

Missouri Department of dnr.mo.gov

NATURAL RESOURCES

Michael L. Parson, Governor

Carol S. Comer, Director

DEC 13 2018

Mr. Stanley Thessen
SER Director
MFA Plant Foods - Palmyra
201 Ray Young Dr.
Columbia, MO 65201

RE: New Source Review Permit - Project Number: 2018-09-017

Dear Mr. Thessen:

Enclosed with this letter is your permit to construct. Please study it carefully and refer to Appendix A for a list of common abbreviations and acronyms used in the permit. Also, note the special conditions on the accompanying pages. The document entitled, "Review of Application for Authority to Construct," is part of the permit and should be kept with this permit in your files. Operation in accordance with these condition and your new source review permit application is necessary for continued compliance. The reverse side of your permit certificate has important information concerning standard permit conditions and your rights and obligations under the laws and regulations of the State of Missouri.

This permit may include requirements with which you may not be familiar. If you would like the department to meet with you to discuss how to understand and satisfy the requirements contained in this permit, an appointment referred to as a Compliance Assistance Visit (CAV) can be set up with you. To request a CAV, please contact your local regional office or fill out an online request. The regional office contact information can be found at the following website: <http://dnr.mo.gov/regions/>. The online CAV request can be found at <http://dnr.mo.gov/cav/compliance.htm>.

If you were adversely affected by this permit decision, you may be entitled to pursue an appeal before the administrative hearing commission pursuant to Sections 621.250 and 643.075.6 RSMo. To appeal, you must file a petition with the administrative hearing commission within thirty days after the date this decision was mailed or the date it was delivered, whichever date was earlier. If any such petition is sent by registered mail or certified mail, it will be deemed filed on the date it is mailed; if it is sent by any method other than registered mail or certified mail, it will be deemed filed on the date it is received by the administrative hearing commission, whose contact information is: Administrative Hearing Commission, United States Post Office Building, 131 West High Street, Third Floor, P.O. Box 1557, Jefferson City, Missouri 65102, phone: 573-751-2422, fax: 573-751-5018, website: www.oh.mo.gov/ahc.



Recycled paper

Mr. Stanley Thessen
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If you have any questions regarding this permit, please do not hesitate to contact Chad Stephenson, at the Department of Natural Resources' Air Pollution Control Program, P.O. Box 176, Jefferson City, MO 65102 or at (573) 751-4817. Thank you for your attention to this matter.

Sincerely,

AIR POLLUTION CONTROL PROGRAM



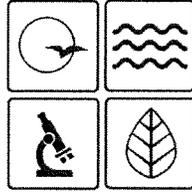
Susan Heckenkamp
New Source Review Unit Chief

SH:csj

Enclosures

c: Northeast Regional Office
PAMS File: 2018-09-017

Permit Number: 122018-009



MISSOURI
DEPARTMENT OF
NATURAL RESOURCES

MISSOURI AIR CONSERVATION COMMISSION

PERMIT TO CONSTRUCT

Under the authority of RSMo 643 and the Federal Clean Air Act the applicant is authorized to construct the air contaminant source(s) described below, in accordance with the laws, rules and conditions as set forth herein.

Permit Number: 122018-009 Project Number: 2018-09-017
Installation Number: 127-0005

Parent Company: MFA Incorporated

Parent Company Address: 201 Ray Young Dr., Columbia, MO 65201

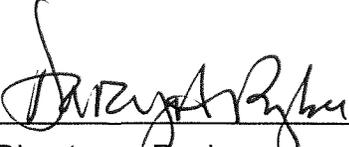
Installation Name: MFA Plant Foods - Palmyra

Installation Address: 2834 County Rd 359, Palmyra, MO 63461

Location Information: Marion County, S10, T58N, R5W

Application for Authority to Construct was made for:
New barge terminal facility. This review was conducted in accordance with Section (6),
Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*.

-
- Standard Conditions (on reverse) are applicable to this permit.
- Standard Conditions (on reverse) and Special Conditions are applicable to this permit.



Director or Designee
Department of Natural Resources

DEC 13 2018

Effective Date

STANDARD CONDITIONS:

Permission to construct may be revoked if you fail to begin construction or modification within two years from the effective date of this permit. Permittee should notify the Enforcement and Compliance Section of the Air Pollution Control Program if construction or modification is not started within two years after the effective date of this permit, or if construction or modification is suspended for one year or more.

You will be in violation of 10 CSR 10-6.060 if you fail to adhere to the specifications and conditions listed in your application, this permit and the project review. In the event that there is a discrepancy between the permit application and this permit, the conditions of this permit shall take precedence. Specifically, all air contaminant control devices shall be operated and maintained as specified in the application, associated plans and specifications.

You must notify the Enforcement and Compliance Section of the Department's Air Pollution Control Program of the anticipated date of start up of this (these) air contaminant source(s). The information must be made available within 30 days of actual startup. Also, you must notify the Department's regional office responsible for the area within which you are located within 15 days after the actual start up of this (these) air contaminant source(s).

A copy of the permit application and this permit and permit review shall be kept at the installation address and shall be made available to Department's personnel upon request.

You may appeal this permit or any of the listed special conditions to the Administrative Hearing Commission (AHC), P.O. Box 1557, Jefferson City, MO 65102, as provided in RSMo 643.075.6 and 621.250.3. If you choose to appeal, you must file a petition with the AHC within 30 days after the date this decision was mailed or the date it was delivered, whichever date was earlier. If any such petition is sent by registered mail or certified mail, it will be deemed filed on the date it is mailed. If it is sent by any method other than registered mail or certified mail, it will be deemed filed on the date it is received by the AHC.

If you choose not to appeal, this certificate, the project review and your application and associated correspondence constitutes your permit to construct. The permit allows you to construct and operate your air contaminant source(s), but in no way relieves you of your obligation to comply with all applicable provisions of the Missouri Air Conservation Law, regulations of the Missouri Department of Natural Resources and other applicable federal, state and local laws and ordinances.

The Air Pollution Control Program invites your questions regarding this air pollution permit. Please contact the Construction Permit Unit using the contact information below.

Contact Information:

Missouri Department of Natural Resources
Air Pollution Control Program
P.O. Box 176
Jefferson City, MO 65102-0176
(573) 751-4817

The regional office information can be found at the following website:

<http://dnr.mo.gov/regions/>

SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

The special conditions listed in this permit were included based on the authority granted the Missouri Air Pollution Control Program by the Missouri Air Conservation Law (specifically 643.075) and by the Missouri Rules listed in Title 10, Division 10 of the Code of State Regulations (specifically 10 CSR 10-6.060). For specific details regarding conditions, see 10 CSR 10-6.060 paragraph (12)(A)10. "Conditions required by permitting authority."

MFA Plant Foods - Palmyra
Marion County, S10, T58N, R5W

1. 12-Month Rolling PM₁₀ Emission Limit
 - A. MFA Plant Foods - Palmyra shall emit less than 15.0 tons of PM₁₀ in any consecutive 12-month period from the equipment in Table 1 while operating at this site.

Table 1: Project Emission Points

Emission Point	Description
BL-01	Grain receiving – hopper truck
BL-02	Grain handling - conveyors
BL-03	Grain shipping - barge
BHR-1a	Barge Haul Road - paved
BHR-1b	Barge Haul Road - unpaved

- B. MFA Plant Foods - Palmyra shall demonstrate compliance with Special Condition 1.A using Attachment A or another equivalent form that has been approved by the Air Pollution Control Program, including an electronic form.
2. Record Keeping and Reporting Requirements
 - A. MFA Plant Foods - Palmyra shall maintain all records required by this permit for not less than five years and shall make them available immediately to any Missouri Department of Natural Resources' personnel upon request.
 - B. MFA Plant Foods - Palmyra shall report to the Air Pollution Control Program's Compliance/Enforcement Section, by mail at P.O. Box 176, Jefferson City, MO 65102 or by email at AirComplianceReporting@dnr.mo.gov, no later than 10 days after the end of the month during which any record required by this permit shows an exceedance of a limitation imposed by this permit.

REVIEW OF APPLICATION FOR AUTHORITY TO CONSTRUCT AND OPERATE
SECTION (6) REVIEW

Project Number: 2018-09-017

Installation ID Number: 127-0005

Permit Number: 122018 - 009

Installation Address:

MFA Plant Foods - Palmyra
2834 County Rd 359
Palmyra, MO 63461

Parent Company:

MFA Incorporated
201 Ray Young Dr.
Columbia, MO 65201

Marion County, S10, T58N, R5W

REVIEW SUMMARY

- MFA Plant Foods - Palmyra has applied for authority to operate a new barge terminal facility.
- The application was deemed complete on October 1, 2018.
- HAP emissions are not expected from the proposed equipment.
- None of the New Source Performance Standards (NSPS) apply to the proposed equipment. Subpart DD of the New Source Performance Standards (NSPS), *Standards of Performance for Grain Elevators*, does not apply to this installation since the storage capacity of the installation is less than 2.5 million bushels of grain.
- None of the NESHAPs apply to this installation. None of the currently promulgated MACT regulations apply to the proposed equipment.
- No air pollution control equipment is being used in association with the new equipment.
- This review was conducted in accordance with Section (6) of Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*. Potential emissions of PM₁₀ and PM_{2.5} are conditioned below the de minimis level by the voluntary production limit. Potential emissions PM are above de minimis levels but below the major source level.
- This installation is located in Marion County, an attainment/unclassifiable area for all criteria pollutants.
- This installation is not on the List of Named Installations found in 10 CSR 10-6.020(3)(B), Table 2. The installation's major source level is 250 tons per year and fugitive emissions are not counted toward major source applicability.

- Ambient air quality modeling was not performed since potential emissions of the application are below de minimis levels. PM emissions exceed the de minimis level; however, no PM NAAQS has been established to model against.
- Emissions testing is not required for the equipment as a part of this permit. Testing may be required as part of other state, federal or applicable rules.
- A Basic Operating Permit is required for this installation.
- Approval of this permit is recommended with special conditions.

INSTALLATION DESCRIPTION

MFA Plant Foods – Palmyra operates a distribution center for agricultural fertilizers situated in Marion County. Dry bulk fertilizer is currently received by either barge or railcar. All fertilizer received by barge is conveyed to the appropriate buildings. When fertilizer is received from the railcars it is unloaded onto conveyors that feed bucket elevators that feed overhead conveyors for filling the various product storage bays inside the buildings. Product received from barge currently can also be loaded directly into trucks.

There are three storage buildings for storage of fertilizer products providing 23,200 tons of storage capacity. These are designated as a dome with a storage capacity of approximately 18,000 tons; building 300 with a storage capacity of approximately 9,000 tons; and building 900 with a storage capacity of approximately 10,800 tons. The individual fertilizer products that are handled are: urea, dap, map, red potash, white potash, mesz, and Super U.

MFA Plant Foods – Palmyra is an existing de minimis source of pollutants according to construction permits. A basic state operating permit application will be required within 30 days of issuance of this permit. The following construction permits have been issued to MFA Plant Foods – Palmyra from the Air Pollution Control Program.

The following New Source Review permits have been issued to MFA Plant Foods - Palmyra from the Air Pollution Control Program.

Table 2: Permit History

Permit Number	Description
0489-002	A de minimis fertilizer distribution center
0896-022	Sect. (5) permit to increase production, establishing 15 ton per year limit on PM ₁₀
102004-009	A fill conveyor system

PROJECT DESCRIPTION

This project is for new barge loading equipment. There will be one haul road (BHR-01) that is approximately 965 feet unpaved and 940 feet paved. The equipment will consist of grain truck unloading (BL-01), grain handling conveyors (BL-02), and barge loading (BL-03). The equipment is rated at 260 tons per hour. The equipment will be powered by the local electric utility. There will be no associated storage piles since it will be direct transfer from truck to conveyors.

EMISSIONS/CONTROLS EVALUATION

Emissions for the project were calculated as described below and using emission factors found in the United States EPA document *AP-42 Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources*, Fifth Edition (AP-42). Grain receiving was assumed to occur through a 50/50 split of straight trucks and hopper trucks. This is a conservative assumption as the emission factor for straight truck receiving is higher than the emission factor for hopper bottom receiving and the trend in the industry is moving towards more hopper bottom trucks compared to straight trucks.

Emissions from the grain unloading and handling and barge shipping equipment:

- Calculated using emission factors from AP-42 Section 9.9.1 "Grain Elevators & Processes," May 2003.

Emissions from haul roads and vehicular activity areas:

- Calculated using the predictive equation from AP-42 Section 13.2.1 "Paved Roads," January 2011 and AP-42 Section 13.2.2 "Unpaved Roads," November 2006. A silt loading of 1.1 g/m² was used for the paved roads. A surface material silt content of 8.3% was used for the unpaved roads. The average truck weight used was 27.5 tons.

The following table provides an emissions summary for this project. Existing potential emissions were taken from permit 102004-009. Existing actual emissions were taken from the installation's 2017 EIQ. Potential emissions of the application represent the potential of the new equipment, assuming continuous operation (8760 hours per year). Conditioned potential emissions account for a voluntary PM₁₀ de minimis limit to avoid modeling.

Table 3: Emissions Summary (tpy)

Pollutant	Regulatory <i>De Minimis</i> Levels	Existing Potential Emissions	Existing Actual Emissions (2017 EIQ)	Potential Emissions of the Project	Project Conditioned Potential
PM	25.0	N/D	N/D	337.25	43.23
PM ₁₀	15.0	< 30.0	6.08	117.02	<15.0
PM _{2.5}	10.0	N/D	0.95	17.62	2.26
SO _x	40.0	N/D	N/A	N/A	N/A
NO _x	40.0	N/D	N/A	N/A	N/A
VOC	40.0	N/D	N/A	N/A	N/A
CO	100.0	N/D	N/A	N/A	N/A
HAPs	10.0/25.0	N/D	N/A	N/A	N/A

N/A = Not Applicable; N/D = Not Determined

PERMIT RULE APPLICABILITY

This review was conducted in accordance with Section (6) of Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*. Potential emissions of PM₁₀ and PM_{2.5} are conditioned below the de minimis level. Potential emissions PM are above de minimis levels but below the major source level.

APPLICABLE REQUIREMENTS

MFA Plant Foods - Palmyra shall comply with the following applicable requirements. The Missouri Air Conservation Laws and Regulations should be consulted for specific record keeping, monitoring, and reporting requirements. Compliance with these emission standards, based on information submitted in the application, has been verified at the time this application was approved.

GENERAL REQUIREMENTS

- *Start-Up, Shutdown, and Malfunction Conditions*, 10 CSR 10-6.050
- *Submission of Emission Data, Emission Fees and Process Information*,
- 10 CSR 10-6.110
 - Per 10 CSR 10-6.110(4)(B)2.B(II) and (4)(B)2.C(II) a full EIQ is required for the first full calendar year the equipment (or modifications) approved by this permit are in operation.
- *Restriction of Particulate Matter to the Ambient Air Beyond the Premises of Origin*, 10 CSR 10-6.170

- *Restriction of Emission of Visible Air Contaminants*, 10 CSR 10-6.220
- *Restriction of Emission of Odors*, 10 CSR 10-6.165

STAFF RECOMMENDATION

On the basis of this review conducted in accordance with Section (6), Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*, it is recommended that this permit be granted with special conditions.

PERMIT DOCUMENTS

The following documents are incorporated by reference into this permit:

- The Application for Authority to Construct form, dated September 13, 2018, received September 14, 2018, designating MFA Incorporated as the owner and operator of the installation.

APPENDIX A

Abbreviations and Acronyms

%	percent	Mgal	1,000 gallons
°F	degrees Fahrenheit	MW	megawatt
acfm	actual cubic feet per minute	MHDR	maximum hourly design rate
BACT	Best Available Control Technology	MMBtu	Million British thermal units
BMPs	Best Management Practices	MMCF	million cubic feet
Btu	British thermal unit	MSDS	Material Safety Data Sheet
CAM	Compliance Assurance Monitoring	NAAQS	National Ambient Air Quality Standards
CAS	Chemical Abstracts Service	NESHAPs	National Emissions Standards for Hazardous Air Pollutants
CEMS	Continuous Emission Monitor System	NO_x	nitrogen oxides
CFR	Code of Federal Regulations	NSPS	New Source Performance Standards
CO	carbon monoxide	NSR	New Source Review
CO₂	carbon dioxide	PM	particulate matter
CO_{2e}	carbon dioxide equivalent	PM_{2.5}	particulate matter less than 2.5 microns in aerodynamic diameter
COMS	Continuous Opacity Monitoring System	PM₁₀	particulate matter less than 10 microns in aerodynamic diameter
CSR	Code of State Regulations	ppm	parts per million
dscf	dry standard cubic feet	PSD	Prevention of Significant Deterioration
EQ	Emission Inventory Questionnaire	PTE	potential to emit
EP	Emission Point	RACT	Reasonable Available Control Technology
EPA	Environmental Protection Agency	RAL	Risk Assessment Level
EU	Emission Unit	SCC	Source Classification Code
fps	feet per second	scfm	standard cubic feet per minute
ft	feet	SDS	Safety Data Sheet
GACT	Generally Available Control Technology	SIC	Standard Industrial Classification
GHG	Greenhouse Gas	SIP	State Implementation Plan
gpm	gallons per minute	SMAL	Screening Model Action Levels
gr	grains	SO_x	sulfur oxides
GWP	Global Warming Potential	SO₂	sulfur dioxide
HAP	Hazardous Air Pollutant	SSM	Startup, Shutdown & Malfunction
hr	hour	tph	tons per hour
hp	horsepower	tpy	tons per year
lb	pound	VMT	vehicle miles traveled
lbs/hr	pounds per hour	VOC	Volatile Organic Compound
MACT	Maximum Achievable Control Technology		
µg/m³	micrograms per cubic meter		
m/s	meters per second		

Activity	MHDR		Truck Types				We*	Wf*
	(tons/hr)	(trips/hr)	Hopper	Truck	type	type		
1a	260.0	10.400	100%				15	40
1b	260.0	10.400	100%				15	40
title	0.000						0	0
title	0.000						0	0
title	0.000						0	0
title	0.000						0	0
title	0.000						0	0
title	0.000						0	0
title	0.000						0	0

Truck Type	We (tons)	Wf (tons)
Hopper	15	40
Truck	15	39
type		
type		

truck type row must sum to 100% per each activity

1=empty
 2=full
 3=both

Road Segment ID	1	2	3	4	5	6	7	8
D one way (feet)	966	940						
D one way (miles)	0.183	0.178						
1a	3							
1b		3						
title								
title								
title								
title								
title								
title								

Activities

1a	27.500	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1b	0.000	27.500	0.000	0.000	0.000	0.000	0.000	0.000
title	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
title	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
title	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
title	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
title	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
title	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
title	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
W	27.50	27.50	0.00	0.00	0.00	0.00	0.00	0.00

W

Surface	Unpaved	Paved	Unpaved	Unpaved	Unpaved	Unpaved	Unpaved	Unpaved
---------	---------	-------	---------	---------	---------	---------	---------	---------

E(PM2.5) (lbs/VMT)	0.29174	0.01731						
E(PM10) (lbs/VMT)	2.91738	0.07050						
E(PM30) (lbs/VMT)	10.2593	0.35252						
Eext(PM2.5) (lbs/VMT)	0.20781	0.01606						
Eext(PM10) (lbs/VMT)	2.07814	0.06543						
Eext(PM30) (lbs/VMT)	7.30802	0.32716						

1a	3.8064	0	0	0	0	0	0	0
1b	0	3.70303	0	0	0	0	0	0
title	0	0	0	0	0	0	0	0
title	0	0	0	0	0	0	0	0
title	0	0	0	0	0	0	0	0
title	0	0	0	0	0	0	0	0
title	0	0	0	0	0	0	0	0
title	0	0	0	0	0	0	0	0
title	0	0	0	0	0	0	0	0
MHDR	3.8064	3.70303	0	0	0	0	0	0

MHDR

PTE PM2.5 (lb/hr)	1.11047	0.064082						
PTE PM10 (lb/hr)	11.1047	0.261076						
PTE PM30 (lb/hr)	39.0511	1.305379						
PTE PM2.5 (lb/hr) w/ rain	0.79102	0.059474						
PTE PM10 (lb/hr) w/ rain	7.91022	0.2423						
PTE PM30 (lb/hr) w/ rain	27.8172	1.211499						
PTE PM2.5 (tons/yr)	4.86387	0.28068						
PTE PM10 (tons/yr)	48.6387	1.143512						
PTE PM30 (tons/yr)	171.044	5.71756						
PTE PM2.5 (tons/yr) w/ rain	3.46468	0.260494						
PTE PM10 (tons/yr) w/ rain	34.6468	1.061273						
PTE PM30 (tons/yr) w/ rain	121.839	5.306366						

PTE (lb/hr)

PTE (tons/yr)

Potential	Conditioned
3.73	PM2.5
35.71	PM10
127.15	PM

Haul Road/Haul Truck/Material Hauled Information								
Haul Road ID No.:	1	1a	3	4	5	6	7	8
W (tons)	0.00	27.50	0.00	0.00	0.00	0.00	0.00	0.00
sL (g/m ²):	1.1	1.1						
P:	105	105	105	105	105	105	105	105
N:	365	365	365	365	365	365	365	365
Haul Roads - Max Hourly VMT Rate and Emission Factor Calculations								
E(PM _{2.5})(lbs/VMT):	0.0000	0.0173						
E(PM ₁₀)(lbs/VMT):	0.0000	0.0705						
E(PM ₃₀)(lbs/VMT):	0.0000	0.3525						
Eext(PM _{2.5})(lbs/VMT):	0.0000	0.0161						
Eext(PM ₁₀)(lbs/VMT):	0.0000	0.0654						
Eext(PM ₃₀)(lbs/VMT):	0.0000	0.3272						

$E = k(sL)^{0.91} * (W)^{1.02}$ where:

E = particulate emission factor (having units matching the units of k)

k = particle size multiplier for particle size range and units of interest

sL = road surface silt loading (grams per square meter) (g/m²)

W = average weight (tons) of the vehicles traveling the road

Table 13.2.1-1 PARTICLE SIZE MULTIPLIERS FOR PAVED ROAD EQUATION

Size range	k (lb/VMT)
PM2.5	0.00054
PM10	0.0022
PM15	0.0027
PM30	0.011

$E_{ext} = [k(sL)^{0.91} * (W)^{1.02}](1-P/(4N))$ where:

k, sL, W and S are as defined above and

Eext = annual average emission factor in the same units as k

P = number of "wet" days with at least 0.01 inch of precipitation during the averaging period

N = number of days in the averaging period (365 for annual)

The equations retain the quality rating of A (D for PM2.5), if applied within the range of source conditions that were

Silt loading:

0.03-400 g/m²

0.04-570 grains/square foot (ft²)

Mean vehicle weight:

1.8-38 megagrams (Mg)

2.0-42 tons

Mean vehicle speed:

1-88 kilometers per hour (kph)

1-55 miles per hour (mph)

The upper 95% confidence levels of equation 1 for PM10 is best described with equations using an exponent of 1.14

$E_{95\%} = k(sL)^{1.14} * (W)^{1.19}$

E95%(PM_{2.5})(lbs/VMT): 0.0000 0.0311

E95%(PM₁₀)(lbs/VMT): 0.0000 0.1266

Haul Road/Haul Truck/Material Hauled Information								
Haul Road ID No.:	1b	2	3	4	5	6	7	8
W (tons):	27.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00
s (%):	8.3	8.3						
P (days):	105	105	105	105	105	105	105	105
E(PM2.5) (lbs/VMT):	0.2917	0.0000						
E(PM10) (lbs/VMT):	2.9174	0.0000						
E(PM30) (lbs/VMT):	10.2593	0.0000						
Eext(PM2.5) (lbs/VMT):	0.2078	0.0000						
Eext(PM10) (lbs/VMT):	2.0781	0.0000						
Eext(PM30) (lbs/VMT):	7.3080	0.0000						

$E = k (s/12)^a * (W/3)^b$ where:

E = size-specific emission factor (lb/VMT)

s = surface material silt content (%)

W = mean vehicle weight (tons)

Constants for Equation

Particle Size	k(lb/VMT)	Constant	
		a	b
PM2.5	0.15	0.9	0.45
PM10	1.5	0.9	0.45
PM30	4.9	0.7	0.45

$E_{ext} = E[(365-P)/365]$ where E is defined above and:

Eext = annual size-specific emission factor extrapolated for natural mitigation (lb/VMT)

P = number of days in a year with at least 0.01 inch of precipitation