTH:       1.000 (meters)

       METEOROLOGY CONDITIONS USED TO PREDICT OVERALL MAXIMUM IMPACT
       -------------------------------------------------------------

 YR MO DY JDY HR
 -- -- -- --- --
 10 01 10  10 01

    H0     U*     W*  DT/DZ ZICNV ZIMCH  M-O LEN    Z0  BOWEN ALBEDO  REF WS
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
 -1.32  0.043 -9.000  0.020 -999.   21.      6.1 1.000   2.00   0.35    0.50

    HT  REF TA     HT
- - - - - - - - - - -
  10.0   322.0    2.0

ESTIMATED FINAL PLUME HEIGHT (non-downwash):      2.7 meters

       METEOROLOGY CONDITIONS USED TO PREDICT AMBIENT BOUNDARY IMPACT
       --------------------------------------------------------------

 YR MO DY JDY HR
 -- -- -- --- --
 10 01 10  10 01

    H0     U*     W*  DT/DZ ZICNV ZIMCH  M-O LEN    Z0  BOWEN ALBEDO  REF WS
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
 -1.32  0.043 -9.000  0.020 -999.   21.      6.1 1.000   2.00   0.35    0.50

    HT  REF TA     HT
- - - - - - - - - - -
  10.0   322.0    2.0

ESTIMATED FINAL PLUME HEIGHT (non-downwash):      2.7 meters
```

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```
-----------------------------------------------------------------------------
************************ AERSCREEN AUTOMATED DISTANCES **********************
                  OVERALL MAXIMUM CONCENTRATIONS BY DISTANCE
-----------------------------------------------------------------------------
```

DIST (m)	MAXIMUM 1-HR CONC (ug/m3)	DIST (m)	MAXIMUM 1-HR CONC (ug/m3)
121.92	8.623	225.00	3.770
125.00	8.263	250.00	3.296
150.00	6.050	275.00	2.894
175.00	4.962	300.00	2.554
200.00	4.328	325.00	2.266

```
-----------------------------------------------------------------------------
**********************  AERSCREEN MAXIMUM IMPACT SUMMARY  *********************
-----------------------------------------------------------------------------
```

CALCULATION PROCEDURE	MAXIMUM 1-HOUR CONC (ug/m3)	SCALED 3-HOUR CONC (ug/m3)	SCALED 8-HOUR CONC (ug/m3)	SCALED 24-HOUR CONC (ug/m3)	SCALED ANNUAL CONC (ug/m3)
FLAT TERRAIN	8.623	8.623	7.761	5.174	0.8623

DISTANCE FROM SOURCE 121.92 meters

IMPACT AT THE AMBIENT BOUNDARY	8.623	8.623	7.761	5.174	0.8623

DISTANCE FROM SOURCE 121.92 meters

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Items 1-15 Front page: Items 1 to 15 (14 for Renewals) must be completed.

Notes to engineer:

- *For renewal applications the source must either answer 'No' to questions 2-5 or submit an application for a permit modification.*
- *Item 8: Many applicants do not know the SIC code or NAICS code for their industry. For a new application the code can be obtained by doing an on-line search. http://www.osha.gov/pls/imis/sicsearch.html*
- *Items 5, 7 and 14: These may be the same for many applicants.*

Complete: [x] Incomplete: [ ]

Item 16: A simple site diagram has been included, preferably on a standard size paper. Detailed blueprints or construction drawings are not required.

Complete: [x] Incomplete: [ ] N/A: [ ]

Item 17: A simple process flow diagram on a standard size paper is preferred. A process flow diagram may not be needed for some small businesses.

Complete: [x] Incomplete: [ ] N/A: [ ]

Item 18: An O&M plan is required only for a control device. An O&M plan is not required for a spray booth. Instead of including the O&M plan with the application, an applicant may submit it after receiving the permit.

Complete: [x] Incomplete: [ ] N/A: [ ]

Item 19: A dust control plan, if required, must accompany the permit application. The plan will be reviewed and approved by the dust compliance group.

Complete: [x] Incomplete: [ ] N/A: [ ]

Item 20: The applicant needs to complete only those sections of the permit application that are applicable.

Complete: [x] Incomplete: [ ] N/A: [ ]

Notes to engineer:

- *Concerning Section Z: Many applicants will not be able to perform these engineering calculations. We will accept the permit application with a blank Section Z.*

Instructions for completing Sections A, B, C, D, E-1, E-2, F, G, H, I, J, K-1, K-2, K-3, K-4, L, M, X-1, X-2, Y and Z of the permit application are included at the beginning of each section and are self-explanatory.

In general, a material safety data sheet (MSDS) is required for each chemical used, stored or processed at the facility. Exceptions are for very common materials, such as gasoline, diesel, acetone, etc.

Business name: **Vulcan Materials Company – Avondale Plant**

Permit number: **090234**

Completeness review completed.
Application determined to be: Complete: [x] Incomplete: [ ]

Permit Engineer: **Casey Bryan** Date: _____

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