Middletown Coke Company
Application for Permit to Install

Addendum 1

April 2008

Prepared for:

SunCoke Energy, Inc.
Parkside Plaza
11400 Parkside Drive
Knoxville, Tennessee 37934

MIDDLETOWN COKE COMPANY
APPLICATION FOR PERMIT TO INSTALL

ADDENDUM 1

Prepared for:

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Knoxville, TN 37934

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April 2008

1.0 INTRODUCTION

Middletown Coke Company submitted an application for a permit to install a heat recovery coke plant adjacent to AK Steel Corporation's (AK's) Middletown Works in Middletown, Ohio on February 12, 2008. The purpose of this addendum is to revise that application with an updated layout and modifications to material handling.

Revised forms are included as Appendix A. Supporting calculations are included as Appendix B.

2.0 REVISED LAYOUT

The revised layout for the facility is shown in Figure 1. This is a revision of Figure 2-5 from the initial application. The main modifications include: rail layout, smaller coal storage piles, relocation of emergency run of oven coke storage pile, and the addition of small emergency ground storage for screened coke and coke breeze. The screened coke and breeze piles are for short-term emergencies (e.g., if a conveyor belt breaks or trucks cannot get to the site to pick up the breeze). Figure 2 is the modified coke processing flow diagram, which is a revision of Figure 2-4 from the initial application. Table 1 summarizes the modifications to the permit application. There are no modifications to coal charging, coal carbonization (coking), coke pushing, or coke quenching.

3.0 AIR EMISSIONS

Overall, these modifications result in a small reduction of fugitive emissions. Particulate matter (PM) is reduced by approximately 0.3 tons/year and particulate matter less than 10 micrometers in diameter (PM_{10}) is reduced by approximately 0.2 ton/year. Table 2 shows the distribution of potential emissions. Table 2 is a revision of Table 4-1 from the initial application.

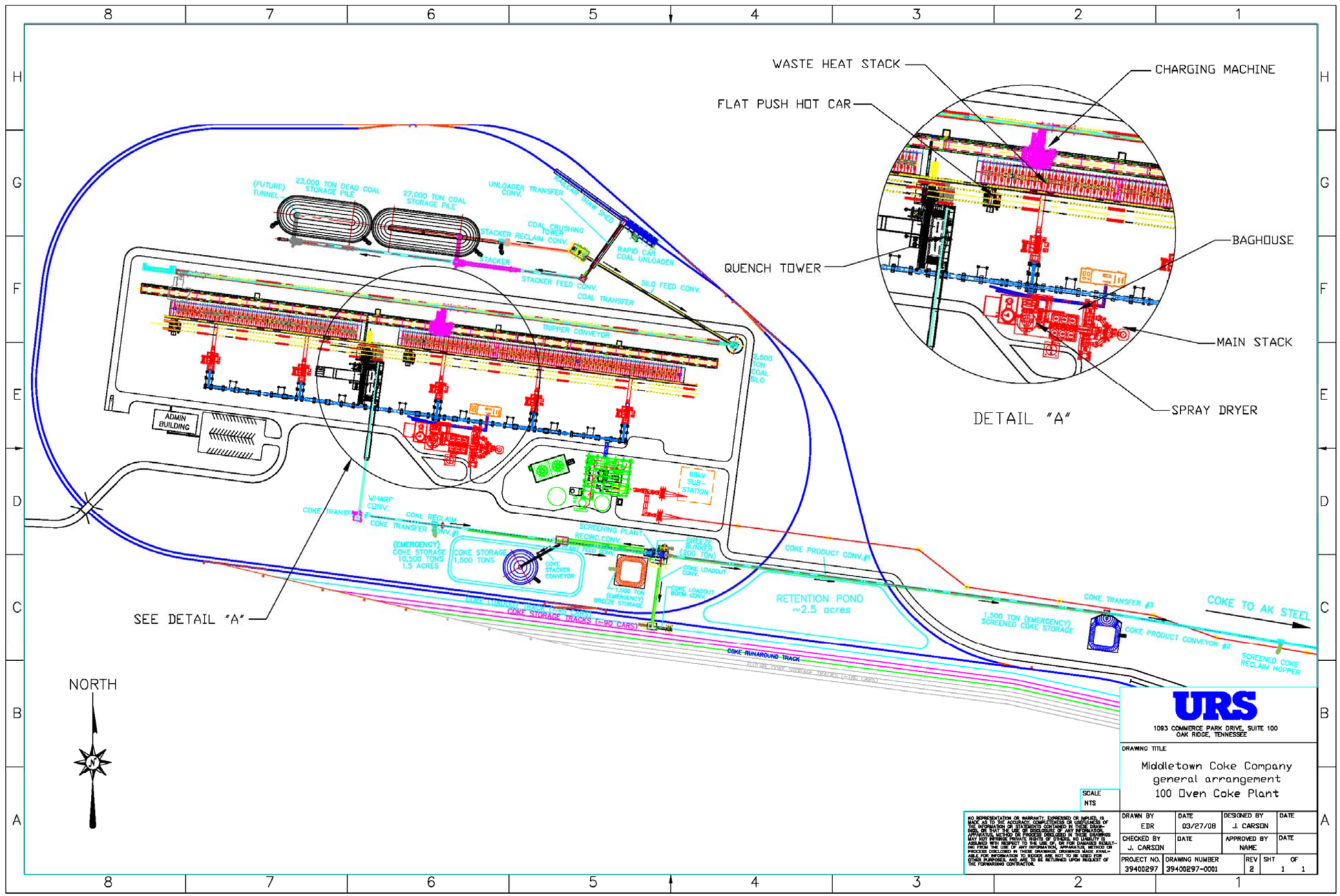

Figure 1. MCC 100 Oven Coke Plant

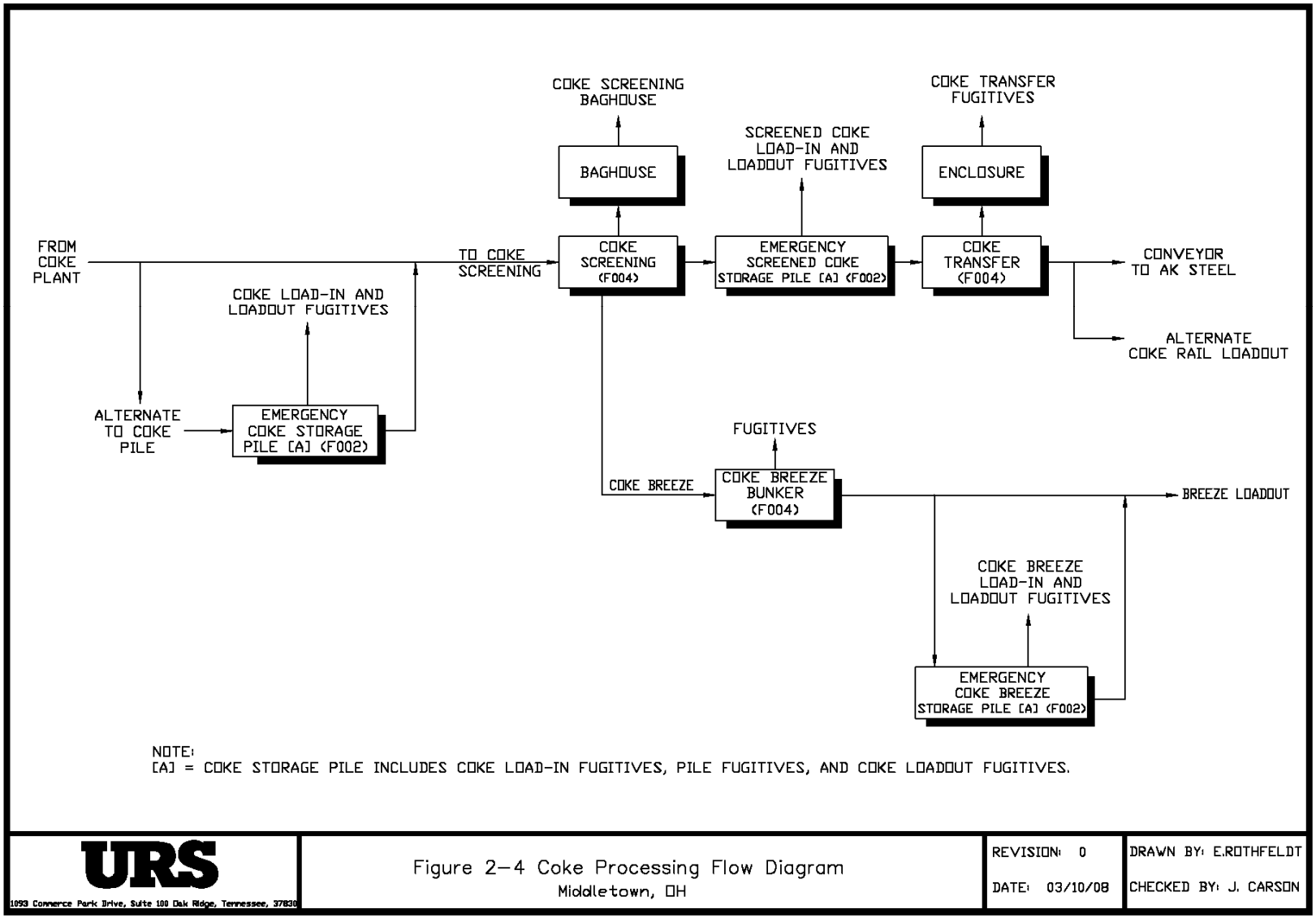

Figure 2. Coke Processing Flow Diagram

Table 1

MCC Material Handling Revisions

Source ID	Description	Initial Permit Application	Addendum 1
F002	Coal and Coke Storage Piles	1. Coal Storage Piles • 1.22 ac. each (5 piles) 2. Emergency Coke Storage Pile • 1.5 ac.	1. Coal Storage Piles • 1.2 ac. (Coal Pile #1) • 1.3 ac. (Coal Pile #2) 2. Emergency Run of Oven Coke Storage Pile • 1.5 ac. 3. Emergency Coke Breeze Storage Pile • 0.2 ac. 4. Emergency Screened Coke Storage Pile • 0.3 ac.
F003	Coal Handling, Processing, and Transfer	1. Coal Unloading 2. Coal Crushing 3. Coal Transfer • 14 enclosed coal transfer points • 6 unenclosed coal transfer points	1. Coal Unloading 2. Coal Crushing 3. Coal Transfer • 9 enclosed coal transfer points • 6 unenclosed coal transfer points
F004	Coke Handling, Processing, and Transfer	1. Coke Rail Loadout 2. Coke Breeze Bin Loadout 3. Coke Screening 4. Coke Transfer • 15 enclosed coke transfer points • 4 unenclosed coke transfer points • 1 partially enclosed coke transfer point	1. Coke Rail Loadout 2. Coke Breeze Bin Loadout 3. Coke Screening 4. Coke Transfer • 17 enclosed coke transfer points • 4 unenclosed coke transfer points • 1 partially enclosed coke transfer point

Table 2

Maximum MCC Emissions

Emissions Unit	Designation	Associated Control Device[a]	TSP (tons/year)	PM_{10} (tons/year)	SO_2 (tons/year)	NO_x (tons/year)	CO (tons/year)	VOCs (tons/year)	Lead (tons/year)	Sulfuric Acid (tons/year)
Fugitive emissions	Coal unloading, storage, handling and processing	WS, E	10.12	4.87	—	—	—	—	—	—
Thaw shed	Thaw shed	Heat with natural gas	0.07	0.07	0.01	0.98	0.82	0.05	—	—
Coal charging	Charge	Traveling hood with baghouse	7.95	7.09	0.14	—	1.28	0.91	0.00005	—
Heat recovery coking	Coking (main stack)	Baghouse, common tunnel afterburner, and lime spray dryer	131.40	131.40	1091.35	456.25	95.54	20.47	0.10	11.13
Heat recovery coking	Coking (individual waste heat stacks)	Common tunnel afterburner	32.01	32.01	448.50	18.75	3.93	0.84	0.09	22.88
Coke pushing	Pushing	Flat push and traveling hood with multicyclone	26.18	26.18	44.71	8.67	28.74	9.13	0.007	2.28
Coke quenching	Quench	Baffles, with TDS control water	54.75	20.08	—	—	—	—	0.04	—
Coke screening	Processing	Baghouse, E	15.02	15.02	—	—	—	—	—	—
Fugitive emissions	Coke handling, storage, and loadout	WS, E	8.34	3.98	—	—	—	—	—	—
Fugitive emissions	Industrial roads	Paving, W, GH	15.48	3.02	—	—	—	—	—	—
Other fugitive emissions	FGD dust and lime silo	Bin vent	0.14	0.14	—	—	—	—	—	—
Total Emissions			301.47	243.85	1584.71	484.65	130.31	31.41	0.24	36.29

Revised emissions are highlighted.

[a] W = watering as needed, E = enclosure, GH = good housekeeping, WS = wet suppression or wet material

CO = Carbon Monoxide
FGD = Flue Gas Desulfurization
MCC = Middletown Coke Company
NO_x = Nitrogen Oxides
PM_{10} = Particulate matter less than 10 micrometers in diameter
SO_2 = Sulfur Dioxide
TDS = Total Dissolved Solids
TSP = Total Suspended Particulates
VOC = Volatile Organic Compound

Appendix A
REVISED FORMS

Ohio Environmental Protection Agency
Lazarus Government Center
P.O. Box 1049
Columbus, Ohio 43216-1049

For EPA Use Only
Application
Or ID Number_____

Date Received _____

Check No. _____ Check ID No. _____

Check Date _____ Amount _____

Revenue ID No. _____

- ❑ DAPC
- ❑ DDAGW
- ❑ DHWM
- ❑ DSW
- ❑ DSIWM
- ❑ RTK
- ❑ DEFA
- ❑ TRI
- ❑ _____

GENERAL COVER SHEET

1. Facility Information

Core Place ID	
Legal Name	Middletown Coke Company
Alternate Name	NA
Street Address	7014 Hamilton Middletown Road
City/State/Zip	Middletown, OH 45044
Location	
County	Butler

2. Owner Information

Owner Name	Sun Coke Energy
Effective Date	
Mailing Address	Parkside Plaza
	11400 Parkside Drive
City/State/Zip	Knoxville, TN 37934
Phone Number	865 – 288 5200
Billing Address	Same as Above
City/State/Zip	

3. Operator Information

Operator Name	Same as Owner
Effective Date	
Mailing Address	
City/State/Zip	
Phone Number	
Billing Address	
City/State/Zip	

4. Division/Program Specific Secondary ID Numbers (for existing facilities only)

DAPC	Facility ID	
DAPC	TRI ID	
DDAGW	PWS ID	
DHWM	RCRA ID	
DSW	NPDES ID	
DSIWM	Facility ID	
RTK	RTK ID	
Other	(_____)	

5. Supplemental Information

Primary SIC Code	3312
Primary NAICS Code	324199
D&B D-U-N-S No.	021562483
Lat./Long.	84.4105 W 39.4732 N
Point Description	Heat Recovery Coke Plant (100 Ovens)

Section I - General Permit To Install (PTI) Application Information

This section should be filled out for each permit to install (PTI) application. A PTI is required for all air contaminant sources (emissions units) installed or modified after 1/1/74. See the line by line PTI instructions for additional information.

1. State the reason(s) for the application.

☒ new installation (for which construction has not yet begun)
☐ initial application for an air contaminant source already installed or under construction
☐ modification to an existing air contaminant source/facility - List previous PTI number(s) for air contaminant sources included in this application, if applicable, and describe requested modification (attach an additional sheet, if necessary):

_____

☐ reconstruction of an existing air contaminant source/facility. Please explain:

_____
☐ startup of an air contaminant source/facility that has been shutdown for _____ years.
☐ other, please explain: _____

2. Please check the appropriate boxes below. If you check exempt/not subject, explain why.

☐ not affected ☒ subject to Subpart: Y **New Source Performance Standards (NSPS)**
☐ exempt/not subject - explain below
☐ unknown

New Source Performance Standards are listed under 40 CFR 60 - Standards of Performance for New Stationary Sources.

☒ not affected ☐ subject to Subpart: _____ **National Emission Standards for Hazardous Air Pollutants (NESHAPS)**
☐ exempt/not subject - explain below
☐ unknown

National Emissions Standards for Hazardous Air Pollutants are listed under 40 CFR 61. (These include asbestos, benzene, beryllium, mercury, and vinyl chloride).

☐ not affected ☒ subject to Subpart: L and CCCCC **Maximum Achievable Control Technology (MACT)**
☐ exempt/not subject - explain below
☐ unknown

The Maximum Achievable Control Technology standards are listed under 40 CFR 63 and OAC rule 3745-31-28.

☒ not affected ☐ subject to regulation **Prevention of Significant Deterioration (PSD)**
☐ unknown

These rules are found under OAC rule 3745-31-10 through OAC rule 3745-31-20.

☒ not affected ☐ subject to regulation **Non-Attainment New Source Review**
☐ unknown

These rules are found under OAC rule 3745-31-21 through OAC rule 3745-31-27.

Please describe any of the above applicable rules and/or exemptions. Identify whether they apply to the entire facility and/or to specific air contaminant sources included in this PTI application (attach additional page if necessary):

Section I - General Permit To Install (PTI) Application Information

3. Do you qualify for permit to install registration status as determined by Ohio Administrative Code(OAC) rule 3745-31-05?

☐ yes
☒ no

If yes, are you requesting registration status per OAC rule 3745-31-05?

☐ yes
☒ no

4. Is any information included in this application being claimed as a trade secret per Ohio Revised Code (ORC) 3704.08?

WARNING: IF YOU ARE SENDING YOUR PTI APPLICATION ELECTRONICALLY, E-MAIL IS NOT A SECURE METHOD TO TRANSFER DATA. IF YOUR PTI APPLICATION CONTAINS CONFIDENTIAL INFORMATION YOU MAY NOT WANT TO SEND IT USING E-MAIL. OHIO EPA IS NOT RESPONSIBLE FOR ANY BREACH OF SECURITY THAT MAY OCCUR DURING ELECTRONIC TRANSMISSION OF THE E-MAIL.

☐ yes (A "non-confidential" version must be submitted in order for this application to be deemed complete.)
☒ no

5. Person to contact for this application:

Delauna Pack — Director Corporate Health, Environmental, and Safety
Name — Title

Parkside Plaza, 11400 Parkside Drive, Knoxville, TN 37934

Address (Street, City/Township, State and Zip Code)

(865) 288-5200 — Phone
(865) 288-5280 — Fax
DPACK@sunocoinc.com — E-mail

6. Authorized Signature: Under OAC rule 3745-31-04, this signature shall constitute personal affirmation that all statements or assertions of fact made in the application are true and complete, comply fully with applicable state requirements, and shall subject the signatory to liability under applicable state laws forbidding false or misleading statements.

_____ _____

Authorized Signature (for facility) — Date

Michael J. Thomson, Executive VP and COO
Title

OAC rule 3745-31-04 states that applications for permits to install shall be signed:

(1) In the case of a corporation, by a principal executive officer of at least the level of vice president, or his duly authorized representative, if such representative is responsible for the overall operation of the facility.

(2) In the case of a partnership by a general partner.

(3) In the case of sole proprietorship, by the proprietor, and

(4) In the case of a municipal, state, federal or other governmental facility, by the principal executive officer, the ranking elected official, or other duly authorized employee.

Section II - Specific Air Contaminant Source Information **REVISED APRIL 2008**

NOTE: One copy of this section should be filled out for each air contaminant source covered by this PTI application. See the line by line PTI instructions for additional information.

1. Company identification (name for air contaminant source for which you are applying): Coal and Coke Storage Piles (F002)

2. List all equipment that are part of this air contaminant source: Open coal storage piles, emergency coke ground storage pile, emergency coke breeze storage pile, and emergency screened coke pile.

3. Air Contaminant Source Installation or Modification Schedule (must be completed regardless of date of installation or modification):

   When did/will you begin to install or modify the air contaminant source? (month/year) June 2008

   When did/will you begin to operate the air contaminant source? (month/year) December 2009 **OR** after issuance of PTI

   _____

4. Emissions Information: The following table requests information needed to determine the applicable requirements and the compliance status of this air contaminant source with those requirements. Suggestions for how to estimate emissions may be found in the instructions to the Emissions Activity Category (EAC) forms required with this application. If you need further assistance, contact your Ohio EPA permit representative.

   - If total potential emissions of HAPs or any Air Toxic is greater than 1 ton/yr, fill in the table for that (those) pollutant(s). For all other pollutants, if "Emissions before controls (max), lb/hr" multiplied by 24 hours/day is greater than 10 lb/day, fill in the table for that pollutant.
   - If you have no add-on control equipment, "Emissions before controls= will be the same as "Actual emissions"
   - Annual emissions should be based on operating 8760 hr/yr unless you are requesting operating restrictions to limit emissions in line # 8 or have described inherent limitations below.
   - If you use units other than lb/hr or ton/yr, specify the units used (e.g., gr/dscf, lb/ton charged, lb/MMBtu, ton/12-months).
   - Requested Allowable (ton/yr) is often equivalent to Potential to Emit (PTE) as defined in OAC rule 3745-31-01 and OAC rule 3745-77-01.

Pollutant	Emissions before controls (max) (lb/hr)	Actual emissions (lb/hr)	Actual emissions (ton/year)	Requested Allowable (lb/hr)	Requested Allowable (ton/year)
Particulate emissions (PE) (formerly particulate matter, PM)			7.51		7.51
PM_{10} (PM < 10 microns in diameter)			3.64		3.64
Sulfur dioxide (SO_2)					
Nitrogen oxides (NO_x)					
Carbon monoxide (CO)					
Organic compounds (OC)					
Volatile organic compounds (VOC)					
Total HAPs					
Highest single HAP:					
Air Toxics (see instructions):					

Provide your calculations as an attachment and explain how all process variables and emission factors were selected. Note the emissions factor(s) employed and document the origin. Example: AP-42, Table 4.4-3 (8/97); stack test, Method 5, 4/96; mass balance based on MSDS; etc.

5. **Does this air contaminant source employ emissions control equipment?**

☒ **Yes** - fill out the applicable information below.

☐ **No** - proceed to item # 6.

Note: Pollutant abbreviations used below: Particulates = PE; Organic compounds = OC; Sulfur dioxide = SO_2; Nitrogen oxides = NOx; Carbon monoxide = CO

☐ **Cyclone/Multiclone**

Manufacturer: _____ Year installed: _____
What do you call this control equipment: _____
Pollutant(s) controlled: ☐ PE ☐ OC ☐ SO_2 ☐ NOx ☐ CO ☐ Other _____
Estimated capture efficiency (%): _____ Basis for efficiency: _____
Design control efficiency (%):_____ Basis for efficiency: _____
Type: ☐ Cyclone ☐ Multiclone ☐ Rotoclone ☐ Other _____
☐ This is the only control equipment on this air contaminant source
If no, this control equipment is: ☐ Primary ☐ Secondary ☐ Parallel
List any other air contaminant sources that are also vented to this control equipment:
_____

☐ **Fabric Filter/Baghouse**

Manufacturer: _____ Year installed: _____
What do you call this control equipment: _____
Pollutant(s) controlled: ☐ PE ☐ OC ☐ SO_2 ☐ NOx ☐ CO ☐ Other _____
Estimated capture efficiency (%):_____ Basis for efficiency: _____
Design control efficiency (%):_____ Basis for efficiency: _____
Operating pressure drop range (inches of water): Minimum: _____Maximum: _____
Pressure type: ☐ Negative pressure ☐ Positive pressure
Fabric cleaning mechanism: ☐ Reverse air ☐ Pulse jet ☐ Shaker ☐ Other _____
☐ Lime injection or fabric coating agent used: Type: _____ Feed rate: _____
☐ This is the only control equipment on this air contaminant source
If no, this control equipment is: ☐ Primary ☐ Secondary ☐ Parallel
List any other air contaminant sources that are also vented to this control equipment:
_____

☐ **Wet Scrubber**

Manufacturer: _____ Year installed: _____
What do you call this control equipment: _____
Pollutant(s) controlled: ☐ PE ☐ OC ☐ SO_2 ☐ NOx ☐ CO ☐ Other _____
Estimated capture efficiency (%):_____ Basis for efficiency: _____
Design control efficiency (%):_____ Basis for efficiency: _____
Type: ☐ Spray chamber ☐ Packed bed ☐ Impingement ☐ Venturi ☐ Other _____
Operating pressure drop range (inches of water): Minimum: _____ Maximum: _____
pH range for scrubbing liquid: Minimum: _____ Maximum: _____
Scrubbing liquid flow rate (gal/min): _____
Is scrubber liquid recirculated? ☐ Yes ☐ No
Water supply pressure (psig): _____ NOTE: This item for spray chambers only.
☐ This is the only control equipment on this air contaminant source
If no, this control equipment is: ☐ Primary ☐ Secondary ☐ Parallel
List any other air contaminant sources that are also vented to this control equipment:
_____

☐ **Electrostatic Precipitator**

Manufacturer: _____ Year installed: _____
What do you call this control equipment: _____
Pollutant(s) controlled: ☐ PE ☐ OC ☐ SO_2 ☐ NOx ☐ CO ☐ Other _____

Estimated capture efficiency (%):_____ Basis for efficiency: _____
Design control efficiency (%):_____ Basis for efficiency: _____
Type: ☐ Plate-wire ☐ Flat-plate ☐ Tubular ☐ Wet ☐ Other _____
Number of operating fields: _____

☐ This is the only control equipment on this air contaminant source
If no, this control equipment is: ☐ Primary ☐ Secondary ☐ Parallel
List any other air contaminant sources that are also vented to this control equipment:
_____

☐ **Concentrator**
Manufacturer: _____ Year installed: _____
What do you call this control equipment: _____
Pollutant(s) controlled: ☐ PE ☐ OC ☐ SO_2 ☐ NOx ☐ CO ☐ Other _____
Estimated capture efficiency (%):_____ Basis for efficiency: _____
Design regeneration cycle time (minutes): _____
Minimum desorption air stream temperature (^oF): _____
Rotational rate (revolutions/hour): _____
☐ This is the only control equipment on this air contaminant source
If no, this control equipment is: ☐ Primary ☐ Secondary ☐ Parallel
List any other air contaminant sources that are also vented to this control equipment:
_____

☐ **Catalytic Incinerator**
Manufacturer: _____ Year installed: _____
What do you call this control equipment: _____
Pollutant(s) controlled: ☐ PE ☐ OC ☐ SO_2 ☐ NOx ☐ CO ☐ Other _____
Estimated capture efficiency (%):_____ Basis for efficiency: _____
Design control efficiency (%):_____ Basis for efficiency: _____
Minimum inlet gas temperature (^oF): _____
Combustion chamber residence time (seconds): _____
Minimum temperature difference (^oF) across catalyst during air contaminant source operation: _____
☐ This is the only control equipment on this air contaminant source
If no, this control equipment is: ☐ Primary ☐ Secondary ☐ Parallel
List any other air contaminant sources that are also vented to this control equipment:
_____

☐ **Thermal Incinerator/Thermal Oxidizer**
Manufacturer: _____ Year installed: _____
What do you call this control equipment: _____
Pollutant(s) controlled: ☐ PE ☐ OC ☐ SO_2 ☐ NOx ☐ CO ☐ Other _____
Estimated capture efficiency (%):_____ Basis for efficiency: _____
Design control efficiency (%):_____ Basis for efficiency: _____
Minimum operating temperature (^oF) and location: _____ (See line by line instructions.)
Combustion chamber residence time (seconds): _____
☐ This is the only control equipment on this air contaminant source
If no, this control equipment is: ☐ Primary ☐ Secondary ☐ Parallel
List any other air contaminant sources that are also vented to this control equipment:
_____

☐ **Flare**
Manufacturer: _____ Year installed: _____
What do you call this control equipment: _____
Pollutant(s) controlled: ☐ PE ☐ OC ☐ SO_2 ☐ NOx ☐ CO ☐ Other _____
Estimated capture efficiency (%):_____ Basis for efficiency: _____
Design control efficiency (%):_____ Basis for efficiency: _____
Type: ☐ Enclosed ☐ Elevated (open)
Ignition device: ☐ Electric arc ☐ Pilot flame
Flame presence sensor: ☐ Yes ☐ No
☐ This is the only control equipment on this air contaminant source

If no, this control equipment is: ☐ Primary ☐ Secondary ☐ Parallel
List any other air contaminant sources that are also vented to this control equipment:
_____

☐ **Condenser**
Manufacturer: _____ Year installed: _____
What do you call this control equipment: _____
Pollutant(s) controlled: ☐ PE ☐ OC ☐ SO_2 ☐ NOx ☐ CO ☐ Other _____
Estimated capture efficiency (%):_____ Basis for efficiency: _____
Design control efficiency (%):_____ Basis for efficiency: _____

Type: ☐ Indirect contact ☐ Direct contact
Maximum exhaust gas temperature (^{o}F) during air contaminant source operation: _____
Coolant type: _____
Design coolant temperature (^{o}F): Minimum _____ Maximum _____
Design coolant flow rate (gpm): _____
☐ This is the only control equipment on this air contaminant source
If no, this control equipment is: ☐ Primary ☐ Secondary ☐ Parallel
List any other air contaminant sources that are also vented to this control equipment:
_____

☐ **Carbon Absorber**
Manufacturer: _____ Year installed: _____
What do you call this control equipment: _____
Pollutant(s) controlled: ☐ PE ☐ OC ☐ SO_2 ☐ NOx ☐ CO ☐ Other _____
Estimated capture efficiency (%):_____ Basis for efficiency: _____
Design control efficiency (%):_____ Basis for efficiency: _____
Type: ☐ On-site regenerative ☐ Disposable
Maximum design outlet organic compound concentration (ppmv): _____
Carbon replacement frequency or regeneration cycle time (specify units): _____
Maximum temperature of the carbon bed, after regeneration (including any cooling cycle): _____
☐ This is the only control equipment on this air contaminant source
If no, this control equipment is: ☐ Primary ☐ Secondary ☐ Parallel
List any other air contaminant sources that are also vented to this control equipment:
_____

☐ **Dry Scrubber**
Manufacturer: _____ Year installed: _____
What do you call this control equipment: _____
Pollutant(s) controlled: ☐ PE ☐ OC ☐ SO_2 ☐ NOx ☐ CO ☐ Other _____
Estimated capture efficiency (%):_____ Basis for efficiency: _____
Design control efficiency (%):_____ Basis for efficiency: _____
Reagent(s) used: Type: _____ Injection rate(s): _____
Operating pressure drop range (inches of water): Minimum: _____ Maximum: _____
☐ This is the only control equipment on this air contaminant source
If no, this control equipment is: ☐ Primary ☐ Secondary ☐ Parallel
List any other air contaminant sources that are also vented to this control equipment:
_____

☐ **Paint booth filter**
Type: ☐ Paper ☐ Fiberglass ☐ Water curtain ☐ Other _____
Design control efficiency (%):_____ Basis for efficiency: _____

☒ **Other**, describe Watering/wet material
Manufacturer: _____ Year installed: _____
What do you call this control equipment: _____
Pollutant(s) controlled: ☒ PE ☐ OC ☐ SO_2 ☐ NOx ☐ CO ☐ Other _____
Estimated capture efficiency (%): Refer to EAC Basis for efficiency: AP-40, AP-42, Ohio RACM
Design control efficiency (%):_____ Basis for efficiency: _____
☒ This is the only control equipment on this air contaminant source

If no, this control equipment is: ☐ Primary ☐ Secondary ☐ Parallel
List any other air contaminant sources that are also vented to this control equipment:
_____

6. Attach a Process or Activity Flow Diagram to this application for each air contaminant source included in the application. The diagram should indicate their relationships to one another. See the line by line PTI instructions for additional information.
See Permit Application Text

7. Emissions egress point(s) information: PTIs which allow total emissions in excess of the thresholds listed below will be subject to an air quality modeling analysis. This analysis is to assure that the impact from the requested project will not exceed Ohio=s Acceptable Incremental Impacts for criteria pollutants and/or Maximum Allowable Ground Level Concentrations (MAGLC) for air toxics. Permit requests that would have unacceptable impacts can not be approved as proposed. See the line by line PTI instructions for additional information.

   Complete the tables below if the requested allowable annual emission rate for this PTI exceeds any of the following:

   - Particulate Matter (PM10): 10 tons per year
   - Sulfur Dioxide (SO2): 25 tons per year
   - Nitrogen Oxides (NOx): 25 tons per year
   - Carbon Monoxide (CO): 100 tons per year
   - Air Toxic: 1 ton per year. An air toxic is any air pollutant for which the American Council of Governmental Industrial Hygienists (ACGIH) has established a Threshold Limit Value (TLV).

   Complete Table 7-A below for each stack emissions egress point. An egress point is a point at which emissions from an air contaminant source are released into the ambient (outside) air. List each individual egress point on a separate line.

Table 7-A, Stack Egress Point Information

Company Name or ID for the Egress Point (examples: Stack A; Boiler Stack; etc.)	Type Code*	Stack Egress Point Shape and Dimensions (in)(examples: round 10 inch ID; rectangular 14 X 16 inches; etc.)	Stack Egress Point Height from the Ground (ft)	Stack Temp. at Max. Capacity (F)	Stack Flow Rate at Max. Capacity (ACFM)	Minimum Distance to the Property Line (ft)

*Type codes for stack egress points:

A. vertical stack (unobstructed): There are no obstructions to upward flow in or on the stack such as a rain cap.
B. vertical stack (obstructed): There are obstructions to the upward flow, such as a rain cap, which prevents

or inhibits the air flow in a vertical direction.

C. non-vertical stack: The stack directs the air flow in a direction which is not directly upward.

Complete Table 7-B below for each fugitive emissions egress point. List each individual egress point on a separate line. Refer to the description of the fugitive egress point type codes below the table for use in completing the type code column of the table. For air contaminant sources like roadways and storage piles, only the first 5 columns need to be completed. For an air contaminant source with multiple fugitive emissions egress points, include only the primary egress points.

Table 7-B, Fugitive Egress Point Information

Company ID for the Egress Point (examples; Garage Door B, Building C; Roof Monitor; etc.)	Type Code*	Egress Point Description (examples: garage door, 12 X 30 feet, west wall; outside gravel storage piles; etc.)	Fugitive Egress Point Height from the Ground (ft)	Minimum Distance to the Property Line (ft)	Exit Gas Temp. (F)
Emergency Coke Storage Pile	F	1.5 ac. coke storage pile			
Coal Storage Pile #1	F	1.2 ac. coal storage pile			
Coal Storage Pile #2	F	1.3 ac. coal storage pile			
Emergency Coke Breeze Pile	F	0.2 ac. coke breeze storage pile			
Emergency Screened Coke Pile	F	0.3 ac. screened coke storage pile			

*Type codes for fugitive egress point:

D. door or window
E. other opening in the building without a duct
F. no stack and no building enclosing the air contaminant source (e.g., roadways)

Complete Table 7-C below for each Stack Egress Point identified in Table 7-A above. In each case, use the dimensions of the largest nearby building, building segment or structure. List each individual egress point on a separate line. Use the same Company Name or ID for the Egress Point in Table 7-C that was used in Table 7-A. See the line by line PTI instructions for additional information.

Table 7-C, Egress Point Additional Information (Add rows as necessary)

Company ID or Name for the Egress Point	Building Height (ft)	Building Width (ft)	Building Length (ft)

8. Request for Federally Enforceable Limits

As part of this permit application, do you wish to propose voluntary restrictions to limit emissions in order to avoid specific requirements listed below, (i.e., are you requesting federally enforceable limits to obtain synthetic minor status)?

☐ yes
☒ no
☐ not sure - please contact me if this affects me

If yes, why are you requesting federally enforceable limits? Check all that apply.

a. ☐ to avoid being a major source (see OAC rule 3745-77-01)
b. ☐ to avoid being a major MACT source (see OAC rule 3745-31-01)
c. ☐ to avoid being a major modification (see OAC rule 3745-31-01)
d. ☐ to avoid being a major stationary source (see OAC rule 3745-31-01)
e. ☐ to avoid an air dispersion modeling requirement (see Engineering Guide # 69)
f. ☐ to avoid another requirement. Describe: _____

If you checked a., b. or d., please attach a facility-wide potential to emit (PTE) analysis (for each pollutant) and synthetic minor strategy to this application. (See line by line instructions for definition of PTE.) If you checked c., please attach a net emission change analysis to this application.

9. If this air contaminant source utilizes any continuous emissions monitoring equipment for indicating or demonstrating compliance, complete the following table. This does not include continuous parametric monitoring systems.

Company ID for Egress Point	**Type of Monitor**	**Applicable performance specification (40 CFR 60, Appendix B)**	**Pollutant(s) Monitored**

10. Do you wish to permit this air contaminant source as a portable source, allowing relocation within the state in accordance with OAC rule 3745-31-03 or OAC rule 3745-31-05?

☐ yes - Note: notification requirements in rules cited above must be followed.
☒ no

11. The appropriate Emissions Activity Category (EAC) form(s) must be completed and attached for each air contaminant source. At least one complete EAC form must be submitted for each air contaminant source for the application to be considered complete. Refer to the list attached to the PTI instructions.

FOR OHIO EPA USE
FACILITY ID: _____
EU ID: _____ PTI#: _____

EMISSIONS ACTIVITY CATEGORY FORM
STORAGE PILES

This form is to be completed for each storage pile. State/Federal regulations which may apply to storage piles are listed in the instructions. Note that there may be other regulations which apply to this emissions unit which are not included in this list.

1. Reason this form is being submitted (Check one)

   ☒ New Permit ☐ Renewal or Modification of Air Permit Number(s) (e.g. F001) F002

2. Maximum Operating Schedule: 24 hours per day; 365 days per year

   If the schedule is less than 24 hours/day or 365 days/year, what limits the schedule to less than maximum? See instructions for examples. _____

3. Meteorological data at or near storage pile area:

   a. mean number of days per year in which >0.01 inch of precipitation occurred 130 days
   b. percentage of time wind speed exceeds 12 miles per hour: 29 %
   c. mean wind speed: 9.9 miles per hour
   d. source of meteorological data: (a) AP-42, Figure 13.2.2-1
      (b) Dayton International Airport 1984 - 1992 wind rose
      (c) Tanks 4.09 Meteorological Data (Dayton, OH)

4. Description of storage pile activities:

ID	Type of Material Stored	Method of Load-in (check one or more)	Method of Load-out (check one or more)
A	Open Emergency Coke Pile	☒ conveyor/stacker: ☐ front-end loader ☐ other (describe): _____	☐ bucket wheel reclaimer ☐ under pile feed ☐ rake reclaimer ☐ pan scraper ☒ front-end loader ☐ other: _____
B	Open Coal Pile #1 (Dead Pile)	☒ conveyor/stacker: ☐ front-end loader ☐ other (describe): _____	☐ bucket wheel reclaimer ☐ under pile feed ☐ rake reclaimer ☐ pan scraper ☒ front-end loader ☐ other: _____
C	Open Coal Pile #2 (Live Pile)	☒ conveyor/stacker: ☐ front-end loader ☐ other (describe): _____	☐ bucket wheel reclaimer ☒ under pile feed ☐ rake reclaimer ☐ pan scraper ☐ front-end loader ☐ other: _____
D	Open Emergency Coke Breeze Pile	☒ conveyor/stacker: ☐ front-end loader ☐ other (describe): _____	☐ bucket wheel reclaimer ☐ under pile feed ☐ rake reclaimer ☐ pan scraper ☒ front-end loader ☐ other: _____
E	Open Emergency Screened Coke Pile	☒ conveyor/stacker: ☐ front-end loader ☐ other (describe): _____	☐ bucket wheel reclaimer ☐ under pile feed ☐ rake reclaimer ☐ pan scraper ☒ front-end loader ☐ other: _____

5. STORAGE PILE ACTIVITIES:

ID	Number of Separate Piles	Average Silt Content (wt %)	Average Moisture Content (wt %)	Average Pile Surface Area (acres)	Max. Load-in Rate (tons/hr)	Max. Load-in Rate (tons/yr)	Max. Load-out Rate (tons/hr)	Max. Load-out Rate (tons/yr)
A	1	1.0	7.0	1.50	500[a]	654,449	500[a]	654,449
B	1	4.6	8.0	1.20	600[b]	456,250	600[b]	456,250
C	1	4.6	8.0	1.30	600[b]	456,250	600[b]	456,250
D	1	4.9	7.0	0.2	500[c]	40,621	500[c]	40,621
E	1	1.0	7.0	0.3	500[d]	613,828	500[d]	613,828

[a] Emissions based on 1,793 tons coke/day
[b] Emissions based on 2,500 tons coal/day
[c] Emissions based on 111 tons breeze/day
[d] Emissions based on 1,682 tons screened coke/day

6. WIND EROSION CONTROL METHODS

ID	Enclosure, Covering, and/or Operating Practices (describe)	Chemical Stabilization (check one or more)	Application Frequency	Overall Control Eff. (%)	Basis for Overall Wind Erosion Control Efficiency
A	Wet Material	☐ water ☐ crusting agents ☐ other:_____		0%	
B	Water Sprays	☒ water ☐ crusting agents ☐ other:_____	As needed	50%	Ohio RACM
C	Water Sprays	☒ water ☐ crusting agents ☐ other:_____	As needed	50%	Ohio RACM
D	Wet Material	☐ water ☐ crusting agents ☐ other:_____		0%	
E	Wet Material	☐ water ☐ crusting agents ☐ other:_____		0%	

7. LOAD-IN CONTROL METHODS

ID	Enclosure and/or Operating Practices (describe)	Chemical Stabilization	Application Frequency	Overall Control Eff. (%)	Basis for Overall Load-in Control Efficiency
A	Wet Material	☐ water ☐ dust suppressant ☐ other: _____		0%	
B	Wet Material	☐ water ☐ dust suppressant ☐ other: _____		0%	
C	Wet Material	☐ water ☐ dust suppressant ☐ other: _____		0%	
D	Wet Material	☐ water ☐ dust suppressant ☐ other: _____		0%	
E	Wet Material	☐ water ☐ dust suppressant ☐ other: _____		0%	

8. LOAD-OUT CONTROL METHODS

ID	Enclosure and/or Operating Practices (describe)	Chemical Stabilization	Application Frequency	Overall Control Eff. (%)	Basis for Overall Load-out Control Efficiency
A	Wet Material	☐ water ☐ dust suppressant ☐ other: _____		0%	
B	Wet Material	☐ water ☐ dust suppressant ☐ other: _____		0%	
C	Wet Material	☐ water ☐ dust suppressant ☒ other: enclosure		95%	Ohio RACM
D	Wet Material	☐ water ☐ dust suppressant ☐ other: _____		0%	
E	Wet Material	☐ water ☐ dust suppressant ☐ other: _____		0%	

Section II - Specific Air Contaminant Source Information **REVISED APRIL 2008**

NOTE: One copy of this section should be filled out for each air contaminant source covered by this PTI application. See the line by line PTI instructions for additional information.

1. Company identification (name for air contaminant source for which you are applying): Coal Handling, Processing and Transfer (F003)

2. List all equipment that are part of this air contaminant source: Coal Handling, Transfer System and coal screening

3. Air Contaminant Source Installation or Modification Schedule (must be completed regardless of date of installation or modification):

   When did/will you begin to install or modify the air contaminant source? (month/year) June 2008

   When did/will you begin to operate the air contaminant source? (month/year) December 2009 **OR** after issuance of PTI

   _____

4. Emissions Information: The following table requests information needed to determine the applicable requirements and the compliance status of this air contaminant source with those requirements. Suggestions for how to estimate emissions may be found in the instructions to the Emissions Activity Category (EAC) forms required with this application. If you need further assistance, contact your Ohio EPA permit representative.

   - If total potential emissions of HAPs or any Air Toxic is greater than 1 ton/yr, fill in the table for that (those) pollutant(s). For all other pollutants, if "Emissions before controls (max), lb/hr" multiplied by 24 hours/day is greater than 10 lb/day, fill in the table for that pollutant.
   - If you have no add-on control equipment, "Emissions before controls= will be the same as "Actual emissions"
   - Annual emissions should be based on operating 8760 hr/yr unless you are requesting operating restrictions to limit emissions in line # 8 or have described inherent limitations below.
   - If you use units other than lb/hr or ton/yr, specify the units used (e.g., gr/dscf, lb/ton charged, lb/MMBtu, ton/12-months).
   - Requested Allowable (ton/yr) is often equivalent to Potential to Emit (PTE) as defined in OAC rule 3745-31-01 and OAC rule 3745-77-01.

Pollutant	Emissions before controls (max) (lb/hr)	Actual emissions (lb/hr)	Actual emissions (ton/year)	Requested Allowable (lb/hr)	Requested Allowable (ton/year)
Particulate emissions (PE) (formerly particulate matter, PM)			5.93		5.93
PM_{10} (PM < 10 microns in diameter)			2.83		2.83
Sulfur dioxide (SO_2)					
Nitrogen oxides (NO_x)					
Carbon monoxide (CO)					
Organic compounds (OC)					
Volatile organic compounds (VOC)					
Total HAPs					
Highest single HAP:					
Air Toxics (see instructions):					

Based on 2500 tons coal/day

Provide your calculations as an attachment and explain how all process variables and emission factors were selected. Note the emissions factor(s) employed and document the origin. Example: AP-42, Table 4.4-3 (8/97); stack test, Method 5, 4/96; mass balance based on MSDS; etc.

5. **Does this air contaminant source employ emissions control equipment?**

☒ **Yes** - fill out the applicable information below.

☐ **No** - proceed to item # 6.

Note: Pollutant abbreviations used below: Particulates = PE; Organic compounds = OC; Sulfur dioxide = SO_2; Nitrogen oxides = NOx; Carbon monoxide = CO

☐ **Cyclone/Multiclone**

Manufacturer: _____ Year installed: _____
What do you call this control equipment: _____
Pollutant(s) controlled: ☐ PE ☐ OC ☐ SO_2 ☐ NOx ☐ CO ☐ Other _____
Estimated capture efficiency (%): _____ Basis for efficiency: _____
Design control efficiency (%):_____ Basis for efficiency: _____
Type: ☐ Cyclone ☐ Multiclone ☐ Rotoclone ☐ Other _____
☐ This is the only control equipment on this air contaminant source
If no, this control equipment is: ☐ Primary ☐ Secondary ☐ Parallel
List any other air contaminant sources that are also vented to this control equipment:
_____

☐ **Fabric Filter/Baghouse**

Manufacturer: _____ Year installed: _____
What do you call this control equipment: _____
Pollutant(s) controlled: ☐ PE ☐ OC ☐ SO_2 ☐ NOx ☐ CO ☐ Other _____
Estimated capture efficiency (%):_____Basis for efficiency_____
Design control efficiency (%):_____Basis for efficiency: _____
Operating pressure drop range (inches of water): Minimum_____Maximum_____
Pressure type: ☐ Negative pressure ☐ Positive pressure
Fabric cleaning mechanism: ☐ Reverse air ☐ Pulse jet ☐ Shaker ☐ Other _____
☐ Lime injection or fabric coating agent used: Type: _____ Feed rate: _____
☐ This is the only control equipment on this air contaminant source
If no, this control equipment is: ☐ Primary ☐ Secondary ☐ Parallel
List any other air contaminant sources that are also vented to this control equipment:
_____

☐ **Wet Scrubber**

Manufacturer: _____ Year installed: _____
What do you call this control equipment: _____
Pollutant(s) controlled: ☐ PE ☐ OC ☐ SO_2 ☐ NOx ☐ CO ☐ Other _____
Estimated capture efficiency (%):_____ Basis for efficiency: _____
Design control efficiency (%):_____ Basis for efficiency: _____
Type: ☐ Spray chamber ☐ Packed bed ☐ Impingement ☐ Venturi ☐ Other _____
Operating pressure drop range (inches of water): Minimum: _____ Maximum: _____
pH range for scrubbing liquid: Minimum: _____ Maximum: _____
Scrubbing liquid flow rate (gal/min): _____
Is scrubber liquid recirculated? ☐ Yes ☐ No
Water supply pressure (psig): _____ NOTE: This item for spray chambers only.
☐ This is the only control equipment on this air contaminant source
If no, this control equipment is: ☐ Primary ☐ Secondary ☐ Parallel
List any other air contaminant sources that are also vented to this control equipment:
_____

☐ **Electrostatic Precipitator**

Manufacturer: _____ Year installed: _____
What do you call this control equipment: _____

Pollutant(s) controlled: ☐ PE ☐ OC ☐ SO_2 ☐ NOx ☐ CO ☐ Other _____
Estimated capture efficiency (%):_____ Basis for efficiency: _____
Design control efficiency (%):_____ Basis for efficiency: _____
Type: ☐ Plate-wire ☐ Flat-plate ☐ Tubular ☐ Wet ☐ Other _____
Number of operating fields: _____

☐ This is the only control equipment on this air contaminant source
If no, this control equipment is: ☐ Primary ☐ Secondary ☐ Parallel
List any other air contaminant sources that are also vented to this control equipment:
_____

☐ **Concentrator**
Manufacturer: _____ Year installed: _____
What do you call this control equipment: _____
Pollutant(s) controlled: ☐ PE ☐ OC ☐ SO_2 ☐ NOx ☐ CO ☐ Other _____
Estimated capture efficiency (%):_____ Basis for efficiency: _____
Design regeneration cycle time (minutes): _____
Minimum desorption air stream temperature (^oF): _____
Rotational rate (revolutions/hour): _____
☐ This is the only control equipment on this air contaminant source
If no, this control equipment is: ☐ Primary ☐ Secondary ☐ Parallel
List any other air contaminant sources that are also vented to this control equipment:
_____

☐ **Catalytic Incinerator**
Manufacturer: _____ Year installed: _____
What do you call this control equipment: _____
Pollutant(s) controlled: ☐ PE ☐ OC ☐ SO_2 ☐ NOx ☐ CO ☐ Other _____
Estimated capture efficiency (%):_____ Basis for efficiency: _____
Design control efficiency (%):_____ Basis for efficiency: _____
Minimum inlet gas temperature (^oF): _____
Combustion chamber residence time (seconds): _____
Minimum temperature difference (^oF) across catalyst during air contaminant source operation: _____
☐ This is the only control equipment on this air contaminant source
If no, this control equipment is: ☐ Primary ☐ Secondary ☐ Parallel
List any other air contaminant sources that are also vented to this control equipment:
_____

☐ **Thermal Incinerator/Thermal Oxidizer**
Manufacturer: _____ Year installed: _____
What do you call this control equipment: _____
Pollutant(s) controlled: ☐ PE ☐ OC ☐ SO_2 ☐ NOx ☐ CO ☐ Other _____
Estimated capture efficiency (%):_____ Basis for efficiency: _____
Design control efficiency (%):_____ Basis for efficiency: _____
Minimum operating temperature (^oF) and location: _____ (See line by line instructions.)
Combustion chamber residence time (seconds): _____
☐ This is the only control equipment on this air contaminant source
If no, this control equipment is: ☐ Primary ☐ Secondary ☐ Parallel
List any other air contaminant sources that are also vented to this control equipment:
_____

☐ **Flare**
Manufacturer: _____ Year installed: _____
What do you call this control equipment: _____
Pollutant(s) controlled: ☐ PE ☐ OC ☐ SO_2 ☐ NOx ☐ CO ☐ Other _____
Estimated capture efficiency (%):_____ Basis for efficiency: _____
Design control efficiency (%):_____ Basis for efficiency: _____
Type: ☐ Enclosed ☐ Elevated (open)
Ignition device: ☐ Electric arc ☐ Pilot flame
Flame presence sensor: ☐ Yes ☐ No

☐ This is the only control equipment on this air contaminant source
If no, this control equipment is: ☐ Primary ☐ Secondary ☐ Parallel
List any other air contaminant sources that are also vented to this control equipment:
_____

☐ **Condenser**
Manufacturer: _____ Year installed: _____
What do you call this control equipment: _____
Pollutant(s) controlled: ☐ PE ☐ OC ☐ SO_2 ☐ NOx ☐ CO ☐ Other _____
Estimated capture efficiency (%):_____ Basis for efficiency: _____
Design control efficiency (%):_____ Basis for efficiency: _____
Type: ☐ Indirect contact ☐ Direct contact
Maximum exhaust gas temperature (^oF) during air contaminant source operation: _____
Coolant type: _____
Design coolant temperature (^oF): Minimum _____ Maximum _____
Design coolant flow rate (gpm): _____
☐ This is the only control equipment on this air contaminant source
If no, this control equipment is: ☐ Primary ☐ Secondary ☐ Parallel
List any other air contaminant sources that are also vented to this control equipment:
_____

☐ **Carbon Absorber**
Manufacturer: _____ Year installed: _____
What do you call this control equipment: _____
Pollutant(s) controlled: ☐ PE ☐ OC ☐ SO_2 ☐ NOx ☐ CO ☐ Other _____
Estimated capture efficiency (%):_____ Basis for efficiency: _____
Design control efficiency (%):_____ Basis for efficiency: _____
Type: ☐ On-site regenerative ☐ Disposable
Maximum design outlet organic compound concentration (ppmv): _____
Carbon replacement frequency or regeneration cycle time (specify units): _____
Maximum temperature of the carbon bed, after regeneration (including any cooling cycle): _____
☐ This is the only control equipment on this air contaminant source
If no, this control equipment is: ☐ Primary ☐ Secondary ☐ Parallel
List any other air contaminant sources that are also vented to this control equipment:
_____

☐ **Dry Scrubber**
Manufacturer: _____ Year installed: _____
What do you call this control equipment: _____
Pollutant(s) controlled: ☐ PE ☐ OC ☐ SO_2 ☐ NOx ☐ CO ☐ Other _____
Estimated capture efficiency (%):_____ Basis for efficiency: _____
Design control efficiency (%):_____ Basis for efficiency: _____
Reagent(s) used: Type: _____ Injection rate(s): _____
Operating pressure drop range (inches of water): Minimum: _____ Maximum: _____
☐ This is the only control equipment on this air contaminant source
If no, this control equipment is: ☐ Primary ☐ Secondary ☐ Parallel
List any other air contaminant sources that are also vented to this control equipment:
_____

☐ **Paint booth filter**
Type: ☐ Paper ☐ Fiberglass ☐ Water curtain ☐ Other _____
Design control efficiency (%):_____ Basis for efficiency: _____

☒ **Other**, describe Enclosure, wet material
Manufacturer: _____ Year installed: _____
What do you call this control equipment: Wet Suppression + Enclosure, Wet Suppression + Partial Enclosure
Pollutant(s) controlled: ☒ PE ☐ OC ☐ SO_2 ☐ NOx ☐ CO ☐ Other _____
Estimated capture efficiency (%): NA Basis for efficiency:_____
Design control efficiency (%):
70% (Coal Unloading - Wet Suppression + Partial Enclosure) Basis for efficiency: Ohio RACM

95% (Coal Transfer - Wet Suppression + Total Enclosure) Basis for efficiency: Ohio RACM
☒ This is the only control equipment on this air contaminant source
If no, this control equipment is: ☐ Primary ☐ Secondary ☐ Parallel
List any other air contaminant sources that are also vented to this control equipment:
_____

6. Attach a Process or Activity Flow Diagram to this application for each air contaminant source included in the application. The diagram should indicate their relationships to one another. See the line by line PTI instructions for additional information.
See Permit Application Text

7. Emissions egress point(s) information: PTIs which allow total emissions in excess of the thresholds listed below will be subject to an air quality modeling analysis. This analysis is to assure that the impact from the requested project will not exceed Ohio=s Acceptable Incremental Impacts for criteria pollutants and/or Maximum Allowable Ground Level Concentrations (MAGLC) for air toxics. Permit requests that would have unacceptable impacts can not be approved as proposed. See the line by line PTI instructions for additional information.

   Complete the tables below if the requested allowable annual emission rate for this PTI exceeds any of the following:

   - Particulate Matter (PM10): 10 tons per year
   - Sulfur Dioxide (SO2): 25 tons per year
   - Nitrogen Oxides (NOx): 25 tons per year
   - Carbon Monoxide (CO): 100 tons per year
   - Air Toxic: 1 ton per year. An air toxic is any air pollutant for which the American Council of Governmental Industrial Hygienists (ACGIH) has established a Threshold Limit Value (TLV).

   Complete Table 7-A below for each stack emissions egress point. An egress point is a point at which emissions from an air contaminant source are released into the ambient (outside) air. List each individual egress point on a separate line.

Table 7-A, Stack Egress Point Information

Company Name or ID for the Egress Point (examples: Stack A; Boiler Stack; etc.)	Type Code*	Stack Egress Point Shape and Dimensions (in)(examples: round 10 inch ID; rectangular 14 X 16 inches; etc.)	Stack Egress Point Height from the Ground (ft)	Stack Temp. at Max. Capacity (F)	Stack Flow Rate at Max. Capacity (ACFM)	Minimum Distance to the Property Line (ft)

*Type codes for stack egress points:

A. vertical stack (unobstructed): There are no obstructions to upward flow in or on the stack such as a rain

cap.

B. vertical stack (obstructed): There are obstructions to the upward flow, such as a rain cap, which prevents or inhibits the air flow in a vertical direction.

C. non-vertical stack: The stack directs the air flow in a direction which is not directly upward.

Complete Table 7-B below for each fugitive emissions egress point. List each individual egress point on a separate line. Refer to the description of the fugitive egress point type codes below the table for use in completing the type code column of the table. For air contaminant sources like roadways and storage piles, only the first 5 columns need to be completed. For an air contaminant source with multiple fugitive emissions egress points, include only the primary egress points.

Table 7-B, Fugitive Egress Point Information

Company ID for the Egress Point (examples; Garage Door B, Building C; Roof Monitor; etc.)	Type Code*	Egress Point Description (examples: garage door, 12 X 30 feet, west wall; outside gravel storage piles; etc.)	Fugitive Egress Point Height from the Ground (ft)	Minimum Distance to the Property Line (ft)	Exit Gas Temp. (F)
Coal Unloading	F				
Coal Crushing	F				
Coal Transfer	F				

*Type codes for fugitive egress point:

D. door or window

E. other opening in the building without a duct

F. no stack and no building enclosing the air contaminant source (e.g., roadways)

Complete Table 7-C below for each Stack Egress Point identified in Table 7-A above. In each case, use the dimensions of the largest nearby building, building segment or structure. List each individual egress point on a separate line. Use the same Company Name or ID for the Egress Point in Table 7-C that was used in Table 7-A. See the line by line PTI instructions for additional information.

Table 7-C, Egress Point Additional Information (Add rows as necessary)

Company ID or Name for the Egress Point	Building Height (ft)	Building Width (ft)	Building Length (ft)

8. Request for Federally Enforceable Limits

As part of this permit application, do you wish to propose voluntary restrictions to limit emissions in order to avoid specific requirements listed below, (i.e., are you requesting federally enforceable limits to obtain synthetic minor status)?

☐ yes
☒ no
☐ not sure - please contact me if this affects me

If yes, why are you requesting federally enforceable limits? Check all that apply.

a. ☐ to avoid being a major source (see OAC rule 3745-77-01)
b. ☐ to avoid being a major MACT source (see OAC rule 3745-31-01)
c. ☐ to avoid being a major modification (see OAC rule 3745-31-01)
d. ☐ to avoid being a major stationary source (see OAC rule 3745-31-01)
e. ☐ to avoid an air dispersion modeling requirement (see Engineering Guide # 69)
f. ☐ to avoid another requirement. Describe: _____

If you checked a., b. or d., please attach a facility-wide potential to emit (PTE) analysis (for each pollutant) and synthetic minor strategy to this application. (See line by line instructions for definition of PTE.) If you checked c., please attach a net emission change analysis to this application.

9. If this air contaminant source utilizes any continuous emissions monitoring equipment for indicating or demonstrating compliance, complete the following table. This does not include continuous parametric monitoring systems.

Company ID for Egress Point	**Type of Monitor**	**Applicable performance specification (40 CFR 60, Appendix B)**	**Pollutant(s) Monitored**

10. Do you wish to permit this air contaminant source as a portable source, allowing relocation within the state in accordance with OAC rule 3745-31-03 or OAC rule 3745-31-05?

☐ yes - Note: notification requirements in rules cited above must be followed.
☒ no

11. The appropriate Emissions Activity Category (EAC) form(s) must be completed and attached for each air contaminant source. At least one complete EAC form must be submitted for each air contaminant source for the application to be considered complete. Refer to the list attached to the PTI instructions.

FOR OHIO EPA USE
FACILITY ID:_____
EU ID:_____ PTI#:_____

EMISSIONS ACTIVITY CATEGORY FORM
MATERIAL HANDLING: FUGITIVE DUST EMISSIONS

This form is to be completed for any material handling operation with fugitive dust emissions. State/Federal regulations which may apply to material handling operations are listed in the instructions. Note that there may be other regulations which apply to this emissions unit which are not included in this list.

1. Reason this form is being submitted (Check one)

   ☒ New Permit ☐ Renewal or Modification of Air Permit Number(s) (e.g. F001) F003

2. Maximum Operating Schedule: 24 hours per day; 365 days per year

   If the schedule is less than 24 hours/day or 365 days/year, what limits the schedule to less than maximum? See instructions for examples. _____

3. What is the material being handled? Coal

4. Mean wind speed at or near facility 9.9 miles per hour

5. Complete the following table for all unloading operations.

ID	Type of Unloading (see examples below)	Material Unloaded	Annual Quantity Unloaded (tons/yr)	Hourly Maximum Unloading Rate (tons/hr)	Avg. Moisture Content, as Unloaded (%)
A	Truck: ☐ dump ☐ pneumatic Vessel: ☐ clamshell ☐ bucket ladder Rail car: ☐ side dump ☒ bottom dump ☐ rotary dump ☐ pneumatic Other: _____	Coal	912,500	600	8%
B	Truck: ☐ dump ☐ pneumatic Vessel: ☐ clamshell ☐ bucket ladder Rail car: ☐ side dump ☐ bottom dump ☐ rotary dump ☐ pneumatic Other: _____				
C	Truck: ☐ dump ☐ pneumatic Vessel: ☐ clamshell ☐ bucket ladder Rail car: ☐ side dump ☐ bottom dump ☐ rotary dump ☐ pneumatic Other: _____				

D	Truck: ☐ dump ☐ pneumatic Vessel: ☐ clamshell ☐ bucket ladder Rail car: ☐ side dump ☐ bottom dump ☐ rotary dump ☐ pneumatic Other: _____				

6. Complete the following table for all loading operations.

ID	Type of Loading (see examples below)	Material Loaded	Annual Quantity Loaded (tons/yr)	Hourly Maximum Loading Rate (tons/hr)	Avg. Moisture Content, as Loaded (%)
E	☐ front end loader ☐ under pile load out ☐ bucket well reclaimer ☐ rake reclaimer ☐ other: _____				
F	☐ front end loader ☐ under pile load out ☐ bucket well reclaimer ☐ rake reclaimer ☐ other: _____				
G	☐ front end loader ☐ under pile load out ☐ bucket well reclaimer ☐ rake reclaimer ☐ other: _____				
H	☐ front end loader ☐ under pile load out ☐ bucket well reclaimer ☐ rake reclaimer ☐ other: _____				

7. Complete the following table for all transfer operations.

ID	Type of Transfer Point (see examples below)	Number of Such Points	Type of Material Handled	Max. Transfer Rate (tons/hr)
I	☐ Load/unload conveyor: ☐ vibrating ☐ belt ☐ screw ☐ bucket elevator ☒ belt conveyor to belt conveyor Other:_____	9	Coal	600
J	☐ Load/unload conveyor: ☐ vibrating ☐ belt ☐ screw ☐ bucket elevator ☒ belt conveyor to belt conveyor Other:_____	6	Coal	600
K	☐ Load/unload conveyor: ☐ vibrating ☐ belt ☐ screw ☐ bucket elevator ☐ belt conveyor to belt conveyor Other: _____			
L	☐ Load/unload conveyor: ☐ vibrating ☐ belt ☐ screw ☐ bucket elevator ☐ belt conveyor to belt conveyor Other:_____			
M	☐ Load/unload conveyor: ☐ vibrating ☐ belt ☐ screw ☐ bucket elevator ☐ belt conveyor to belt conveyor Other:_____			
N	☐ Load/unload conveyor: ☐ vibrating ☐ belt ☐ screw ☐ bucket elevator ☐ belt conveyor to belt conveyor Other:_____			
O	☐ Load/unload conveyor: ☐ vibrating ☐ belt ☐ screw ☐ bucket elevator ☐ belt conveyor to belt conveyor Other:_____			

8. Summarize the material handling operations covered in items 5 through 7 above and identify the applicable control method(s) from available options. Complete the remaining table based upon the selected control method(s).

ID	Enclosure, Control Equipment (describe)	Chemical Stabilization	Application Frequency	Overall Control Eff. (%)	Basis for Overall Control Efficiency
A	Enclosure (Coal Unloading)	☒ water ☐ dust suppressant ☐ other: _____		70%	Ohio RACM
B		☐ water ☐ dust suppressant ☐ other: _____			
C		☐ water ☐ dust suppressant ☐ other: _____			
D		☐ water ☐ dust suppressant ☐ other: _____			
E		☐ water ☐ dust suppressant ☐ other: _____			
F		☐ water ☐ dust suppressant ☐ other: _____			
G		☐ water ☐ dust suppressant ☐ other: _____			
H		☐ water ☐ dust suppressant ☐ other: _____			
I	Enclosure (coal transfer)	☐ water ☐ dust suppressant ☒ other: wet material		95%	Ohio RACM
J	No enclosure (coal transfer)	☐ water ☐ dust suppressant ☒ other: wet material			

K		☐ water ☐ dust suppressant ☐ other: _____			
L		☐ water ☐ dust suppressant ☐ other: _____			
M		☐ water ☐ dust suppressant ☐ other: _____			
N		☐ water ☐ dust suppressant ☐ other: _____			
O		☐ water ☐ dust suppressant ☐ other: _____			

Section II - Specific Air Contaminant Source Information **REVISED APRIL 2008**

NOTE: One copy of this section should be filled out for each air contaminant source covered by this PTI application. See the line by line PTI instructions for additional information.

1. Company identification (name for air contaminant source for which you are applying): Coke and breeze handling and processing (F004)

2. List all equipment that are part of this air contaminant source: Conveying and coke transfer towers and coke screening

3. Air Contaminant Source Installation or Modification Schedule (must be completed regardless of date of installation or modification):

   When did/will you begin to install or modify the air contaminant source? (month/year) June 2008

   When did/will you begin to operate the air contaminant source? (month/year) December 2009 **OR** after issuance of PTI

   _____

4. Emissions Information: The following table requests information needed to determine the applicable requirements and the compliance status of this air contaminant source with those requirements. Suggestions for how to estimate emissions may be found in the instructions to the Emissions Activity Category (EAC) forms required with this application. If you need further assistance, contact your Ohio EPA permit representative.

   - If total potential emissions of HAPs or any Air Toxic is greater than 1 ton/yr, fill in the table for that (those) pollutant(s). For all other pollutants, if "Emissions before controls (max), lb/hr" multiplied by 24 hours/day is greater than 10 lb/day, fill in the table for that pollutant.
   - If you have no add-on control equipment, "Emissions before controls= will be the same as "Actual emissions"
   - Annual emissions should be based on operating 8760 hr/yr unless you are requesting operating restrictions to limit emissions in line # 8 or have described inherent limitations below.
   - If you use units other than lb/hr or ton/yr, specify the units used (e.g., gr/dscf, lb/ton charged, lb/MMBtu, ton/12-months).
   - Requested Allowable (ton/yr) is often equivalent to Potential to Emit (PTE) as defined in OAC rule 3745-31-01 and OAC rule 3745-77-01.

Pollutant	Emissions before controls (max) (lb/hr)	Actual emissions (lb/hr)	Actual emissions (ton/year)	Requested Allowable (lb/hr)	Requested Allowable (ton/year)
Particulate emissions (PE) (formerly particulate matter, PM)			20.04		20.04
PM_{10} (PM < 10 microns in diameter)			17.39		17.39
Sulfur dioxide (SO_2)					
Nitrogen oxides (NO_x)					
Carbon monoxide (CO)					
Organic compounds (OC)					
Volatile organic compounds (VOC)					
Total HAPs					
Highest single HAP:					
Air Toxics (see instructions):					

Provide your calculations as an attachment and explain how all process variables and emission factors were selected. Note the emissions factor(s) employed and document the origin. Example: AP-42, Table 4.4-3 (8/97); stack test, Method 5, 4/96; mass balance based on MSDS; etc.

5. **Does this air contaminant source employ emissions control equipment?**

☒ **Yes** - fill out the applicable information below.

☐ **No** - proceed to item # 6.

Note: Pollutant abbreviations used below: Particulates = PE; Organic compounds = OC; Sulfur dioxide = SO_2; Nitrogen oxides = NOx; Carbon monoxide = CO

☐ **Cyclone/Multiclone**

Manufacturer: _____ Year installed: _____
What do you call this control equipment: _____
Pollutant(s) controlled: ☐ PE ☐ OC ☐ SO_2 ☐ NOx ☐ CO ☐ Other _____
Estimated capture efficiency (%): _____ Basis for efficiency: _____
Design control efficiency (%):_____ Basis for efficiency: _____
Type: ☐ Cyclone ☐ Multiclone ☐ Rotoclone ☐ Other _____
☐ This is the only control equipment on this air contaminant source
If no, this control equipment is: ☐ Primary ☐ Secondary ☐ Parallel
List any other air contaminant sources that are also vented to this control equipment:
_____

☒ **Fabric Filter/Baghouse**

Manufacturer: _____ Year installed: _____
What do you call this control equipment: Baghouse (for coke screening)
Pollutant(s) controlled: ☒ PE ☐ OC ☐ SO_2 ☐ NOx ☐ CO ☐ Other _____
Estimated capture efficiency (%): 99% Basis for efficiency: Engineering Estimate
Design control efficiency (%): 99% Basis for efficiency: Engineering Estimate
Operating pressure drop range (inches of water): Minimum: 3 Maximum: 12
Pressure type: ☒ Negative pressure ☐ Positive pressure
Fabric cleaning mechanism: ☐ Reverse air ☒ Pulse jet ☐ Shaker ☐ Other _____
☐ Lime injection or fabric coating agent used: Type: _____ Feed rate: _____
☒ This is the only control equipment on this air contaminant source
If no, this control equipment is: ☐ Primary ☐ Secondary ☐ Parallel
List any other air contaminant sources that are also vented to this control equipment:
_____

☐ **Wet Scrubber**

Manufacturer: _____ Year installed: _____
What do you call this control equipment: _____
Pollutant(s) controlled: ☐ PE ☐ OC ☐ SO_2 ☐ NOx ☐ CO ☐ Other _____
Estimated capture efficiency (%):_____ Basis for efficiency: _____
Design control efficiency (%):_____ Basis for efficiency: _____
Type: ☐ Spray chamber ☐ Packed bed ☐ Impingement ☐ Venturi ☐ Other _____
Operating pressure drop range (inches of water): Minimum: _____ Maximum: _____
pH range for scrubbing liquid: Minimum: _____ Maximum: _____
Scrubbing liquid flow rate (gal/min): _____
Is scrubber liquid recirculated? ☐ Yes ☐ No
Water supply pressure (psig): _____ NOTE: This item for spray chambers only.
☐ This is the only control equipment on this air contaminant source
If no, this control equipment is: ☐ Primary ☐ Secondary ☐ Parallel
List any other air contaminant sources that are also vented to this control equipment:
_____

☐ **Electrostatic Precipitator**

Manufacturer: _____ Year installed: _____
What do you call this control equipment: _____
Pollutant(s) controlled: ☐ PE ☐ OC ☐ SO_2 ☐ NOx ☐ CO ☐ Other _____

Estimated capture efficiency (%):_____ Basis for efficiency: _____
Design control efficiency (%):_____ Basis for efficiency: _____
Type: ☐ Plate-wire ☐ Flat-plate ☐ Tubular ☐ Wet ☐ Other _____
Number of operating fields: _____

☐ This is the only control equipment on this air contaminant source
If no, this control equipment is: ☐ Primary ☐ Secondary ☐ Parallel
List any other air contaminant sources that are also vented to this control equipment:
_____

☐ **Concentrator**
Manufacturer: _____ Year installed: _____
What do you call this control equipment: _____
Pollutant(s) controlled: ☐ PE ☐ OC ☐ SO_2 ☐ NOx ☐ CO ☐ Other _____
Estimated capture efficiency (%):_____ Basis for efficiency: _____
Design regeneration cycle time (minutes): _____
Minimum desorption air stream temperature (^oF): _____
Rotational rate (revolutions/hour): _____
☐ This is the only control equipment on this air contaminant source
If no, this control equipment is: ☐ Primary ☐ Secondary ☐ Parallel
List any other air contaminant sources that are also vented to this control equipment:
_____

☐ **Catalytic Incinerator**
Manufacturer: _____ Year installed: _____
What do you call this control equipment: _____
Pollutant(s) controlled: ☐ PE ☐ OC ☐ SO_2 ☐ NOx ☐ CO ☐ Other _____
Estimated capture efficiency (%):_____ Basis for efficiency: _____
Design control efficiency (%):_____ Basis for efficiency: _____
Minimum inlet gas temperature (^oF): _____
Combustion chamber residence time (seconds): _____
Minimum temperature difference (^oF) across catalyst during air contaminant source operation: _____
☐ This is the only control equipment on this air contaminant source
If no, this control equipment is: ☐ Primary ☐ Secondary ☐ Parallel
List any other air contaminant sources that are also vented to this control equipment:
_____

☐ **Thermal Incinerator/Thermal Oxidizer**
Manufacturer: _____ Year installed: _____
What do you call this control equipment: _____
Pollutant(s) controlled: ☐ PE ☐ OC ☐ SO_2 ☐ NOx ☐ CO ☐ Other _____
Estimated capture efficiency (%):_____ Basis for efficiency: _____
Design control efficiency (%):_____ Basis for efficiency: _____
Minimum operating temperature (^oF) and location: _____ (See line by line instructions.)
Combustion chamber residence time (seconds): _____
☐ This is the only control equipment on this air contaminant source
If no, this control equipment is: ☐ Primary ☐ Secondary ☐ Parallel
List any other air contaminant sources that are also vented to this control equipment:
_____

☐ **Flare**
Manufacturer: _____ Year installed: _____
What do you call this control equipment: _____
Pollutant(s) controlled: ☐ PE ☐ OC ☐ SO_2 ☐ NOx ☐ CO ☐ Other _____
Estimated capture efficiency (%):_____ Basis for efficiency: _____
Design control efficiency (%):_____ Basis for efficiency: _____
Type: ☐ Enclosed ☐ Elevated (open)
Ignition device: ☐ Electric arc ☐ Pilot flame
Flame presence sensor: ☐ Yes ☐ No
☐ This is the only control equipment on this air contaminant source

If no, this control equipment is: ☐ Primary ☐ Secondary ☐ Parallel
List any other air contaminant sources that are also vented to this control equipment:
_____

☐ **Condenser**
Manufacturer: _____ Year installed: _____
What do you call this control equipment: _____
Pollutant(s) controlled: ☐ PE ☐ OC ☐ SO_2 ☐ NOx ☐ CO ☐ Other _____
Estimated capture efficiency (%):_____ Basis for efficiency: _____
Design control efficiency (%):_____ Basis for efficiency: _____

Type: ☐ Indirect contact ☐ Direct contact
Maximum exhaust gas temperature (^{o}F) during air contaminant source operation: _____
Coolant type: _____
Design coolant temperature (^{o}F): Minimum _____ Maximum _____
Design coolant flow rate (gpm): _____
☐ This is the only control equipment on this air contaminant source
If no, this control equipment is: ☐ Primary ☐ Secondary ☐ Parallel
List any other air contaminant sources that are also vented to this control equipment:
_____

☐ **Carbon Absorber**
Manufacturer: _____ Year installed: _____
What do you call this control equipment: _____
Pollutant(s) controlled: ☐ PE ☐ OC ☐ SO_2 ☐ NOx ☐ CO ☐ Other _____
Estimated capture efficiency (%):_____ Basis for efficiency: _____
Design control efficiency (%):_____ Basis for efficiency: _____
Type: ☐ On-site regenerative ☐ Disposable
Maximum design outlet organic compound concentration (ppmv): _____
Carbon replacement frequency or regeneration cycle time (specify units): _____
Maximum temperature of the carbon bed, after regeneration (including any cooling cycle): _____
☐ This is the only control equipment on this air contaminant source
If no, this control equipment is: ☐ Primary ☐ Secondary ☐ Parallel
List any other air contaminant sources that are also vented to this control equipment:
_____

☐ **Dry Scrubber**
Manufacturer: _____ Year installed: _____
What do you call this control equipment: _____
Pollutant(s) controlled: ☐ PE ☐ OC ☐ SO_2 ☐ NOx ☐ CO ☐ Other _____
Estimated capture efficiency (%):_____ Basis for efficiency: _____
Design control efficiency (%):_____ Basis for efficiency: _____
Reagent(s) used: Type: _____ Injection rate(s): _____
Operating pressure drop range (inches of water): Minimum: _____ Maximum: _____
☐ This is the only control equipment on this air contaminant source
If no, this control equipment is: ☐ Primary ☐ Secondary ☐ Parallel
List any other air contaminant sources that are also vented to this control equipment:
_____

☐ **Paint booth filter**
Type: ☐ Paper ☐ Fiberglass ☐ Water curtain ☐ Other _____
Design control efficiency (%):_____ Basis for efficiency: _____

☒ **Other**, describe Enclosures
Manufacturer: _____ Year installed: _____
What do you call this control equipment: Partial and total enclosure (transfer point)
Pollutant(s) controlled: ☒ PE ☐ OC ☐ SO_2 ☐ NOx ☐ CO ☐ Other _____
Estimated capture efficiency (%):NA Basis for efficiency: _____
Design control efficiency (%): 70% Basis for efficiency: Ohio RACM
☒ This is the only control equipment on this air contaminant source

If no, this control equipment is: ☐ Primary ☐ Secondary ☐ Parallel
List any other air contaminant sources that are also vented to this control equipment:
_____

6. Attach a Process or Activity Flow Diagram to this application for each air contaminant source included in the application. The diagram should indicate their relationships to one another. See the line by line PTI instructions for additional information.
See Permit Application Text

7. Emissions egress point(s) information: PTIs which allow total emissions in excess of the thresholds listed below will be subject to an air quality modeling analysis. This analysis is to assure that the impact from the requested project will not exceed Ohio=s Acceptable Incremental Impacts for criteria pollutants and/or Maximum Allowable Ground Level Concentrations (MAGLC) for air toxics. Permit requests that would have unacceptable impacts can not be approved as proposed. See the line by line PTI instructions for additional information.

   Complete the tables below if the requested allowable annual emission rate for this PTI exceeds any of the following:

   - Particulate Matter (PM10): 10 tons per year
   - Sulfur Dioxide (SO2): 25 tons per year
   - Nitrogen Oxides (NOx): 25 tons per year
   - Carbon Monoxide (CO): 100 tons per year
   - Air Toxic: 1 ton per year. An air toxic is any air pollutant for which the American Council of Governmental Industrial Hygienists (ACGIH) has established a Threshold Limit Value (TLV).

   Complete Table 7-A below for each stack emissions egress point. An egress point is a point at which emissions from an air contaminant source are released into the ambient (outside) air. List each individual egress point on a separate line.

Table 7-A, Stack Egress Point Information

Company Name or ID for the Egress Point (examples: Stack A; Boiler Stack; etc.)	Type Code*	Stack Egress Point Shape and Dimensions (in)(examples: round 10 inch ID; rectangular 14 X 16 inches; etc.)	Stack Egress Point Height from the Ground (ft)	Stack Temp. at Max. Capacity (F)	Stack Flow Rate at Max. Capacity (ACFM)	Minimum Distance to the Property Line (ft)
Coke screening	A	4.3 ft	27	70	50,000	

*Type codes for stack egress points:

A. vertical stack (unobstructed): There are no obstructions to upward flow in or on the stack such as a rain cap.
B. vertical stack (obstructed): There are obstructions to the upward flow, such as a rain cap, which prevents

or inhibits the air flow in a vertical direction.

C. non-vertical stack: The stack directs the air flow in a direction which is not directly upward.

Complete Table 7-B below for each fugitive emissions egress point. List each individual egress point on a separate line. Refer to the description of the fugitive egress point type codes below the table for use in completing the type code column of the table. For air contaminant sources like roadways and storage piles, only the first 5 columns need to be completed. For an air contaminant source with multiple fugitive emissions egress points, include only the primary egress points.

Table 7-B, Fugitive Egress Point Information

Company ID for the Egress Point (examples; Garage Door B, Building C; Roof Monitor; etc.)	Type Code*	Egress Point Description (examples: garage door, 12 X 30 feet, west wall; outside gravel storage piles; etc.)	Fugitive Egress Point Height from the Ground (ft)	Minimum Distance to the Property Line (ft)	Exit Gas Temp. (F)
Coke Transfer	F				

*Type codes for fugitive egress point:

D. door or window

E. other opening in the building without a duct

F. no stack and no building enclosing the air contaminant source (e.g., roadways)

Complete Table 7-C below for each Stack Egress Point identified in Table 7-A above. In each case, use the dimensions of the largest nearby building, building segment or structure. List each individual egress point on a separate line. Use the same Company Name or ID for the Egress Point in Table 7-C that was used in Table 7-A. See the line by line PTI instructions for additional information.

Table 7-C, Egress Point Additional Information (Add rows as necessary)

Company ID or Name for the Egress Point	Building Height (ft)	Building Width (ft)	Building Length (ft)

8. Request for Federally Enforceable Limits

As part of this permit application, do you wish to propose voluntary restrictions to limit emissions in order to avoid specific requirements listed below, (i.e., are you requesting federally enforceable limits to obtain synthetic minor status)?

☐ yes
☒ no
☐ not sure - please contact me if this affects me

If yes, why are you requesting federally enforceable limits? Check all that apply.

a. ☐ to avoid being a major source (see OAC rule 3745-77-01)
b. ☐ to avoid being a major MACT source (see OAC rule 3745-31-01)
c. ☐ to avoid being a major modification (see OAC rule 3745-31-01)
d. ☐ to avoid being a major stationary source (see OAC rule 3745-31-01)
e. ☐ to avoid an air dispersion modeling requirement (see Engineering Guide # 69)
f. ☐ to avoid another requirement. Describe: _____

If you checked a., b. or d., please attach a facility-wide potential to emit (PTE) analysis (for each pollutant) and synthetic minor strategy to this application. (See line by line instructions for definition of PTE.) If you checked c., please attach a net emission change analysis to this application.

9. If this air contaminant source utilizes any continuous emissions monitoring equipment for indicating or demonstrating compliance, complete the following table. This does not include continuous parametric monitoring systems.

Company ID for Egress Point	**Type of Monitor**	**Applicable performance specification (40 CFR 60, Appendix B)**	**Pollutant(s) Monitored**

10. Do you wish to permit this air contaminant source as a portable source, allowing relocation within the state in accordance with OAC rule 3745-31-03 or OAC rule 3745-31-05?

☐ yes - Note: notification requirements in rules cited above must be followed.
☒ no

11. The appropriate Emissions Activity Category (EAC) form(s) must be completed and attached for each air contaminant source. At least one complete EAC form must be submitted for each air contaminant source for the application to be considered complete. Refer to the list attached to the PTI instructions.

FOR OHIO EPA USE
FACILITY ID:_____
EU ID:_____ PTI#:_____

EMISSIONS ACTIVITY CATEGORY FORM
MATERIAL HANDLING: FUGITIVE DUST EMISSIONS

This form is to be completed for any material handling operation with fugitive dust emissions. State/Federal regulations which may apply to material handling operations are listed in the instructions. Note that there may be other regulations which apply to this emissions unit which are not included in this list.

1. Reason this form is being submitted (Check one)

   ☒ New Permit ☐ Renewal or Modification of Air Permit Number(s) (e.g. F001) F004

2. Maximum Operating Schedule: 24 hours per day; 365 days per year

   If the schedule is less than 24 hours/day or 365 days/year, what limits the schedule to less than maximum? See instructions for examples. _____

3. What is the material being handled? Coke

4. Mean wind speed at or near facility 9.9 miles per hour

5. Complete the following table for all unloading operations.

ID	Type of Unloading (see examples below)	Material Unloaded	Annual Quantity Unloaded (tons/yr)	Hourly Maximum Unloading Rate (tons/hr)	Avg. Moisture Content, as Unloaded (%)
A	Truck: ☐ dump ☐ pneumatic Vessel: ☐ clamshell ☐ bucket ladder Rail car: ☐ side dump ☐ bottom dump ☐ rotary dump ☐ pneumatic Other: _____				
B	Truck: ☐ dump ☐ pneumatic Vessel: ☐ clamshell ☐ bucket ladder Rail car: ☐ side dump ☐ bottom dump ☐ rotary dump ☐ pneumatic Other: _____				
C	Truck: ☐ dump ☐ pneumatic Vessel: ☐ clamshell ☐ bucket ladder Rail car: ☐ side dump ☐ bottom dump ☐ rotary dump ☐ pneumatic Other: _____				

D	Truck: ☐ dump ☐ pneumatic Vessel: ☐ clamshell ☐ bucket ladder Rail car: ☐ side dump ☐ bottom dump ☐ rotary dump ☐ pneumatic Other: _____				

6. Complete the following table for all loading operations.

ID	Type of Loading (see examples below)	Material Loaded	Annual Quantity Loaded (tons/yr)	Hourly Maximum Loading Rate (tons/hr)	Avg. Moisture Content, as Loaded (%)
E	☐ front end loader ☐ under pile load out ☐ bucket well reclaimer ☐ rake reclaimer ☒ other: Conveyor to AK Steel (alternate rail loadout)	Coke	613,828	500	7%
F	☐ front end loader ☐ under pile load out ☐ bucket well reclaimer ☐ rake reclaimer ☒ other: Truck	Coke Breeze	40,621	500	7%
G	☐ front end loader ☐ under pile load out ☐ bucket well reclaimer ☐ rake reclaimer ☐ other: _____				
H	☐ front end loader ☐ under pile load out ☐ bucket well reclaimer ☐ rake reclaimer ☐ other: _____				

7. Complete the following table for all transfer operations.

ID	Type of Transfer Point (see examples below)	Number of Such Points	Type of Material Handled	Max. Transfer Rate (tons/hr)
I	☐ Load/unload conveyor: ☐ vibrating ☐ belt ☐ screw ☐ bucket elevator ☒ belt conveyor to belt conveyor Other:_____	17	Coke	500
J	☐ Load/unload conveyor: ☐ vibrating ☐ belt ☐ screw ☐ bucket elevator ☒ belt conveyor to belt conveyor Other:_____	4	Coke	500
K	☐ Load/unload conveyor: ☐ vibrating ☐ belt ☐ screw ☐ bucket elevator ☒ belt conveyor to belt conveyor Other:_____	1	Coke	500
L	☐ Load/unload conveyor: ☐ vibrating ☐ belt ☐ screw ☐ bucket elevator ☐ belt conveyor to belt conveyor Other:_____			
M	☐ Load/unload conveyor: ☐ vibrating ☐ belt ☐ screw ☐ bucket elevator ☐ belt conveyor to belt conveyor Other:_____			
N	☐ Load/unload conveyor: ☐ vibrating ☐ belt ☐ screw ☐ bucket elevator ☐ belt conveyor to belt conveyor Other:_____			
O	☐ Load/unload conveyor: ☐ vibrating ☐ belt ☐ screw ☐ bucket elevator ☐ belt conveyor to belt conveyor Other:_____			

8. Summarize the material handling operations covered in items 5 through 7 above and identify the applicable control method(s) from available options. Complete the remaining table based upon the selected control method(s).

ID	Enclosure, Control Equipment (describe)	Chemical Stabilization	Application Frequency	Overall Control Eff. (%)	Basis for Overall Control Efficiency
A		☐ water ☐ dust suppressant ☐ other: _____			
B		☐ water ☐ dust suppressant ☐ other: _____			
C		☐ water ☐ dust suppressant ☐ other: _____			
D		☐ water ☐ dust suppressant ☐ other: _____			
E	Conveyor to AK Steel (enclosed)	☐ water ☐ dust suppressant ☒ other: wet material		70%	Ohio RACM
F	Coke breeze bin loadout (enclosed)	☐ water ☐ dust suppressant ☐ other: _____		70%	Ohio RACM
G		☐ water ☐ dust suppressant ☐ other: _____			
H		☐ water ☐ dust suppressant ☐ other: _____			
I	Enclosure (coke transfer)	☐ water ☐ dust suppressant ☒ other: wet material		70%	Ohio RACM
J	No enclosure (coke transfer)	☐ water ☐ dust suppressant ☒ other: wet material			

K	Partial enclosure (coke transfer)	☐ water ☐ dust suppressant ☐ other: _____		70%	Ohio RACM
L		☐ water ☐ dust suppressant ☐ other: _____			
M		☐ water ☐ dust suppressant ☐ other: _____			
N		☐ water ☐ dust suppressant ☐ other: _____			
O		☐ water ☐ dust suppressant ☐ other: _____			

Appendix B
SUPPORTING CALCULATIONS

Middletown Coke Company - Heat Recovery Coke Plant Assumptions / Major Inputs										
Number of Ovens			100							
Maximum coal charge tonnage			50	wet tons/oven						
Coal moisture			8.0%							
Coal sulfur			1.30%		Calculated emission factor =			23.92	lbs SO2/wet ton coal	
Furnace coke dry yield			68.0%							
Breeze fraction (of dry coal)			4.5%							
Coke moisture			7.0%							
Ovens/HRSG			20		Calculated HRSGs =			5		
Ovens/waste heat stack			20		Calculated waste heat stacks =			5		
Days HRSG offline/year			15		HRSG maintenance days/year =			10		
SO_2 removal in spray dryer/baghouse			90%		SD/BH maintenance days/year =			5		
Coke Pile			1.5	acres						
Coal pile #1 (Dead Pile)			1.2	acres						
Coal pile #2 (Live Pile)			1.3	acres						
Emergency Breeze Pile			0.2	acres						
Emergency Screened Coke Storage Pile			0.3	acres						
Thaw Shed Maximum Fuel Used			19.60	MMcf/yr						

Middletown Coke Company **100 Ovens**

0.6 MM tons furnace coke/year

Assumptions

	% moisture	MM wet tons/yr	MM dry tons/yr	
Furnace Coke Production:	7.0%	0.6138	0.5709	Based on 2500
Coal Used:	8.0%	0.9125	0.8395	tons wet coal/day charge rate
Coke Breeze:	7.0%	0.0406	0.0378	
Total Coke Production:		0.6544	0.6086	
Yield:	68.0% (dry coke to dry coal)		4.5% dry coal to dry breeze	

Individual waste heat stacks:

Days per year / individual wh stack	15	Days with 20.0%	gas through wh stack	50
Percent gas through ind wh stacks	4.1%	Days with 100% gas through wh stacks		5
		Days with 100% gas through main stack		310

Emission Units	Estimated Emissions																	
	PM		PM_{10}		$PM_{2.5}$		SO_2		NO_X		CO		VOC		Lead		H_2SO_4
	EF	Emissions (tons/yr)	EF	Emissions (tons/yr)	EF	Emissions (tons/yr)	EF	Emissions (tons/yr)	EF	Emissions (tons/yr)	EF	Emissions (tons/yr)	EF	Emissions (tons/yr)	EF	Emissions (tons/yr)	Emissions (tons/yr)
Coal Unloading, Storage, and Handling		9.39		4.50		1.51											
Coal Crushing	0.0016	0.73	0.0008	0.37	0.00024	0.11											
Thaw Shed	7.6	0.07	7.6	0.07	7.6	0.07	0.6	0.01	100.0	0.98	84.0	0.82	5.5	0.05			
Charging (fugitive)	0.0027	1.23	0.00081	0.37	0.00041	0.18											
Charging (baghouse) [1]	0.016	6.72	0.016	6.72	0.016	6.72	0.0003	0.14			0.0028	1.28	0.002	0.91	1.00E-07	4.56E-05	neg
Main stack [2]	0.014	131.40	0.014	131.40	0.014	131.40	2.39	1091.35	1.00	456.25	20	95.54	10	20.47	2.28E-04	0.10	11.13
Individual waste heat stacks [2]	0.083	32.01	0.083	32.01	0.083	32.01	23.92	448.50	1.00	18.75	20	3.93	10	0.84	4.56E-03	0.09	22.88
Pushing (collector) [3]	0.080	26.18	0.080	26.18	0.080	26.18	0.098	44.71	0.019	8.67	0.063	28.74	0.020	9.13	1.53E-05	6.98E-03	2.28
Quenching [4]	0.12	54.75	0.044	20.08	0.027	12.32									8.69E-05	3.96E-02	
Coke screening [5]	0.008	15.02	0.008	15.02	0.008	15.02											
Coke Storage, Handling, and Loadout		8.34		3.98		1.30											
Lime Silo		0.13		0.13		0.13											
FGD Silo		0.01		0.01		0.01											
Paved Roads & Parking		15.48		3.02		0.76											
Total		**301.47**		**243.85**		**227.72**		**1584.71**		**484.65**		**130.31**		**31.41**		**0.24**	**36.29**

[1] EF lb/wet ton coal, particulate lb/dry ton coal

[2] EF lb/wet ton coal, particulate grains/dscf, CO and VOC ppm

[3] EF lb/wet ton coal, particulate lb/wet ton coke

[4] EF lb/wet ton coal

[5] EF grains/dscf

Notes for emissions spreadsheet:

Waste gas flow = 250,000 dscfm (main stack)

Coke screening baghouse gas flow = 50,000 dscfm

Middletown Coke Company — 100 Ovens

Material Handling and Vehicles Fugitive PM / PM_{10} / $PM_{2.5}$

		Thruput	Conv. Enc/Unc	PM (lb/hr)	PM_{10} (lb/hr)	$PM_{2.5}$ (lb/hr)
x1	Coal Unloading	100%	Controlled	0.0528	0.0250	0.0078
x2	To Unloader Conveyor	100%	Enc	0.0088	0.0042	0.0013
x3	Coal Transfer #1	100%	Enc	0.0088	0.0042	0.0013
x4	Transfer to Stacker Conveyor	100%	Unc	0.1760	0.0832	0.0262
x5	Transfer to Stacker	100%	Unc	0.1760	0.0832	0.0262
x6	Coal Storage Pile #1 In	50%	Unc	0.0880	0.0416	0.0131
x7	Coal Storage Pile #1 (Dead Pile)		Controlled	0.2520	0.1260	0.0504
x8	Coal Storage Pile#2 Out	50%	Unc	0.0880	0.0416	0.0131
x9	Coal Transfer from Storage Pile #1 to Storage Pile #2	50%	Unc	0.0880	0.0416	0.0131
x10	Coal Storage Pile In	50%	Unc	0.0880	0.0416	0.0131
x11	Coal Storage Pile #2 (Live Pile)		Controlled	0.2730	0.1365	0.0546
x12	Coal Storage Pile Out	100%	Enc	0.0088	0.0042	0.0013
x13	Stacker (Front End Loadout)	20%	Unc	0.0352	0.0166	0.0052
x14	Transfer to Stacker Reclaim Hopper	20%	Unc	0.0352	0.0166	0.0052
x15	Transfer to Coal Crushing Tower	100%	Enc	0.0088	0.0042	0.0013
x16	Coal Crushing	100%	Controlled	0.1667	0.0833	0.0250
x17	Transfer to Silo Feed Conveyor	100%	Enc	0.0088	0.0042	0.0013
x18	Transfer to Silo	100%	Enc	0.0088	0.0042	0.0013
x19	Transfer to Batch Bin	100%	Enc	0.0088	0.0042	0.0013
x20	Transfer to tripper conveyor	100%	Unc	0.1760	0.0832	0.0262
x21	Tripper point 1	100%	Unc	0.1760	0.0832	0.0262
x22	Tripper point 2	100%	Unc	0.1760	0.0832	0.0262
x23	Tripper point 3	100%	Unc	0.1760	0.0832	0.0262
x24	Extra Coal Transfer Point #1	100%	Enc	0.0088	0.0042	0.0013
x25	Extra Coal Transfer Point #2	100%	Enc	0.0088	0.0042	0.0013
x26	Extra Coal Transfer Point #3	100%	Enc	0.0088	0.0042	0.0013
y1	Coke from Hot Car to Quench Car	100%	Partial	0.0379	0.0179	0.0056
y2	Coke from Quench Car to Wharf	100%	Unc	0.1262	0.0597	0.0188
y3	Transfer to Wharf conveyor	100%	Unc	0.1262	0.0597	0.0188
y4	Coke Transfer #1	100%	Enc	0.0379	0.0179	0.0056
y5	Coke Transfer #2	100%	Enc	0.0379	0.0179	0.0056
y6	Coke Transfer (Stacking Conveyor)	100%	Unc	0.1262	0.0597	0.0188
y7	Coke emergency storage pile in	100%	Unc	0.1262	0.0597	0.0188
y8	Coke emergency storage pile wind		Unc	0.1369	0.0685	0.0274
y9	Coke emergency storage pile out	100%	Unc	0.1262	0.0597	0.0188
y10	Unloading to coke reclaim	100%	Unc	0.1262	0.0597	0.0188
y11	Coke Transfer (Plant Feed Conveyor)	120%	Enc	0.0454	0.0215	0.0068
y12	Transfer to Screening Station	120%	Enc	0.0454	0.0215	0.0068
y13	Transfer to Recirculating Conveyor	20%	Enc	0.0076	0.0036	0.0011
y14	Recirculating Transfer to Plant Feed Conveyor	20%	Enc	0.0076	0.0036	0.0011
y15	Transfer Breeze to Bunker	6.2%	Enc	0.0024	0.0011	0.0003
y16	Breeze loadout at bunker	6.2%	Enc	0.0024	0.0011	0.0003
y17	Emergency Breeze Pile In	6.2%	Unc	0.0078	0.0037	0.0012
y18	Emergency Breeze Pile		Unc	0.0895	0.0447	0.0179
y19	Emergency Breeze Pile Out	6.2%	Unc	0.0078	0.0037	0.0012
y20	Transfer to coke loadout conveyor	100%	Enc	0.0379	0.0179	0.0056
y21	Coke loadout to boom	100%	Enc	0.0379	0.0179	0.0056
y22	Transfer to coke product conveyor #1	100%	Enc	0.0379	0.0179	0.0056
y23	Coke Transfer #3	100%	Enc	0.0379	0.0179	0.0056
y24	Emergency Screened coke storage pile in	100%	Unc	0.1184	0.0560	0.0176
y25	Emergency Screened coke storage pile		Unc	0.0274	0.0137	0.0055
y26	Emergency Screened coke storage pile out	100%	Unc	0.1184	0.0560	0.0176
y27	Transfer to coke product conveyor #2	100%	Enc	0.0379	0.0179	0.0056
y28	Coke Transfer #4	100%	Enc	0.0379	0.0179	0.0056
y29	Transfer to coke product conveyor #3	100%	Enc	0.0379	0.0179	0.0056
y30	Coket Transfer #5	100%	Enc	0.0379	0.0179	0.0056
y32	Extra Coke Transfer Point #1	100%	Enc	0.0379	0.0179	0.0056
y33	Extra Coke Transfer Point #2	100%	Enc	0.0379	0.0179	0.0056
y34	Extra Coke Transfer Point #3	100%	Enc	0.0379	0.0179	0.0056
	Vehicles			3.54	0.69	0.17
	Total fugitive			7.75	2.71	0.84
	Annual (tpy)					
	Coal Piles			4.19	2.04	0.74
	Coal handling			5.93	2.83	0.88
	Coke Piles			3.32	1.60	0.55
	Coke handling			5.02	2.37	0.75
	Vehicles			15.48	3.02	0.76
	Total annual fugitive (tpy)			**33.95**	**11.87**	**3.68**

Maximum Production data:

Maximum daily rate = 2,500 tons wet coal/day

Maximum daily furnace coke = 1,682 tons wet coke/day

Maximum ROV coke = 1,793 tons wet coke/day

Conv. Transfer	PM EF (lb/ton)	PM_{10} EF (lb/ton)	$PM_{2.5}$ EF (lb/ton)
Coal crushing			
- controlled	1.60E-03	8.00E-04	2.40E-04
Coal Unloading			
- controlled	5.07E-04	2.40E-04	7.53E-05
Coal Transfer points			
- enclosed	8.45E-05	4.00E-05	1.26E-05
- partial	5.07E-04	2.40E-04	7.53E-05
- unenclosed	1.69E-03	7.99E-04	2.51E-04
Coke Transfer points			
- enclosed	5.07E-04	2.40E-04	7.53E-05
- partial	5.07E-04	2.40E-04	7.53E-05
- unenclosed	1.69E-03	7.99E-04	2.51E-04
Coal Pile			
-uncontrolled (lb/acre/day)	10.08	5.04	2.02
-controlled (lb/acre/day)	5.04	2.52	1.01

	PM (tons/yr)	PM_{10} (tons/yr)	$PM_{2.5}$ (tons/yr)
F002	7.51	3.64	1.29
F003	5.93	2.83	0.88
F004	20.04	17.39	15.76

URS Corporation CALCULATION SHEET **Calc. No.** **3**

Signature: A. Tang Date: 04/03/2008 Checked: J. Carson Date: 04/03/2008
Project: Middletown Coke Company Project No.: 39400297.26000
Subject: Pollutant Emissions Calculations

Purpose
To estimate criteria pollutant emissions from the coal storage piles.
(Includes coal load-in, fugitives from the pile itself, and coal loadout)
Emissions are broken down by part.
Total emissions for all storage piles included.

Part I. Coal Load-In

Purpose
To estimate criteria pollutant emissions due to coal load-in.

Basis
Two storage piles (Open storage piles)
Total number of coal transfer points = 2 (one each) One "live" pile (Pile #2) with underpile conveyors
One "dead" pile (Pile #1)
Load-in by radial stacker
Maximum annual coal charge = 912,500 tons wet coal/yr
Maximum daily coal charge = 2,500 tons wet coal/day

Assumptions
Coal load in to Open storage piles
Coal is loaded onto only 1 pile at a time
Assume the maximum annual coal charge for a conservative estimate of emissions
50% of coal loaded to each pile
Control efficiency for fully enclosed points for PM, PM_{10} and $PM_{2.5}$ = 95% (estimated from Ohio RACM Table 2.2.1-2)

Calculation
Use emission factors for coal handling from AP-42, 5th edition, Table 13.2.4-1 Equation (1)

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

where:
k, particle size multiplier for PM = 0.74 (from AP-42, 5th edition)
k, particle size multiplier for PM_{10} = 0.35 (from AP-42, 5th edition)
k, particle size multiplier for $PM_{2.5}$ = 0.11 (from AP-42, 5th edition)
U, mean wind speed = 9.9 mph from Tanks 4.09 Meteorological database (Dayton, OH)
M, moisture content = 4.80 % (for coal - max for equation)

PM EF (lb/ton coal) = 0.00169
PM_{10} EF (lb/ton coal) = 0.00080
$PM_{2.5}$ EF (lb/ton coal) = 0.00025

Potential emissions estimation:

PM (tons/yr) = PM EF * tons coal transferred
= (0.00169 lb/ton coal) * (tons coal handled) * (ton/2000 lb)
= 0.39 tons PM/yr Coal Pile #1
= 0.39 tons PM/yr Coal Pile #2

PM_{10} (tons/yr) = PM_{10} EF * tons coal transferred
= (0.00080 lb/ton coal) * (tons coal handled) * (ton/2000 lb)
= 0.18 tons PM_{10}/yr Coal Pile #1
= 0.18 tons PM_{10}/yr Coal Pile #2

$PM_{2.5}$ (tons/yr) = $PM_{2.5}$ EF * tons coal transferred
= (0.00025 lb/ton coal) * (tons coal handled) * (ton/2000 lb)
= 0.06 tons $PM_{2.5}$/yr Coal Pile #1
= 0.06 tons $PM_{2.5}$/yr Coal Pile #2

Maximum Hourly Emissions:

PM (lb/hr) = (tons/day) * (day/24 hours) * (0.00169 lb/ton coal)
= 0.088 lb PM/hr Coal Pile #1
= 0.088 lb PM/hr Coal Pile #2

PM_{10} (lb/hr) = (tons/day) * (day/24 hours) * ((0.00080 lb/ton coal)
= 0.042 lb PM_{10}/hr Coal Pile #1
= 0.042 lb PM_{10}/hr Coal Pile #2

$PM_{2.5}$ (lb/hr) = (tons/day) * (day/24 hours) * ((0.00025 lb/ton coal)
= 0.013 lb $PM_{2.5}$/hr Coal Pile #1
= 0.013 lb $PM_{2.5}$/hr Coal Pile #2

URS Corporation CALCULATION SHEET **Calc. No.** **3**

Signature: A. Tang Date: 04/03/2008 Checked: J. Carson Date: 04/03/2008
Project: Middletown Coke Company Project No.: 39400297.26000
Subject: Pollutant Emissions Calculations

Part II. Coal Storage Piles

Purpose
To estimate criteria pollutant emissions from the coal storage piles.

Basis

Total Coal Storage acres =	1.2 acres	Coal Pile #1 (Dead Pile)
	1.3 acres	Coal Pile #2 (Live Pile)

Assumptions

Number days pile worked in =	365 days	(worst case - work both piles everyday)
Control efficiency for Open storage pile =	50% (watering)	

Calculation
Use emission factors for storage pile fugitive emissions from AP-40, Section 4, Fugitive Emissions, p. 136, Equation (5)

EF (lb/day/acre) = k * 1.7 * (s/1.5) * ((365-p)/235) * (f/15)

where:

k, particle size multiplier for PM =	1	
k, particle size multiplier for PM_{10} =	0.5	
k, particle size multiplier for $PM_{2.5}$ =	0.2	
s, silt content for coal =	4.6 %	(from AP-42, 5th edition, Table 13.2.4-1)
f, percentage of time that the unobstructed wind speed exceeds ≥5.4 m/s at mean pile height =	29	
p, number of days with ≥0.01 inch of precipitation per year =	130 days	(for Middletown, Ohio from AP-42, 5th edition, Figure 13.2.2-1)

PM EF (lb/day/acre) =	10.08
PM_{10} EF (lb/day/acre) =	5.04
$PM_{2.5}$ EF (lb/day/acre) =	2.02

Potential annual emissions:
PM (tons/yr) = PM EF * Acres of pile * days pile worked in * (1 - control efficiency / 100)
= (10.08 lb/day/acre) * (acres) * (365 days/yr) * (ton/2000 lb) * (1-control efficiency/100)

=	1.10	tons PM/yr	Coal Pile #1
=	1.20	tons PM/yr	Coal Pile #2

PM_{10} (tons/yr) = PM_{10} EF * Acres of pile * days pile worked in * (1-control efficiency/100)
= (5.04 lb/day/acre) * (acre) * (365 days/yr) * (ton/2000 lb) * (1-efficiency/100)

=	0.55	tons PM_{10}/yr	Coal Pile #1
=	0.60	tons PM_{10}/yr	Coal Pile #2

$PM_{2.5}$ (tons/yr) = $PM_{2.5}$ EF * Acres of pile * days pile worked in * (1-control efficiency/100)
= (2.02 lb/day/acre) * (acre) * (365 days/yr) * (ton/2000 lb) * (1-efficiency/100)

=	0.22	tons $PM_{2.5}$/yr	Coal Pile #1
=	0.24	tons $PM_{2.5}$/yr	Coal Pile #2

Maximum Hourly Emissions:
PM (lb/hr) = (tons emissions/yr) * (2000 lb/ton) * (yr/8760 hrs)

=	0.25	lb PM/hr	Coal Pile #1
=	0.27	lb PM/hr	Coal Pile #2

PM_{10} (lb/hr) = (tons emissions /yr) * (2000 lb/ton) * (yr/8760 hrs)

=	0.13	lb PM_{10}/hr	Coal Pile #1
=	0.14	lb PM_{10}/hr	Coal Pile #2

$PM_{2.5}$ (lb/hr) = (tons emissions /yr) * (2000 lb/ton) * (yr/8760 hrs)

=	0.05	lb $PM_{2.5}$/hr	Coal Pile #1
=	0.05	lb $PM_{2.5}$/hr	Coal Pile #2

URS Corporation CALCULATION SHEET **Calc. No.** **3**

Signature: A. Tang Date: 04/03/2008 Checked: J. Carson Date: 04/03/2008
Project: Middletown Coke Company Project No.: 39400297.26000
Subject: Pollutant Emissions Calculations

Part III. Coal Loadout

Purpose
To estimate criteria pollutant emissions due to coal loadout.

Basis

Storage piles (Open storage piles)	1	Coal Pile #1 (Dead Pile)
	1	Coal Pile #2 (Live Pile)
Maximum annual coal charge =	912,500	tons wet coal/yr
Maximum daily coal charge =	2,500	tons wet coal/day

Assumptions
Assume coal from coal pile #1 (50% coal) is loaded out to coal pile #2 and emissions are the same as 2 uncontrolled transfer points
Assume 100% coal load out from coal pile #2 from underpile conveyor to the ovens
Assume additional 20% loadout from front end loader (2 uncontrolled points)
Assume the maximum annual coal charge for a conservative estimate of emissions
Control efficiency for load out using Underpile converyor for PM, PM_{10} and $PM_{2.5}$= 95% (Coal Pile #2 only)

Calculation
Use emission factors for coal handling from AP-42, 5th edition, Table 13.2.4-1 Equation (1)

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

where:

k, particle size multiplier for PM =	0.74	(from AP-42, 5th edition)
k, particle size multiplier for PM_{10} =	0.35	(from AP-42, 5th edition)
k, particle size multiplier for $PM_{2.5}$ =	0.11	(from AP-42, 5th edition)
U, mean wind speed =	9.9	mph from Tanks 4.09 Meteorological database (Dayton, OH)
M, moisture content =	4.80	% (for coal - max for equation)

PM EF (lb/ton coal) =	0.00169
PM_{10} EF (lb/ton coal) =	0.00080
$PM_{2.5}$ EF (lb/ton coal) =	0.00025

Potential emissions estimation:

PM (tons/yr) = (EF lb/ton coal) * (tons coal handled) *(# transfer points) * (ton/2000 lb) * (1 - efficiency/100)

=	0.771	tons PM/yr	Coal Pile #1 to Coal Pile #2
=	0.039	tons PM/yr	Coal Pile #2
=	0.308	tons PM/yr	Front end loader

PM_{10} (tons/yr) = (EF lb/ton coal) * (tons coal handled) * (# transfer points) * (ton/2000 lb) * (1- efficiency/100)

=	0.365	tons PM_{10}/yr	Coal Pile #1 to Coal Pile #2
=	0.018	tons PM_{10}/yr	Coal Pile #2
=	0.146	tons PM_{10}/yr	Front end loader

$PM_{2.5}$ (tons/yr) = (EF lb/ton coal) * (tons coal handled) * (# transfer points) * (ton/2000 lb) * (1- efficiency/100)

=	0.115	tons $PM_{2.5}$/yr	Coal Pile #1 to Coal Pile #2
=	0.006	tons $PM_{2.5}$/yr	Coal Pile #2
=	0.046	tons $PM_{2.5}$/yr	Front end loader

Maximum Hourly Emissions:

PM (lb/hr) = (EF lb/ton coal) * (tons/day) * (1 -control efficiency/100) * (day/24 hours)

=	0.1760	lb PM/hr	Coal Pile #1 to Coal Pile #2
=	0.0088	lb PM/hr	Coal Pile #2
=	0.0704	lb PM/hr	Front end loader

PM_{10} (lb/hr) = (EF lb/ton coal) * (tons/day) * (100% -control efficiency/100) * (day/24 hours)

=	0.0832	lb PM_{10}/hr	Coal Pile #1 to Coal Pile #2
=	0.0042	lb PM_{10}/hr	Coal Pile #2
=	0.0333	lb PM_{10}/hr	Front end loader

$PM_{2.5}$ (lb/hr) = (EF lb/ton coal) * (tons/day) * (100% -control efficiency/100) * (day/24 hours)

=	0.0262	lb $PM_{2.5}$/hr	Coal Pile #1 to Coal Pile #2
=	0.0013	lb $PM_{2.5}$/hr	Coal Pile #2
=	0.0105	lb $PM_{2.5}$/hr	Front end loader

URS Corporation CALCULATION SHEET **Calc. No.** **3**

Signature: A. Tang Date: 04/03/2008 Checked: J. Carson Date: 04/03/2008
Project: Middletown Coke Company Project No.: 39400297.26000
Subject: Pollutant Emissions Calculations

Part IV. Total Coal Emissions:

Storage Piles

PM (tons/yr) = coal load-in (tons/yr) + coal pile (tons/yr) + coal loadout (tons/yr)	=	2.26	tons PM/yr total	Coal Pile #1
		1.62	tons PM/yr total	Coal Pile #2
		0.31	tons PM/yr total	Front end loader
PM_{10} (tons/yr) = coal load-in (tons/yr) + coal pile (tons/yr) + coal loadout (tons/yr)	=	1.10	tons PM_{10}/yr total	Coal Pile #1
		0.80	tons PM_{10}/yr total	Coal Pile #2
		0.15	tons PM_{10}/yr total	Front end loader
$PM_{2.5}$ (tons/yr) = coal load-in (tons/yr) + coal pile (tons/yr) + coal loadout (tons/yr)	=	0.39	tons $PM_{2.5}$/yr total	Coal Pile #1
		0.30	tons $PM_{2.5}$/yr total	Coal Pile #2
		0.05	tons $PM_{2.5}$/yr total	Front end loader
PM (lb/hr) = coal load-in (lb/hr) + coal pile (lb/hr) + coal loadout (lb/hr)	=	0.52	lb PM/hr total	Coal Pile #1
		0.37	lb PM/hr total	Coal Pile #2
		0.0704	lb PM/hr total	Front end loader
PM_{10} (lb/hr) = coal load-in (lb/hr) + coal pile (lb/hr) + coal loadout (lb/hr)	=	0.25	lb PM_{10}/hr total	Coal Pile #1
		0.18	lb PM_{10}/hr total	Coal Pile #2
		0.0333	lb PM_{10}/hr total	Front end loader
$PM_{2.5}$ (lb/hr) = coal load-in (lb/hr) + coal pile (lb/hr) + coal loadout (lb/hr)	=	0.09	lb $PM_{2.5}$/hr total	Coal Pile #1
		0.07	lb $PM_{2.5}$/hr total	Coal Pile #2
		0.0105	lb $PM_{2.5}$/hr total	Front end loader

Part V. Total Emissions from All Storage Piles (F002):

PM

Total Coal Storage Piles =	4.19	tons PM/yr	
Total Run of Oven Coke Storage Pile =	1.71	tons PM/yr	(from Calculation No. 10)
Total Emergency Coke Breeze Storage Pile =	0.46	tons PM/yr	(from Calculation No. 16)
Total Emergency Screened Coke Storage Pile =	1.16	tons PM/yr	(from Calculation No. 17)
Total Storage Piles =	7.51	tons PM/yr	

PM_{10}

Total Coal Storage Piles =	2.04	tons PM_{10}/yr	
Total Run of Oven Coke Storage Pile =	0.82	tons PM_{10}/yr	(from Calculation No. 10)
Total Emergency Coke Breeze Storage Pile =	0.23	tons PM_{10}/yr	(from Calculation No. 16)
Total Emergency Screened Coke Storage Pile =	0.55	tons PM_{10}/yr	(from Calculation No. 17)
Total Storage Piles =	3.64	tons PM_{10}/yr	

$PM_{2.5}$

Total Coal Storage Piles =	0.74	tons $PM_{2.5}$/yr	
Total Run of Oven Coke Storage Pile =	0.28	tons $PM_{2.5}$/yr	(from Calculation No. 10)
Total Emergency Coke Breeze Storage Pile =	0.09	tons $PM_{2.5}$/yr	(from Calculation No. 16)
Total Emergency Screened Coke Storage Pile =	0.18	tons $PM_{2.5}$/yr	(from Calculation No. 17)
Total Storage Piles =	1.29	tons $PM_{2.5}$/yr	

Unpaved Roads

Unlike paved roads, emission estimates for unpaved surfaces do not require a "decision" process involving surface–vehicle parameters because the AP-42 emission factor equation takes source characteristics into consideration.[2]

$$e = 0.61\left(\frac{s}{12}\right)\left(\frac{S}{48}\right)\left(\frac{W}{2.7}\right)^{0.7}\left(\frac{w}{4}\right)^{0.5}\frac{(365-p)}{365}\ \frac{\text{kg}}{\text{VKT}}$$

$$e = 2.1\left(\frac{s}{12}\right)\left(\frac{S}{30}\right)\left(\frac{W}{3}\right)^{0.7}\left(\frac{w}{4}\right)^{0.5}\frac{(365-p)}{365}\ \frac{\text{lb}}{\text{VMT}} \quad (2)$$

where: e = PM_{10} emission factor, in units stated
s = silt content of road surface material, %
S = mean vehicle speed, km/h (mi/h)
W = mean vehicle weight, mg (ton)
w = mean number of wheels (dimensionless)
p = number of days with ≥ 0.254 mm (0.01 inch) of precipitation (per Figure 11.2.1-1 of AP-42)[2]

Site-specific input parameters are strongly recommended; if this is not feasible, a summary of measured values is presented on page 11.2.1-3 of AP-42.[2]

Bulk Materials Handling

The following equation is recommended for estimating emissions from transfer operations (batch or continuous drop).[2]

$$e = k(0.0016)\frac{(U/2.2)^{1.3}}{(M/2)^{1.4}}\ (\text{kg/mg})$$

$$e = k(0.0016)\frac{(U/5)^{1.3}}{(M/2)^{1.4}}\ (\text{lb/ton}) \quad (3)$$

where: e = emission factor, in units stated
k = particle-size multiplier, dimensionless
U = mean wind speed, m/s (mi/h)
M = material moisture content, %

The particle size multiplier k varies with aerodynamic particle diameter as follows:

<30 μm	<15 μm	<10 μm	<5 μm	<2.5 μm
0.74	0.48	0.35	0.20	0.11

Again, source-specific input parameters are recommended for use in equation 3. If such are not available, Table 11.2.3-3 of AP-42 can be consulted.[2]

Storage-Pile Wind Erosion

Dust emissions may be generated by wind erosion of open aggregate storage piles and exposed areas within an industrial facility. These sources typically are characterized by nonhomogeneous surfaces impregnated with nonerodible elements (particles larger than approximately 1 cm in diameter). Field testing of coal piles and other exposed materials using a portable wind tunnel has shown that (1) threshold wind speeds exceed 5 m/s (11 mi/h) at 15 cm above the surface [or 10 m/s (22 mi/h) at 7 meters above the surface], and (2) particulate emission rates tend to decay rapidly (half-life of a few minutes) during an erosion event. In other words, these aggregate material surfaces are characterized by the finite availability of erodible material (mass/area) referred to as the erosion potential. Any natural crusting of the surface binds the erodible material, thereby reducing the erosion potential.

The emission factor for wind-generated particulate emissions from mixtures of erodible and nonerodible surface material subject to disturbance may be expressed in units of g/m^2-yr as follows[2]:

$$\text{Emission factor} = k\sum_{i=1}^{N} P_i \quad (4)$$

where: k = particle-size multiplier, dimensionless
N = number of disturbances per year
P_i = erosion potential corresponding to the observed (or probable) fastest mile of wind for the ith period between disturbances, g/m^2

The particle-size multiplier *(k)* for equation 4 varies with aerodynamic particle size, as follows:

<30 μm	<15 μm	<10 μm	<2.5 μm
1.0	0.6	0.5	0.2

This distribution of particle size within the <30-μm fraction is comparable to the distributions reported for other fugitive dust sources where wind speed is a factor. This is illustrated, for example, in the distributions for batch and continuous drop operations encompassing a number of test aggregate materials (see AP-42, Section 11.2.3).[2]

Input to the calculation of wind erosion emissions using equation 4 must be performed in a stepwise manner and is very complex. Therefore, the reader is referred to Section 11.2.3 of AP-42[2] for a detailed description of the required calculations.

For emissions from wind erosion of *active* storage piles, the following total suspended particulate (TSP, particles ≤ ~ 30 μm in aerodynamic diameter) emission factor equation is recommended:

$$E = 1.9\left(\frac{s}{1.5}\right)\left(\frac{365-p}{235}\right)\left(\frac{f}{15}\right)\ \text{kg/day/hectare}$$

$$E = 1.7\left(\frac{s}{1.5}\right)\left(\frac{365-p}{235}\right)\left(\frac{f}{15}\right)\ (\text{lb/day/acre}) \quad (5)$$

TABLE 2. Emissions Increase (ΔE) by Site Traffic Volume[a]

Particle Size Fraction[b]	Sites with >25 Vehicles/Day			Sites with <25 Vehicles/Day		
	Mean	Standard Deviation, σ	Range	Mean	Standard Deviation, σ	Range
$< \sim 30$ μm	52	28	15–80	19	7.8	14–28
<10 μm	13	6.7	4.4–20	5.5	2.3	4.2–8.1
<2.5 μm	5.1	2.6	1.7–7.8	2.2	0.88	1.6–3.2

[a]ΔE expressed in g/vehicle pass.
[b]Aerodynamic diameter.

TABLE 3. Emissions Increase (ΔE) by Construction Type[a]

Particle Size Fraction[b]	Commercial			Residential		
	Mean	Standard Deviation, σ	Range	Mean	Standard Deviation, σ	Range
$< \sim 30$ μm	65	29	15–110	39	22	10–72
<10 μm	16	9.3	4.2–25	10	5.4	2.8–19
<2.5 μm	6.3	3.6	1.6–9.7	3.9	2.1	1.1–7.3

[a]ΔE expressed in g/vehicle pass.
[b]Aerodynamic diameter.

where: E = total suspended particulate emission factor, in units indicated
s = silt content of aggregate, %
p = number of days with ≥ 0.25 mm (0.01 inch) of precipitation per year (from Figure 11.2.1-1 of AP-42[2])
f = percentage of time that the unobstructed wind speed exceeds 5.4 m/s (12 mi/h) at the mean pile height

Construction Emissions

At present, the only emission factor available in AP-42[2] is 1.2 tons/acre/mo (related to particles <30 μm Stokes' diameter) for an entire construction site. No factor has been published in AP-42[2] for demolition. However, PM_{10} emission factors have been developed for construction-site preparation using test data from a study conducted in Minnesota for topsoil removal, earth moving (cut-and-fill), and truck haulage operations.[3] For these operations, the PM_{10} emission factors based on the level of vehicle activity (i.e., vehicle kilometers traveled or VKT) occurring on the site are as follows[3]:

- Topsoil removal: 5.7 kg/VKT for pan scrapers
- Earthmoving: 1.2 kg/VKT for pan scrapers
- Truck haulage: 2.8 kg/VKT for haul trucks

Pushing Operations

For pushing (bulldozer) operations, the AP-42[2] emission-factor equation for overburden removal at western surface coal mines can be used. Although this equation actually relates to particulate <15 μmA, it would be expected that the PM_{10} emissions from such operations would be generally comparable. The AP-42 dozer equation is as follows:

$$E_p = \frac{0.45(s)^{1.5}}{(M)^{1.4}} \quad (6)$$

where: E_p = PM_{10} emission rate, kg/h
s = silt content of surface material, % (default = 6.9%)
M = moisture content of surface material, % (default = 7.9%)

Mud/Dirt Carryout

Finally, the increase in emissions on paved roads due to mud/dirt carryout has been assessed based on surface loading measurements at eight sites.[4] Tables 2 and 3 provide these emission factors in terms of g/vehicle pass, representing PM_{10} emissions generated over and above the "background" for the paved road sampled. Table 2 expresses the emission factors according to the volume of traffic entering and leaving the site, whereas Table 3 expresses the same data according to type of construction. Either set of factors can be used to estimate the increase in emissions.

Contaminated Emissions

There are, at present, no emission factors that specifically address contaminated particulate matter from fugitive sources. The emission rate R_j of particulate contaminated with a compound j can be estimated as:

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AIR & WASTE MANAGEMENT
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URS Corporation CALCULATION SHEET **Calc. No.** 4

Signature: A. Tang Date: 04/03/2008 Checked: J. Carson Date: 04/03/2008
Project: Middletown Coke Company Project No.: 39400297.26000
Subject: Pollutant Emissions Calculations

Purpose
To estimate criteria pollutant emissions due to coal handling and crushing.

Basis

Total number of coal transfer points = 15 enclosed = 9 unc. = 6
Maximum annual coal charge = 912,500 tons wet coal/yr
Maximum daily coal charge = 2,500 tons wet coal/day

Assumptions
Control eff. for fully enclosed transfer points and wet suppression/wet material for PM, PM_{10} and $PM_{2.5}$ 95% (estimated from Ohio RACM Table 2.2.1-2)
Control eff. for fully enclosed coal crushing operations for PM, PM_{10} and $PM_{2.5}$ = 99% (estimated from AP-40 and Ohio RACM)

Calculation
Use emission factors for coal handling from AP-42, 5th edition, Table 13.2.4-1 Equation (1)

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

where:
k, particle size multiplier for PM = 0.74 (from AP-42, 5th edition)
k, particle size multiplier for PM_{10} = 0.35 (from AP-42, 5th edition)
k, particle size multiplier for $PM_{2.5}$ = 0.11 (from AP-42, 5th edition)
U, mean wind speed = 9.9 mph from Tanks 4.09 Meteorological database (Dayton, OH)
M, moisture content = 4.80 % (for coal - max for equation)

PM EF (lb/ton coal) = 1.69E-03 for Coal Handling
PM_{10} EF (lb/ton coal) = 7.99E-04 for Coal Handling
$PM_{2.5}$ EF (lb/ton coal) = 2.51E-04 for Coal Handling

Use emission factors for coal sizing from AP-40, Coal Processing Section, Table 1 (same as RACM)

PM EF (lb/ton coal) = 0.16 for Coal Crushing
PM_{10} EF (lb/ton coal) = 0.08 for Coal Crushing (PM_{10} assumed to be 50% of PM)
$PM_{2.5}$ EF (lb/ton coal) = 0.024 for Coal Crushing ($PM_{2.5}$ assumed to be 15% of PM)

PM Emissions estimation for Coal Handling

No. points	Throughput	Efficiency	Emissions	
			ton/yr	lbs/hr
9	100%	95%	0.3469	0.079
6	100%	0%	4.6249	1.056
Total			4.972	1.135

PM Emissions estimation for Coal Crushing

No. points	Efficiency	Emissions	
		ton/yr	lbs/hr
1	99%	0.730	0.167
Total		0.730	0.167

PM_{10} Emissions estimation for Coal Handling

No. points	Throughput	Efficiency	Emissions	
			ton/yr	lbs/hr
9	100%	95%	0.1641	0.037
6	100%	0%	2.1875	0.499
Total			2.352	0.537

PM_{10} Emissions estimation for Coal Crushing

No. points	Efficiency	Emissions	
		ton/yr	lbs/hr
1	99%	0.365	0.083
Total		0.365	0.083

$PM_{2.5}$ Emissions estimation for Coal Handling

No. points	Throughput	Efficiency	Emissions	
			ton/yr	lbs/hr
9	100%	95%	0.0516	0.012
6	100%	0%	0.6875	0.157
Total			0.739	0.169

$PM_{2.5}$ Emissions estimation for Coal Crushing

No. points	Efficiency	Emissions	
		ton/yr	lbs/hr
1	99%	0.110	0.025
Total		0.110	0.025

URS Corporation CALCULATION SHEET **Calc. No.** 4

Signature: A. Tang Date: 04/03/2008 Checked: J. Carson Date: 04/03/2008
Project: Middletown Coke Company Project No.: 39400297.26000
Subject: Pollutant Emissions Calculations

Maximum Emissions for points with 100% of coal throughput - Coal Handling

Enclosed Transfer points

PM (lb/hr) = PM EF (lb/ton) * (tons/day) * (day/24 hours) * (1 - control efficiency/100) =	0.0088	lb PM/hr
PM (ton/yr) = PM EF (lb/ton) * (tons/yr) * (ton/2000 lb) * (1- control efficiency/100) =	0.0385	TPY PM
PM_{10} (lb/hr) = PM_{10} EF (lb/ton) * (tons/day) * (day/24 hours) * (1 - control efficiency/100) =	0.0042	lb PM_{10}/hr
PM_{10} (ton/yr) = PM_{10} EF (lb/ton) * (tons/yr) * (ton/2000 lb) * (1- control efficiency/100) =	0.0182	TPY PM_{10}
$PM_{2.5}$ (lb/hr) = $PM_{2.5}$ EF (lb/ton) * (tons/day) * (day/24 hours) * (1 - control efficiency/100) =	0.0013	lb $PM_{2.5}$/hr
$PM_{2.5}$ (ton/yr) = $PM_{2.5}$ EF (lb/ton) * (tons/yr) * (ton/2000 lb) * (1- control efficiency/100) =	0.0057	TPY $PM_{2.5}$

Maximum Emissions for Coal Crushing

TSP (lb/hr) = TSP EF (lb/ton) * (tons/day) * (day/24 hours) * (1 - control efficiency/100) =	0.167	lb PM/hr
TSP (tons/yr) = TSP EF (lb/ton) * (tons/yr) * (ton/2000 lb) * (1 - control efficiency/100) =	0.73	TPY PM
PM_{10} (lb/hr) = PM_{10} EF (lb/ton) * (tons/day) * (day/24 hours) * (1 - control efficiency/100) =	0.083	lb PM_{10}/hr
PM_{10} (tons/yr) = PM_{10} EF (lb/ton) * (tons/yr) * (ton/2000 lb) * (1 - control efficiency/100) =	0.365	TPY PM_{10}
$PM_{2.5}$ (lb/hr) = $PM_{2.5}$ EF (lb/ton) * (tons/day) * (day/24 hours) * (1 - control efficiency/100) =	0.025	lb $PM_{2.5}$/hr
$PM_{2.5}$ (tons/yr) = $PM_{2.5}$ EF (lb/ton) * (tons/yr) * (ton/2000 lb) * (1 - control efficiency/100) =	0.110	TPY $PM_{2.5}$

URS Corporation CALCULATION SHEET **Calc. No.** **9**

Signature: A. Tang Date: 04/03/2008 Checked: J. Carson Date: 04/03/2008
Project: Middletown Coke Company Project No.: 39400297.26000
Subject: Pollutant Emissions Calculations

Purpose
To estimate criteria pollutant emissions due to coke screening. The emissions are controlled by a baghouse and are emitted through the baghouse exhaust stack.

Basis

Maximum annual coal charge (requested limit) =	912,500	tons coal/yr
=	654,449	tons coke/yr
Operating hours =	8760	hrs/yr (24 hrs/day, 365 days/yr)
PM Grain loading =	0.008	gr/dscf
PM_{10} grain loading =	0.008	gr/dscf
$PM_{2.5}$ grain loading =	0.008	gr/dscf
Airflow =	50,000	scfm

Potential emissions estimation:

PM (tons/yr) = (grain loading grains/dscf) * (lb/7,000 gr) * (ton/2000 lb) * (airflow scfm) * (60 min/hr) * (operating hrs/yr)
= (0.008 gr/dscf) * (1 lb/7000 gr) * (ton/2000 lb) * (45,000 scfm) * (60 min/hr) * (hr/yr)
= 15.02 tons PM/yr

PM_{10} (tons/yr) = (grain loading grains/dscf) * (lb/7,000 gr) * (ton/2000 lb) * (airflow scfm) * (60 min/hr) * (operating hrs/yr)
= (0.008 gr/dscf) * (1 lb/7000 gr) * (ton/2000 lb) * (45,000 scfm) * (60 min/hr) * (hr/yr)
= 15.02 tons PM_{10}/yr

$PM_{2.5}$ (tons/yr) = (grain loading grains/dscf) * (lb/7,000 gr) * (ton/2000 lb) * (airflow scfm) * (60 min/hr) * (operating hrs/yr)
= (0.008 gr/dscf) * (1 lb/7000 gr) * (ton/2000 lb) * (45,000 scfm) * (60 min/hr) * (hr/yr)
= 15.02 tons $PM_{2.5}$/yr

Maximum Hourly Emissions:

PM (lb/hr) = (grain loading grains/dscf) * (lb/7,000 gr) * (airflow scfm) * (60 min/hr)
= 3.43 lb PM/hr

PM_{10} (lb/hr) = (grain loading grains/dscf) * (lb/7,000 gr) * (airflow scfm) * (60 min/hr)
= 3.43 lb PM_{10}/hr

$PM_{2.5}$ (lb/hr) = (grain loading grains/dscf) * (lb/7,000 gr) * (airflow scfm) * (60 min/hr)
= 3.43 lb $PM_{2.5}$/hr

Total Emissions from Coke Handling, Screening & Processing (F004):

PM

Coke Screening =	15.02	tons PM/yr	
Total Breeze Loadout =	0.02	tons PM/yr	(from Calculation No.11)
Total Coke Handling =	5.00	tons PM/yr	(from Calculation No.12)
Total Coke Handling, Screening & Processing =	20.04	tons PM/yr	

PM_{10}

Coke Screening =	15.02	tons PM_{10}/yr	
Total Breeze Loadout =	0.01	tons PM_{10}/yr	(from Calculation No.11)
Total Coke Handling =	2.36	tons PM_{10}/yr	(from Calculation No.12)
Total Coke Handling, Screening & Processing =	17.39	tons PM_{10}/yr	

$PM_{2.5}$

Coke Screening =	15.02	tons $PM_{2.5}$/yr	
Total Breeze Loadout =	0.003	tons $PM_{2.5}$/yr	(from Calculation No.11)
Total Coke Handling =	0.74	tons $PM_{2.5}$/yr	(from Calculation No.12)
Total Coke Handling, Screening & Processing =	15.76	tons $PM_{2.5}$/yr	

URS Corporation CALCULATION SHEET **Calc. No.** **10**

Signature: A. Tang Date: 04/03/2008 Checked: J. Carson Date: 04/03/2008
Project: Middletown Coke Company Project No.: 39400297.26000
Subject: Pollutant Emissions Calculations

Purpose
To estimate criteria pollutant emissions from 1 run of oven coke storage pile.
(Includes coke load-in, fugitives from the pile itself, and coke loadout.)
Emissions for each are broken down by part.

Note: This is an emergency coke stockpile and coke ground storage. However emissions are calculated as thought the pile is used 365 days/year.

Basis
Run of plant coke storage = 1.5 acres total

Part I. Coke Load-In

Purpose
To estimate criteria pollutant emissions due to coke loading into run of oven coke storage pile

Basis

Total number of coke transfer points =		1	
Maximum annual coal charge =		912,500	tons wet coal/yr
	=	654,449	tons wet coke/yr
Maximum daily coke produced =		1,793	tons wet coke/day

Assumptions
Assume 1 load-in transfer point.

Calculation
Use emission factors for coal handling from AP-42, 5th edition, p.13.2.4-1 Equation (1)

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

where:

k, particle size multiplier for PM =	0.74	(from AP-42, 5th edition)
k, particle size multiplier for PM_{10} =	0.35	(from AP-42, 5th edition)
k, particle size multiplier for $PM_{2.5}$ =	0.11	(from AP-42, 5th edition)
U, mean wind speed =	9.9	mph from Tanks 4.09 Meteorological database (Dayton, OH)
M, moisture content =	4.8	%

PM EF (lb/ton coke) =	1.69E-03	for coke load-in
PM_{10} EF (lb/ton coke) =	7.99E-04	for coke load-in
$PM_{2.5}$ EF (lb/ton coke) =	2.51E-04	for coke load-in

Potential emissions estimation:

PM (tons/yr) = PM EF * # transfer points * tons coke transferred
= (0.00169 lb/ton coke) * [(1 transfer points) * (tons coke handled/transfer point)] * (ton/2000 lb)
= 0.5528 tons PM/yr

PM_{10} (tons/yr) = PM_{10} EF * # transfer points * tons coke transferred
= (0.00080. lb/ton coke) * [(1 transfer points) * (tons coke handled/transfer point)] * (ton/2000 lb)
= 0.2615 tons PM_{10}/yr

$PM_{2.5}$ (tons/yr) = $PM_{2.5}$ EF * # transfer points * tons coke transferred
= (0.00025 lb/ton coke) * [(1 transfer points) * (tons coke handled/transfer point)] * (ton/2000 lb)
= 0.0822 tons $PM_{2.5}$/yr

Maximum Hourly emissions:

PM (lb/hr) = PM EF * # transfer points * max daily tons coke transferred * (day/24 hours)
= 0.1262 lb PM/hr

PM_{10} (lb/hr) = PM_{10} EF * # transfer points * max daily tons coke transferred * (day/24 hours)
= 0.0597 lb PM_{10}/hr

$PM_{2.5}$ (lb/hr) = $PM_{2.5}$ EF * # transfer points * max daily tons coke transferred * (day/24 hours)
= 0.0188 lb $PM_{2.5}$/hr

URS Corporation CALCULATION SHEET **Calc. No.** **10**

Signature: A. Tang Date: 04/03/2008 Checked: J. Carson Date: 04/03/2008
Project: Middletown Coke Company Project No.: 39400297.26000
Subject: Pollutant Emissions Calculations

Part II. Coke Pile

Purpose
To estimate emissions due to working in the run of oven coke storage pile.

Assumptions
Number days pile worked in = 365 days

Calculation
Use emission factors for storage pile fugitive emissions from AP-40, Section 4, Fugitive Emissions, p. 136, Equation (5)

EF (lb/day/acre) = k * 1.7 * (s/1.5) * ((365-p)/235) * (f/15)

where:

k, particle size multiplier for PM =	1	
k, particle size multiplier for PM_{10} =	0.5	
k, particle size multiplier for $PM_{2.5}$ =	0.2	
s, silt content for coke =	1	%
f, percentage of time that the unobstructed wind speed exceed≥5.4 m/s at mean pile height =	29	%
p, number of days with≥0.01 inch of precipitation per year = (for Middletown, Ohio from AP-42, 5th edition, Figure 13.2.2-1)	130	days

PM EF (lb/day/acre) =	2.19	for coke pile
PM_{10} EF (lb/day/acre) =	1.10	for coke pile
$PM_{2.5}$ EF (lb/day/acre) =	0.44	for coke pile

Potential emissions estimation:

PM (tons/yr) = PM EF * Acres of pile * days pile worked in
= (2.19 lb/day/acre) * (acres) * (365 days/yr) * (ton/2000 lb)
= 0.5998 tons PM/yr

PM_{10} (tons/yr) = PM_{10} EF * Acres of pile * days pile worked in
= (1.10 lb/day/acre) * (acres) * (365 days/yr) * (ton/2000 lb)
= 0.2999 tons PM_{10}/yr

$PM_{2.5}$ (tons/yr) = $PM_{2.5}$ EF * Acres of pile * days pile worked in
= (0.44 lb/day/acre) * (acres) * (365 days/yr) * (ton/2000 lb)
= 0.1200 tons $PM_{2.5}$/yr

Hourly emissions
PM (lb/hr) = (tons/yr) * (2000 lb/ton) * (yr/8760 hrs)
= 0.1369 lb PM/hr

PM_{10} (lb/hr) = (tons/yr) * (2000 lb/ton) * (yr/8760 hrs)
= 0.0685 lb PM_{10}/hr

$PM_{2.5}$ (lb/hr) = (tons/yr) * (2000 lb/ton) * (yr/8760 hrs)
= 0.0274 lb $PM_{2.5}$/hr

URS Corporation CALCULATION SHEET **Calc. No.** **10**

Signature: A. Tang Date: 04/03/2008 Checked: J. Carson Date: 04/03/2008
Project: Middletown Coke Company Project No.: 39400297.26000
Subject: Pollutant Emissions Calculations

Part III. Coke Loadout from pile.

Purpose
To estimate criteria pollutant emissions due to coke loadout from run of oven coke storage pile.

Basis

Total number of coke transfer points =		1	
Maximum annual coal charge =		912,500	tons wet coal/yr
	=	654,449	tons wet coke/yr
Maximum daily coke produced =		1,793	tons wet coke/day

Assumptions
Assume 1 loadout transfer point

Calculation
Use emission factors for coal handling from AP-42, 5th edition, p.13.2.4-1 Equation (1)

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

where:

k, particle size multiplier for PM =	0.74	(from AP-42, 5th edition)
k, particle size multiplier for PM_{10} =	0.35	(from AP-42, 5th edition)
k, particle size multiplier for $PM_{2.5}$ =	0.11	(from AP-42, 5th edition)
U, mean wind speed =	9.9	mph from Tanks 4.09 Meteorological database (Dayton, OH)
M, moisture content =	4.8	%

PM EF (lb/ton coke) =	1.69E-03	for coke load-out
PM_{10} EF (lb/ton coke) =	7.99E-04	for coke load-out
$PM_{2.5}$ EF (lb/ton coke) =	2.51E-04	for coke load-out

Potential emissions estimation:

PM (tons/yr) = PM EF * # transfer points * tons coke transferred
= (EF lb/ton coke) * [(# transfer points) * (tons coke handled/transfer point)] * (ton/2000 lb)
= 0.553 tons PM/yr

PM_{10} (tons/yr) = PM_{10} EF * # transfer points * tons coke transferred
= (EF lb/ton coke) * [(# transfer points) * (tons coke handled/transfer point)] * (ton/2000 lb)
= 0.261 tons PM_{10}/yr

$PM_{2.5}$ (tons/yr) = $PM_{2.5}$ EF * # transfer points * tons coke transferred
= (EF lb/ton coke) * [(# transfer points) * (tons coke handled/transfer point)] * (ton/2000 lb)
= 0.082 tons $PM_{2.5}$/yr

Maximum Hourly emissions:

PM (lb/hr) = PM EF * # transfer points * max daily tons coke transferred * (day/24 hours)
= 0.126 lb PM/hr

PM_{10} (lb/hr) = PM_{10} EF * # transfer points * max daily tons coke transferred * (day/24 hours)
= 0.060 lb PM_{10}/hr

$PM_{2.5}$ (lb/hr) = $PM_{2.5}$ EF * # transfer points * max daily tons coke transferred * (day/24 hours)
= 0.019 lb $PM_{2.5}$/hr

Part IV - Total Emissions from Coke Loadin, Coke Pile, and Coke Loadout from Pile:

Annual Emissions:

PM (tons/yr) =	1.71	tons PM/yr
PM_{10} (tons/yr) =	0.82	tons PM_{10}/yr
$PM_{2.5}$ (tons/yr) =	0.28	tons $PM_{2.5}$/yr

Maximum Hourly Emissions:

PM (lb/hr) =	0.39	lb/hr per run of plant coke pile
PM_{10} (lb/hr) =	0.19	lb/hr per run of plant coke pile
$PM_{2.5}$ (lb/hr) =	0.06	lb/hr per run of plant coke pile

URS Corporation CALCULATION SHEET **Calc. No.** **12**

Signature: A. Tang Date: 04/03/2008 Checked: J. Carson Date: 04/03/2008
Project: Middletown Coke Company Project No.: 39400297.26000
Subject: Pollutant Emissions Calculations

Purpose
To estimate criteria pollutant emissions due to coke handling transfer.

Basis

Total number of coke transfer points =		22	
Number of enclosed transfer points =		18	
Maximum annual coal charge (requested limit) =		912,500	tons wet coal/yr
	=	654,449	tons wet coke/yr
Maximum daily coke produced =		1,793	tons wet coke/day

Assumptions
Assume each transfer point handles the maximum annual coke produced based on the maximum annual coal charge rate.

Control efficiency for enclosed points = 70% (based on Ohio RACM Table 2.2.1-2)

Calculation
Use emission factors for coal handling from AP-42, 5th edition, p.13.2.4-1 Equation (1)

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

where:

k, particle size multiplier for PM =	0.74	(from AP-42, 5th edition)
k, particle size multiplier for PM_{10} =	0.35	(from AP-42, 5th edition)
k, particle size multiplier for $PM_{2.5}$ =	0.11	(from AP-42, 5th edition)
U, mean wind speed =	9.9	mph from Tanks 4.09 Meteorological database (Dayton, OH)
M, moisture content =	4.8	%

PM EF (lb/ton coke) =	1.69E-03
PM_{10} EF (lb/ton coke) =	7.99E-04
$PM_{2.5}$ EF (lb/ton coke) =	2.51E-04

PM Emissions

No. points	Throughput	Efficiency	Emissions	
			lbs/hr	tons/yr
14	100%	70%	0.530	2.322
2	120%	70%	0.091	0.398
2	20%	70%	0.015	0.066
4	100%	0%	0.505	2.211
Total			1.141	4.998

Uncontrolled PM Emissions

No. points	Throughput	Efficiency	Emissions
			lbs/hr
14	100%	0%	1.767
2	120%	0%	0.303
2	20%	0%	0.050
4	100%	0%	0.505
Total			2.625

PM_{10} Emissions

No. points	Throuput	Efficiency	Emissions	
			lbs/hr	tons/yr
14	100%	70%	0.251	1.098
2	120%	70%	0.043	0.188
2	20%	70%	0.0072	0.031
4	100%	0%	0.239	1.046
Total			0.540	2.364

Uncontrolled PM_{10} Emissions

No. points	Throuput	Efficiency	Emissions
			lbs/hr
14	100%	0%	0.836
2	120%	0%	0.143
2	20%	0%	0.0239
4	100%	0%	0.239
Total			1.242

$PM_{2.5}$ Emissions

No. points	Throuput	Efficiency	Emissions	
			lbs/hr	tons/yr
14	100%	70%	0.079	0.345
2	120%	70%	0.014	0.059
2	20%	70%	0.002	0.010
4	100%	0%	0.075	0.329
Total			0.170	0.743

Uncontrolled $PM_{2.5}$ Emissions

No. points	Throuput	Efficiency	Emissions
			lbs/hr
14	100%	0%	0.263
2	120%	0%	0.045
2	20%	0%	0.008
4	100%	0%	0.075
Total			0.390

URS Corporation CALCULATION SHEET **Calc. No.** **12**

Signature: A. Tang Date: 04/03/2008 Checked: J. Carson Date: 04/03/2008
Project: Middletown Coke Company Project No.: 39400297.26000
Subject: Pollutant Emissions Calculations

Maximum Emissions for points with 100% of coke throughput

Enclosed Transfer points

PM (lb/hr) = PM EF (lb/ton) * (tons/day) * (day/24 hours) * (1 - control efficiency/100) =	0.0379 lb PM/hr
PM (ton/yr) = PM EF (lb/ton) * (tons/yr) * (ton/2000 lb) * (1- control efficiency/100) =	0.1659 TPY PM
PM_{10} (lb/hr) = PM_{10} EF (lb/ton) * (tons/day) * (day/24 hours) * (1 - control efficiency/100) =	0.0179 lb PM_{10}/hr
PM_{10} (ton/yr) = PM_{10} EF (lb/ton) * (tons/yr) * (ton/2000 lb) * (1- control efficiency/100) =	0.0784 TPY PM_{10}
$PM_{2.5}$ (lb/hr) = $PM_{2.5}$ EF (lb/ton) * (tons/day) * (day/24 hours) * (1 - control efficiency/100) =	0.0056 lb $PM_{2.5}$/hr
$PM_{2.5}$ (ton/yr) = $PM_{2.5}$ EF (lb/ton) * (tons/yr) * (ton/2000 lb) * (1- control efficiency/100) =	0.0247 TPY $PM_{2.5}$

Uncontrolled Transfer points

PM (lb/hr) = PM EF (lb/ton) * (tons/day) * (day/24 hours) =	0.1262 lb PM/hr
PM (ton/yr) = PM EF (lb/ton) * (tons/yr) * (ton/2000 lb) =	0.5528 TPY PM
PM_{10} (lb/hr) = PM_{10} EF (lb/ton) * (tons/day) * (day/24 hours) =	0.0597 lb PM_{10}/hr
PM_{10} (ton/yr) = PM_{10} EF (lb/ton) * (tons/yr) * (ton/2000 lb) =	0.2615 TPY PM_{10}
$PM_{2.5}$ (lb/hr) = $PM_{2.5}$ EF (lb/ton) * (tons/day) * (day/24 hours) =	0.0188 lb $PM_{2.5}$/hr
$PM_{2.5}$ (ton/yr) = $PM_{2.5}$ EF (lb/ton) * (tons/yr) * (ton/2000 lb) =	0.0822 TPY $PM_{2.5}$

URS Corporation CALCULATION SHEET **Calc. No.** **16**

Signature: A. Tang Date: 04/03/2008 Checked: J. Carson Date: 04/03/2008
Project: Middletown Coke Company Project No.: 39400297.26000
Subject: Pollutant Emissions Calculations

Purpose
To estimate criteria pollutant emissions from 1 emergency coke breeze storage pile.
(Includes coke breeze load-in, fugitives from the pile itself, and coke breeze loadout.)
Emissions for each are broken down by part.

Note: This is an emergency coke breeze pile
Assume use = 365 days/year

Basis
Coke Breeze storage = 0.2 acres total

Part I. Emergency Coke Breeze Load-In

Purpose
To estimate criteria pollutant emissions due to emergency coke breeze loading into coke breeze storage pile

Basis
Total number of coke transfer points = 1
Coke breeze = 40,621 tons wet breeze/yr (total for 365 days)
111 tons wet breeze/day

Assumptions
Assume 1 load-in transfer point.

Calculation
Use emission factors for coal handling from AP-42, 5th edition, p.13.2.4-1 Equation (1)

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

where:
k, particle size multiplier for PM = 0.74 (from AP-42, 5th edition)
k, particle size multiplier for PM_{10} = 0.35 (from AP-42, 5th edition)
k, particle size multiplier for $PM_{2.5}$ = 0.11 (from AP-42, 5th edition)
U, mean wind speed = 9.9 mph from Tanks 4.09 Meteorological database (Dayton, OH)
M, moisture content = 4.8 %

PM EF (lb/ton coke) = 1.69E-03 for emergency coke breeze load-in
PM_{10} EF (lb/ton coke) = 7.99E-04 for emergency coke breeze load-in
$PM_{2.5}$ EF (lb/ton coke) = 2.51E-04 for emergency coke breeze load-in

Potential emissions estimation:

PM (tons/yr) = PM EF * # transfer points * tons coke transferred * max daily tons coke transferred * day/24 hours * 8760 hrs/year * ton/2000 lb
= 0.0343 tons PM/yr

PM_{10} (tons/yr) = PM_{10} EF * # transfer points * tons coke transferred * max daily tons coke transferred * day/24 hours * 8760 hrs/year * ton/2000 lb
= 0.0162 tons PM_{10}/yr

$PM_{2.5}$ (tons/yr) = $PM_{2.5}$ EF * # transfer points * tons coke transferred * max daily tons coke transferred * day/24 hours * 8760 hrs/year * ton/2000 lb
= 0.0051 tons $PM_{2.5}$/yr

Maximum Hourly emissions:

PM (lb/hr) = PM EF * # transfer points * max daily tons coke transferred * (day/24 hours)
= 0.0078 lb PM/hr

PM_{10} (lb/hr) = PM_{10} EF * # transfer points * max daily tons coke transferred * (day/24 hours)
= 0.0037 lb PM_{10}/hr

$PM_{2.5}$ (lb/hr) = $PM_{2.5}$ EF * # transfer points * max daily tons coke transferred * (day/24 hours)
= 0.0012 lb $PM_{2.5}$/hr

URS Corporation CALCULATION SHEET **Calc. No.** **16**

Signature: A. Tang Date: 04/03/2008 Checked: J. Carson Date: 04/03/2008
Project: Middletown Coke Company Project No.: 39400297.26000
Subject: Pollutant Emissions Calculations

Part II. Emergency Coke Breeze Pile

Purpose
To estimate emissions due to working in the emergency coke breeze storage pile.

Assumptions

Number days pile worked in = 365 days

Calculation
Use emission factors for storage pile fugitive emissions from AP-40, Section 4, Fugitive Emissions, p. 136, Equation (5)

EF (lb/day/acre) = k * 1.7 * (s/1.5) * ((365-p)/235) * (f/15)

where:

k, particle size multiplier for PM =	1
k, particle size multiplier for PM_{10} =	0.5
k, particle size multiplier for $PM_{2.5}$ =	0.2
s, silt content for coke breeze=	4.9 %
f, percentage of time that the unobstructed wind speed exceed≥5.4 m/s at mean pile height =	29 %
p, number of days with≥0.01 inch of precipitation per year = (for Middletown, Ohio from AP-42, 5th edition, Figure 13.2.2-1)	130 days

PM EF (lb/day/acre) = 10.74 for emergency coke breeze pile
PM_{10} EF (lb/day/acre) = 5.37 for emergency coke breeze pile
$PM_{2.5}$ EF (lb/day/acre) = 2.15 for emergency coke breeze pile

Potential emissions estimation:

PM (tons/yr) = PM EF * Acres of pile * days pile worked in
= (10.74 lb/day/acre) * (acres) * (365 days/yr) * (ton/2000 lb)
= 0.3919 tons PM/yr

PM_{10} (tons/yr) = PM_{10} EF * Acres of pile * days pile worked in
= (5.37 lb/day/acre) * (acres) * (365 days/yr) * (ton/2000 lb)
= 0.1959 tons PM_{10}/yr

$PM_{2.5}$ (tons/yr) = $PM_{2.5}$ EF * Acres of pile * days pile worked in
= (2.15 lb/day/acre) * (acres) * (365 days/yr) * (ton/2000 lb)
= 0.0784 tons $PM_{2.5}$/yr

Hourly emissions
PM (lb/hr) = (tons/yr) * (2000 lb/ton) * (yr/8760 hrs)
= 0.0895 lb PM/hr

PM_{10} (lb/hr) = (tons/yr) * (2000 lb/ton) * (yr/8760 hrs)
= 0.0447 lb PM_{10}/hr

$PM_{2.5}$ (lb/hr) = (tons/yr) * (2000 lb/ton) * (yr/8760 hrs)
= 0.0179 lb $PM_{2.5}$/hr

URS Corporation CALCULATION SHEET **Calc. No.** **16**

Signature: A. Tang Date: 04/03/2008 Checked: J. Carson Date: 04/03/2008
Project: Middletown Coke Company Project No.: 39400297.26000
Subject: Pollutant Emissions Calculations

Part III. Emergency Coke Breeze Loadout from pile.

Purpose
To estimate criteria pollutant emissions due to coke breeze loadout from emergency coke breeze storage pile.

Basis

Total number of coke transfer points =		1		
Coke Breeze	=	40,621	tons wet breeze/yr	(total for 365 days)
		111	tons wet breeze/day	

Assumptions
Assume 1 loadout transfer point

Calculation
Use emission factors for coal handling from AP-42, 5th edition, p.13.2.4-1 Equation (1)

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

where:

k, particle size multiplier for PM =	0.74	(from AP-42, 5th edition)
k, particle size multiplier for PM_{10} =	0.35	(from AP-42, 5th edition)
k, particle size multiplier for $PM_{2.5}$ =	0.11	(from AP-42, 5th edition)
U, mean wind speed =	9.9	mph from Tanks 4.09 Meteorological database (Dayton, OH)
M, moisture content =	4.8	%

PM EF (lb/ton coke) =	1.69E-03	for emergency coke breeze load-out
PM_{10} EF (lb/ton coke) =	7.99E-04	for emergency coke breeze load-out
$PM_{2.5}$ EF (lb/ton coke) =	2.51E-04	for emergency coke breeze load-out

Potential emissions estimation:

PM (tons/yr) = PM EF * # transfer points * tons coke transferred * max daily tons coke transferred * day/24 hours * 8760 hrs/year * ton/2000 lb
= (EF lb/ton coke) * [(# transfer points) * (tons coke handled/transfer point)] * (ton/2000 lb)
= 0.0343 tons PM/yr

PM_{10} (tons/yr) = PM_{10} EF * # transfer points * tons coke transferred * max daily tons coke transferred * day/24 hours * 8760 hrs/year * ton/2000 lb
= (EF lb/ton coke) * [(# transfer points) * (tons coke handled/transfer point)] * (ton/2000 lb)
= 0.0162 tons PM_{10}/yr

$PM_{2.5}$ (tons/yr) = $PM_{2.5}$ EF * # transfer points * tons coke transferred * max daily tons coke transferred * day/24 hours * 8760 hrs/year * ton/2000 lb
= (EF lb/ton coke) * [(# transfer points) * (tons coke handled/transfer point)] * (ton/2000 lb)
= 0.0051 tons $PM_{2.5}$/yr

Maximum Hourly emissions:

PM (lb/hr) = PM EF * # transfer points * max daily tons coke transferred * (day/24 hours)
= 0.008 lb PM/hr

PM_{10} (lb/hr) = PM_{10} EF * # transfer points * max daily tons coke transferred * (day/24 hours)
= 0.004 lb PM_{10}/hr

$PM_{2.5}$ (lb/hr) = $PM_{2.5}$ EF * # transfer points * max daily tons coke transferred * (day/24 hours)
= 0.001 lb $PM_{2.5}$/hr

Part IV - Total Emissions from Loadin, Pile, and Loadout from Emergency Coke Breeze Pile:

Annual Emissions:

PM (tons/yr) =	0.46	tons PM/yr
PM_{10} (tons/yr) =	0.23	tons PM_{10}/yr
$PM_{2.5}$ (tons/yr) =	0.09	tons $PM_{2.5}$/yr

Maximum Hourly Emissions:

PM (lb/hr) =	0.11	lb/hr
PM_{10} (lb/hr) =	0.05	lb/hr
$PM_{2.5}$ (lb/hr) =	0.02	lb/hr

URS Corporation CALCULATION SHEET **Calc. No.** **17**

Signature: A. Tang Date: 04/03/2008 Checked: J. Carson Date: 04/03/2008
Project: Middletown Coke Company Project No.: 39400297.26000
Subject: Pollutant Emissions Calculations

Purpose
To estimate criteria pollutant emissions from 1 emergency screened coke storage pile.
(Includes coke load-in, fugitives from the pile itself, and coke loadout.)
Emissions for each are broken down by part.

Note: This is an emergency screened coke ground storage

Basis
Emergency screened coke storage = 0.3 acres total
Assume use = 365 days/year

Part I. Emergency Screened Coke Load-In

Purpose
To estimate criteria pollutant emissions due to coke loading into coke storage pile

Basis

Total number of coke transfer points =	1		
Maximum annual coal charge =	912,500	tons wet coal/yr	(total for 365 days)
Maximum furnace coke =	613,828	tons wet coke/yr	(total for 365 days)
Maximum daily coke produced =	1,682	tons wet coke/day	

Assumptions
Assume 1 load-in transfer point.

Calculation
Use emission factors for coal handling from AP-42, 5th edition, p.13.2.4-1 Equation (1)

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

where:

k, particle size multiplier for PM =	0.74	(from AP-42, 5th edition)
k, particle size multiplier for PM_{10} =	0.35	(from AP-42, 5th edition)
k, particle size multiplier for $PM_{2.5}$ =	0.11	(from AP-42, 5th edition)
U, mean wind speed =	9.9	mph from Tanks 4.09 Meteorological database (Dayton, OH)
M, moisture content =	4.8	%

PM EF (lb/ton coke) =	1.69E-03	for coke load-in
PM_{10} EF (lb/ton coke) =	7.99E-04	for coke load-in
$PM_{2.5}$ EF (lb/ton coke) =	2.51E-04	for coke load-in

Potential emissions estimation:

PM (tons/yr) = PM EF * # transfer points * tons coke transferred * max daily tons coke transferred * day/24 hours * 8760 hrs/year * ton/2000 lb
= 0.5185 tons PM/yr

PM_{10} (tons/yr) = PM_{10} EF * # transfer points * tons coke transferred * max daily tons coke transferred * day/24 hours * 8760 hrs/year * ton/2000 lb
= 0.2452 tons PM_{10}/yr

$PM_{2.5}$ (tons/yr) = $PM_{2.5}$ EF * # transfer points * tons coke transferred * max daily tons coke transferred * day/24 hours * 8760 hrs/year * ton/2000 lb
= 0.0771 tons $PM_{2.5}$/yr

Maximum Hourly emissions:

PM (lb/hr) = PM EF * # transfer points * max daily tons coke transferred * (day/24 hours)
= 0.1184 lb PM/hr

PM_{10} (lb/hr) = PM_{10} EF * # transfer points * max daily tons coke transferred * (day/24 hours)
= 0.0560 lb PM_{10}/hr

$PM_{2.5}$ (lb/hr) = $PM_{2.5}$ EF * # transfer points * max daily tons coke transferred * (day/24 hours)
= 0.0176 lb $PM_{2.5}$/hr

URS Corporation CALCULATION SHEET **Calc. No.** 17

Signature: A. Tang Date: 04/03/2008 Checked: J. Carson Date: 04/03/2008
Project: Middletown Coke Company Project No.: 39400297.26000
Subject: Pollutant Emissions Calculations

Part II. Emergency Screened Coke Pile

Purpose
To estimate emissions due to working in the emergency screened coke storage pile.

Assumptions
Number days pile worked in = 365 days

Calculation
Use emission factors for storage pile fugitive emissions from AP-40, Section 4, Fugitive Emissions, p. 136, Equation (5)

EF (lb/day/acre) = k * 1.7 * (s/1.5) * ((365-p)/235) * (f/15)

where:

k, particle size multiplier for PM =	1	
k, particle size multiplier for PM_{10} =	0.5	
k, particle size multiplier for $PM_{2.5}$ =	0.2	
s, silt content for coke =	1	%
f, percentage of time that the unobstructed wind speed exceed≥5.4 m/s at mean pile height =	29	%
p, number of days with≥0.01 inch of precipitation per year =	130	days

(for Middletown, Ohio from AP-42, 5th edition, Figure 13.2.2-1)

PM EF (lb/day/acre) =	2.19	for emergency screened coke pile
PM_{10} EF (lb/day/acre) =	1.10	for emergency screened coke pile
$PM_{2.5}$ EF (lb/day/acre) =	0.44	for emergency screened coke pile

Potential emissions estimation:

PM (tons/yr) = PM EF * Acres of pile * days pile worked in * ton/2000 lb
= (2.19 lb/day/acre) * (acres) * (365 days/yr) * (ton/2000 lb)
= 0.120 tons PM/yr

PM_{10} (tons/yr) = PM_{10} EF * Acres of pile * days pile worked in * ton/2000 lb
= (1.10 lb/day/acre) * (acres) * (365days/yr) * (ton/2000 lb)
= 0.060 tons PM_{10}/yr

$PM_{2.5}$ (tons/yr) = $PM_{2.5}$ EF * Acres of pile * days pile worked in * ton/2000 lb
= (0.44 lb/day/acre) * (acres) * (365 days/yr) * (ton/2000 lb)
= 0.024 tons $PM_{2.5}$/yr

Hourly emissions
PM (lb/hr) = (tons/yr) * (2000 lb/ton) * (yr/8760 hrs)
= 0.0274 lb PM/hr

PM_{10} (lb/hr) = (tons/yr) * (2000 lb/ton) * (yr/8760 hrs)
= 0.0137 lb PM_{10}/hr

$PM_{2.5}$ (lb/hr) = (tons/yr) * (2000 lb/ton) * (yr/8760 hrs)
= 0.0055 lb $PM_{2.5}$/hr

URS Corporation CALCULATION SHEET **Calc. No.** **17**

Signature: A. Tang Date: 04/03/2008 Checked: J. Carson Date: 04/03/2008
Project: Middletown Coke Company Project No.: 39400297.26000
Subject: Pollutant Emissions Calculations

Part III. Emergency Screened Coke Loadout from pile.

Purpose
To estimate criteria pollutant emissions due to coke loadout from screened coke storage pile.

Basis

Total number of coke transfer points =	1		
Maximum annual coal charge =	912,500	tons wet coal/yr	(total for 365 days)
Maximum annual furnace coke =	613,828	tons wet coke/yr	(total for 365 days)
Maximum daily coke produced =	1,682	tons wet coke/day	

Assumptions
Assume 1 loadout transfer point

Calculation
Use emission factors for coal handling from AP-42, 5th edition, p.13.2.4-1 Equation (1)

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

where:

k, particle size multiplier for PM =	0.74	(from AP-42, 5th edition)
k, particle size multiplier for PM_{10} =	0.35	(from AP-42, 5th edition)
k, particle size multiplier for $PM_{2.5}$ =	0.11	(from AP-42, 5th edition)
U, mean wind speed =	9.9	mph from Tanks 4.09 Meteorological database (Dayton, OH)
M, moisture content =	4.8	%

PM EF (lb/ton coke) =	1.69E-03	for coke load-out
PM_{10} EF (lb/ton coke) =	7.99E-04	for coke load-out
$PM_{2.5}$ EF (lb/ton coke) =	2.51E-04	for coke load-out

Potential emissions estimation:

PM (tons/yr) = PM EF * # transfer points * tons coke transferred * max daily tons coke transferred * day/24 hours * 8760 hrs/year * ton/2000 lb
= (EF lb/ton coke) * [(# transfer points) * (tons coke handled/transfer point)] * (ton/2000 lb)
= 0.519 tons PM/yr

PM_{10} (tons/yr) = PM_{10} EF * # transfer points * tons coke transferred * max daily tons coke transferred * day/24 hours * 8760 hrs/year * ton/2000 lb
= (EF lb/ton coke) * [(# transfer points) * (tons coke handled/transfer point)] * (ton/2000 lb)
= 0.245 tons PM_{10}/yr

$PM_{2.5}$ (tons/yr) = $PM_{2.5}$ EF * # transfer points * tons coke transferred * max daily tons coke transferred * day/24 hours * 8760 hrs/year * ton/2000 lb
= (EF lb/ton coke) * [(# transfer points) * (tons coke handled/transfer point)] * (ton/2000 lb)
= 0.077 tons $PM_{2.5}$/yr

Maximum Hourly emissions:

PM (lb/hr) = PM EF * # transfer points * max daily tons coke transferred * (day/24 hours)
= 0.118 lb PM/hr

PM_{10} (lb/hr) = PM_{10} EF * # transfer points * max daily tons coke transferred * (day/24 hours)
= 0.056 lb PM_{10}/hr

$PM_{2.5}$ (lb/hr) = $PM_{2.5}$ EF * # transfer points * max daily tons coke transferred * (day/24 hours)
= 0.018 lb $PM_{2.5}$/hr

Part IV - Total Emissions from Coke Loadin, Coke Pile, and Coke Loadout from Screened Coke Pile:

Annual Emissions:

PM (tons/yr) =	1.16	tons PM/yr
PM_{10} (tons/yr) =	0.55	tons PM_{10}/yr
$PM_{2.5}$ (tons/yr) =	0.18	tons $PM_{2.5}$/yr

Maximum Hourly Emissions:

PM (lb/hr) =	0.26	lb PM/hr
PM_{10} (lb/hr) =	0.13	lb PM_{10}/hr
$PM_{2.5}$ (lb/hr) =	0.04	lb $PM_{2.5}$/hr