BEFORE THE ILLINOIS POLLUTION CONTROL BOARD
OF THE STATE OF ILLINOIS

SUNCOKE ENERGY, INC. Lime Spray Dryer Absorber, Fabric Filter Baghouse Systems, Afterburner Tunnel System for Heat Recovery Steam Ovens, and Other Coal Handling Control Measures for Heat Recovery Coke Plant	)	PCB 14- (Tax Certification - Air)
PROPERTY/PARCEL IDENTIFICATION NUMBERS 22-2-20-1-00-000-004.002 or portion thereof	)	

NOTICE

TO: [*Electronic filing*]
John Therriault, Clerk
Illinois Pollution Control Board
State of Illinois Center
100 W. Randolph Street, Suite 11-500
Chicago, Illinois 60601

[*Service by mail*]
Richard F. Booker, Esquire
1735 Market Street, 15th Floor
Philadelphia, Pennsylvania 19103

[*Service by mail*]
Steve Santarelli
Illinois Department of Revenue
101 West Jefferson
P.O. Box 19033
Springfield, Illinois 62794

PLEASE TAKE NOTICE that I have today electronically filed with the Office of the Pollution Control Board the **APPEARANCE** and **RECOMMENDATION** of the Illinois Environmental Protection Agency, a paper copy of which is herewith served upon the applicant and a representative of the Illinois Department of Revenue.

Respectfully submitted by,

/s/ Robb H. Layman
Robb H. Layman
Assistant Counsel

Date: December 6, 2013

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
1021 North Grand Avenue East
P.O. Box 19276
Springfield, IL 62794-9276
Telephone: (217) 524-9137

BEFORE THE ILLINOIS POLLUTION CONTROL BOARD
OF THE STATE OF ILLINOIS

SUNCOKE ENERGY, INC. Lime Spray Dryer Absorber, Fabric Filter Baghouse Systems, Afterburner Tunnel System for Heat Recovery Steam Ovens, and Other Coal Handling Control Measures for Heat Recovery Coke Plant	)	PCB 14- (Tax Certification - Air)
PROPERTY/PARCEL IDENTIFICATION NUMBERS 22-2-20-1-00-000-004.002 or portion thereof	)	

APPEARANCE

I hereby file my Appearance in this proceeding on behalf of the Illinois Environmental Protection Agency.

Respectfully submitted by,

/s/ Robb H. Layman

Robb H. Layman
Assistant Counsel

Date: December 6, 2013

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
1021 North Grand Avenue East
P.O. Box 19276
Springfield, Illinois 62794-9276
Telephone: (217) 524-9137

BEFORE THE ILLINOIS POLLUTION CONTROL BOARD
OF THE STATE OF ILLINOIS

SUNCOKE ENERGY, INC. Lime Spray Dryer Absorber, Fabric Filter Baghouse System and Afterburner Tunnel System for Heat Recovery Steam Ovens, and Other Miscellaneous Coal Handling Control Measures for Heat Recovery Coke Plant	)	PCB 14- (Tax Certification - Air)
PROPERTY/PARCEL IDENTIFICATION NUMBERS 22-2-20-1-00-000-004.002 or portion thereof	)	

RECOMMENDATION

NOW COMES the ILLINOIS ENVIRONMENTAL PROTECTION AGENCY ("Illinois EPA"), through its attorneys, and pursuant to 35 Ill. Adm. Code 125.204 of the ILLINOIS POLLUTION CONTROL BOARD'S ("Board") procedural regulations, files the Illinois EPA's Recommendation in the above-referenced request for tax certification of pollution control facilities. The Illinois EPA recommends **issuance** of a tax certification covering the subject matters specifically identified herein. In support thereof, the Illinois EPA states as follows:

1. On or about December 28, 2009, the Illinois EPA received an application and supporting information from SUNCOKE ENERGY, INC., ("Suncoke Energy") concerning the proposed tax certification of certain air emission sources and/or equipment located at its Granite City coal heat recovery plant in Madison County, Illinois. A copy of the application is attached hereto. **[Exhibit A]**. On or about October 18, 2010, the Illinois EPA received an amended application for the same air emission sources and/or equipment. A copy of the application is also attached hereto. [**Exhibit B**].

2. The applicant's business address for purposes of this matter is as follows:

SunCoke Energy
Richard F. Booker, Esquire
1735 Market Street, 15th Floor
Philadelphia, Pennsylvania 19103

3. The facility address is as follows:

SunCoke Energy
State Route 203, Edwardsville Road
Granite City, Illinois

4. The subject matter of the application describes numerous emission control systems and/or devices that were constructed and installed by SunCoke Energy at its new Heat Recovery Coke Plant in Granite City, Illinois. As described in the application, the construction of the new plant entailed several systems and/or devices that are widely recognized as conventional emissions control equipment. Among these include the Lime Spray Dryer Absorber and Fabric Filter Baghouse systems, which remove particulate matter and sulfur dioxide emissions from the oven waste gases that operate downstream of the Heat Recovery Steam Generators. *See,* Exhibit A, Attached Project Description at pages 1-2. The Afterburner Tunnel System collects and oxidizes un-combusted gases (i.e., volatile organic materials) from the heat recovery ovens. *Id.* at page 1. As identified in the application, a Traveling Hood/Baghouse system is used on the pushing/charging machine controls that charge particulate matter emissions that might otherwise escape from the ovens, and another Baghouse is employed for the same purpose in the coke screening and crushing facilities. *Id.* Similarly, numerous Enclosures are used as control measures in various areas of material transfer to control particulate matter and fugitive dust emissions. *Id.* Each of these systems and/or devices control or minimize contaminants associated with the Heat Recovery Coke Plant that might otherwise be emitted to the atmosphere and therefore act to eliminate, prevent or reduce air pollution.[1]

[1] The Illinois EPA has reviewed the application materials and, to the best of its ability, identified those things relating to the project for which certification appears to have been sought. To the extent that the application materials sought certification of the Heat Recovery Coke Plant as a whole, the Illinois EPA must decline to offer a recommendation supporting a certification of the same. While there certainly may be incidental benefits to the environment from efforts to develop or improve heat and/or steam recovery in manufacturing activities, it is not clear here that the use of heat and/or steam energy associated with the coke plant, and particularly the Heat Recovery Steam Generators, is in the nature of a system, method, construction, device or appliance whose primary purpose relates to environmental protection.

5. Section 11-10 of the Property Tax Code, 35 ILCS 200/11-10 (2002), defines "pollution control facilities" as:

> "any system, method, construction, device or appliance appurtenant thereto, or any portion of any building or equipment, that is designed, constructed, installed or operated for the primary purpose of: (a) eliminating, preventing, or reducing air or water pollution... or (b) treating, pretreating, modifying or disposing of any potential solid, liquid, gaseous pollutant which if released without treatment, pretreatment, modification or disposal might be harmful, detrimental or offensive to human, plant or animal life, or to property."

6. Pollution control facilities are entitled to preferential tax treatment, as provided by 35 ILCS 200/11-5 (2002).

7. Based on information in the application and the primary purpose of the Lime Spray Dryer Absorber, Fabric Filter systems, Afterburner Tunnel System and other control measures identified above to prevent or reduce air pollution, it is the Illinois EPA's engineering judgment that such systems, devices and related appurtenances may be considered as "pollution control facilities" in accordance with the statutory definition and consistent with the Board's regulations at 35 Ill. Adm. Code 125.200. **[Exhibit C].**

8. Because the information in the application demonstrates that the Lime Spray Dryer Absorber, Fabric Filter systems, Afterburner Tunnel System and other control measures satisfy the aforementioned statutory and regulatory criteria, the Illinois EPA recommends that the Board **issue** the applicant's requested tax certification.

Respectfully submitted by,

/s/ *Robb H. Layman*
Robb H. Layman
Assistant Counsel

DATED: December 6, 2013

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
1021 North Grand Avenue East
P.O. Box 19276
Springfield, Illinois 62794-9276
Telephone: (217) 524-9137

CERTIFICATE OF SERVICE

I hereby certify that on the 6th day of December, 2013, I electronically filed the following instruments entitled **NOTICE, APPEARANCE** and **RECOMMENDATION** with:

John Therriault, Clerk
Illinois Pollution Control Board
100 West Randolph Street
Suite 11-500
Chicago, Illinois 60601

and, further, that I did send a true and correct paper copy of the same foregoing instruments, by First Class Mail with postage thereon fully paid and deposited into the possession of the United States Postal Service, to:

Steve Santarelli
Illinois Department of Revenue
101 West Jefferson
P.O. Box 19033
Springfield, Illinois 62794

SunCoke Energy
Richard F. Booker, Esquire
1735 Market Street, 15th Floor
Philadelphia, Pennsylvania 19103

/s/ Robb H. Layman
Robb H. Layman
Assistant Counsel

Sunoco, Inc.
1735 Market Ste LL
Philadelphia, PA 19103-7583
Richard F. Booker
(215) 977-6010

VIA FEDEX
December 28, 2009

Alan Keller, P.E.
Manager, Permits Section
Illinois Environmental Protection Agency
/ Bureau of Water
1021 N Grand Ave E
Springfield, IL 62702

Ed Bakowski
Illinois Environmental Protection
Agency / Dept. of Air Pollution Cont.
1021 N Grand Ave E
Springfield, IL 62702

Re: SunCoke Energy, Inc. – Gateway Energy & Coke Company, LLC, Application for Certification of Pollution Control Facilities - State Route 203, Granite City Illinois

Dear Messrs. Keller and Bakowski:

On behalf of SunCoke Energy, Inc. and its subsidiary, Gateway Energy & Coke Company, LLC (both of which are wholly owned subsidiaries of Sunoco, Inc.), we do hereby respectfully submit our Application for Certification of Pollution Control Facilities with respect to above referenced location.

We greatly appreciate the opportunity to review this application with you, and look forward to working with you on this matter.

Very truly yours,

Richard F. Booker,
Senior Tax Counsel and
Manager, State and Local Tax
Sunoco, Inc. (R&M)

RFB:
Enclosures
cc: G. Gentry
R. Deitz, Esq. (w/o enc.)
M. Prendergast (USS; via Fax w/o enc.)

Exhibit A

APPLICATION FOR CERTIFICATION (PROPERTY TAX TREATMENT)
POLLUTION CONTROL FACILITY
AIR ☒ WATER ☐

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
P. O. Box 19276, Springfield, IL 62794-9276

This Agency is authorized to request this information under Illinois Revised Statues, 1979, Chapter, 120, Section 502a-5. Disclosure of this information is voluntary. However, failure to comply could prevent your application from being processed or could result in denial of your application for certification.

FOR AGENCY USE

File No.	Date Received	Certification No.	Date

Sec. A — APPLICANT

Company Name			
SunCoke Energy			
Person Authorized to Receive Certification		**Person to Contact for Additional Details**	
Richard F. Booker, Esq.		John Mendillo	
Street Address		**Street Address**	
1735 Market Street, 15th Floor		11400 PARKSIDE DRIVE	
Municipality, State & Zip Code		**Municipality, State & Zip Code**	
Philadelphia, PA 19103		KNOXVILLE, TN 37934	
Telephone Number		**Telephone Number**	
(215) 977-6010		(865) 288-5257	
Location of Facility		**Municipality**	**Township**
Quarter Section / **Township** / **Range**		Granite City, IL	3N
19 / 3N / 9W			
Street Address		**County**	**Book Number**
State Route 203		Madison	5
Property Identification Number		**Parcel Number**	
22-2-20-1-00-000-004.002		22-2-20-1-00-000-004.002	

Sec. B — MANUFACTURING OPERATIONS

Nature of Operations Conducted at the Above Location

Production of metalurgical coke, used in steel production (heat recovery coke plant).

Water Pollution Control Construction Permit No. 2009IA1747	Date Issued 01/09/09	
NPDES PERMIT No. ILR006808	Date Issued 08/27/09	Expiration Date 04/30/14
Air Pollution Control Construction Permit No. 06070020	Date Issued 03/13/08	
Air Pollution Control Operating Permit No. N/A	Date Issued	

Sec. C — MANUFACTURING PROCESS

Describe Unit Process

SunCoke Energy furnishes metallurgical coke to integrated steel makers utilizing blast furnace technology. Ovens operate on a regenerative principle that separates coal into carbon in solid state and transforms volatile matter into gases. These toxic gases are then thermally destroyed.

Materials Used in Process

A horizontal bed of coal approximately 1m deep, 4m wide and 14m long is charged into the side of a hot oven using a leveling conveyor. SunCoke Energy uses large batch coal charges and 48-hour coking cycles.

Sec. D — POLLUTION CONTROL FACILITY DESCRIPTION

Describe Pollution Abatement Control Facility

See attached description of pollution control facilities

Sec. E — POLLUTION CONTROL FACILITY – CONTAMINANTS / ACCOUNTING DATA

(1) Nature of Contaminants or Pollutants

Contaminant or Pollutant	Material Retained, Captured or Recovered: DESCRIPTION	DISPOSAL OR USE
Particulate Matter/Sulfur Dioxide	Spray dryer/Baghouse	Fly ash sent to municipal landfill
Particulate Matter	PCM Baghouse	Dust recycle back to coal stock
Particulate Matter	Hot Car Multiclone	Reclaim dust to coke breeze
Particulate Matter	Coke Screen Baghouse	Reclaim dust to coke breeze ($7/ton)
Particulate Matter (see also air permit attch'd.)	Wet Supression	N/A (dust control)

(2) Point(s) of Waste Water Discharge

	Plans and Specifications Attached	Yes ☒	No ☐
(3)	Are contaminants (or residues) collected by the control facility?	Yes ☒	No ☐
(4)	Date installation completed 10/09/09 status of installation on date of application		
(5) a.	FAIR CASH VALUE IF CONSIDERED REAL PROPERTY:	$ 62,272,093.00	
b.	NET SALVAGE VALUE IF CONSIDERED REAL PROPERTY:	$ 500,000.00	
c.	PRODUCTIVE GROSS ANNUAL INCOME OF CONTROL FACILITY:	$ 321,930.00	
d.	PRODUCTIVE NET ANNUAL INCOME OF CONTROL FACILITY:	$ 0.00	
e.	PERCENTAGE CONTROL FACILITY BEARS TO WHOLE FACILITY VALUE:	% 20.3	

Sec. F — SIGNATURE

The following information is submitted in accordance with the Illinois Property Tax Code, as amended, and to the best of my knowledge, is true and correct. The facilities claimed herein are "pollution control facilities" as defined in Section 11-10 of the Illinois Property Tax Code.

Signature — Mgr. State and Local Taxes (Title)

Sec. G — INSTRUCTIONS

INSTRUCTIONS FOR COMPILING AND FILING APPLICATION

General: Separate applications must be completed for each control facility claimed. Do not mix types (water and air). Where both air and water operations are related, file two applications. If attachments are needed, record them consecutively on an index sheet.

Sec. A	Information refers to applicant as listed in the tax records and the person to be contacted for further details or for inspection of facilities. Define facility location by street address or legal description. A plat map location is required for facilities located outside of municipal boundaries. The property identification number is required.
Sec. B	Self-explanatory. Submit copies of all permits issued by local pollution control agencies. (e.g. MSD Construction Permit)
Sec. C	Refers to manufacturing processes or materials on which pollution control facility is used.
Sec. D	Narrative description of the pollution control facility, indicating that its primary purpose is to eliminate, prevent or reduce pollution. State the type of control facility. State permit number, date, and agency issuing permit. A narrative description and a process flow diagram describing the pollution control facility. Include a listing of each major piece of equipment included in the claimed fair cash value for real property. Include an average analysis of the influent and effluent of the control facility stating the collection efficiency.
Sec. E	List air contaminants, or water pollution substances released as effluents to the manufacturing processes. List also the final disposal of any contaminants removed from the manufacturing processes. Item (1) – Refers to pollutants and contaminants removed from the process by the pollution control facility. Item (2) – Refers to water pollution but can apply to water-carried wastes from air pollution control facilities. Submit drawings, which clearly show (a) Point(s) of discharge to receiving stream, and (b) Sewers and process piping to and from the control facility. Item (3) – If the collected contaminants are disposed of other than as wastes, state the disposition of the materials, and the value in dollars reclaimed by sale or reuse of the collected substances. State the cost of reclamation and related expense. Item (4) – State the date which the pollution control facility was first placed in service and operated. If not, explain. Item (5) – This information is essential to the certification and assessment actions. This accounting data must be completed to activate project review prior to certification by this Agency.
Sec. F	Self-explanatory. Signature must be a corporate authorized signature.

Submit to:	Attention:	Attention:
Illinois EPA P.O. Box 19276 Springfield, IL 62794-9276	Al Keller Permit Section Division of Water Pollution Control	Donald E. Sutton Permit Section Division of Air Pollution Control

GATEWAY ENERGY & COKE COMPANY
HEAT RECOVERY COKE PLANT AND POLLUTION CONTROL EQUIPMENT
DESCRIPTION

The Gateway Energy and Coke Company (GECC) will use SunCoke Energy's Jewell-Thompson heat recovery oven. In the coke production process with both heat recovery and byproduct ovens, the volatile fraction of the coal is driven off in a reducing atmosphere. Coke is essentially the remaining carbon and ash. With byproduct ovens, the volatiles and combustion products are collected downstream of the oven chamber and refined in a chemical plant to produce coke oven gas and other products such as tar, ammonia, and light oils. In heat recovery ovens, all of the coal volatiles are oxidized within the ovens.

Each technology has its own set of design objectives that affect its emissions. Both types of ovens are typically constructed of refractory brick shapes and other materials that can form small cracks in the refractory and around the removable parts with day-to-day operation. Byproduct ovens are kept at a positive pressure to avoid oxidizing recoverable products and overheating the ovens. Heat recovery ovens are operated at a negative pressure, adding air from the outside to oxidize volatile matter and release the heat of combustion within the oven system. The opposing operating pressure condition and handling of combustion within the oven system are important design differences between heat recovery ovens and byproduct ovens. Because of their positive pressure operation, small openings or cracks in byproduct ovens allow raw coke oven gas (and hazardous pollutants) to leak into the atmosphere. The openings or cracks in the heat recovery ovens simply allow additional air to be drawn into the oven.

Figure 2-1 shows a cut-away diagram of a heat recovery oven. Coal is charged onto the oven floor at the beginning of the cycle. Heat from the hot refractory starts the carbonization cycle. Air is first introduced into the oven crown. Partially combusted gases pass into the sole flue system beneath the oven floor where essentially all combustion is completed. The gases then pass into an afterburner tunnel where any remaining uncombusted gases are oxidized. The afterburner tunnel system then routes the hot gases to the heat recovery steam generators (HRSGs) where excess waste heat is removed.

Coal comes into the facility by truck. Emissions from material transfer are controlled by enclosures except in a few areas where the potential to overheat coal or interfere with dispersion of steam from coke may pose a safety hazard. A traveling hood/baghouse system on the pushing/charging machine controls charging emissions that may escape the ovens. A mobile flat push hot car with a multi-cyclone system captures emissions during coke pushing. Quenching of the coke is performed in a conventional quench tower with baffles. Quenching emissions are controlled by using water with total dissolved solids (TDS) levels less than or equal to 1,100 mg/L for quenching and by a unique baffle design in the tower. A baghouse controls PM emissions from the coke screening and crushing facilities. Plant roads are paved to also control PM. HRSGs recover heat from the oven waste gases by transferring the heat to the production of high quality steam, protecting the downstream pollution control devices. Downstream of the HRSGs,

particulate matter (PM) and sulfur dioxide (SO_2) are removed from the oven gases in a lime spray dryer absorber (SDA) and fabric filter baghouse system.

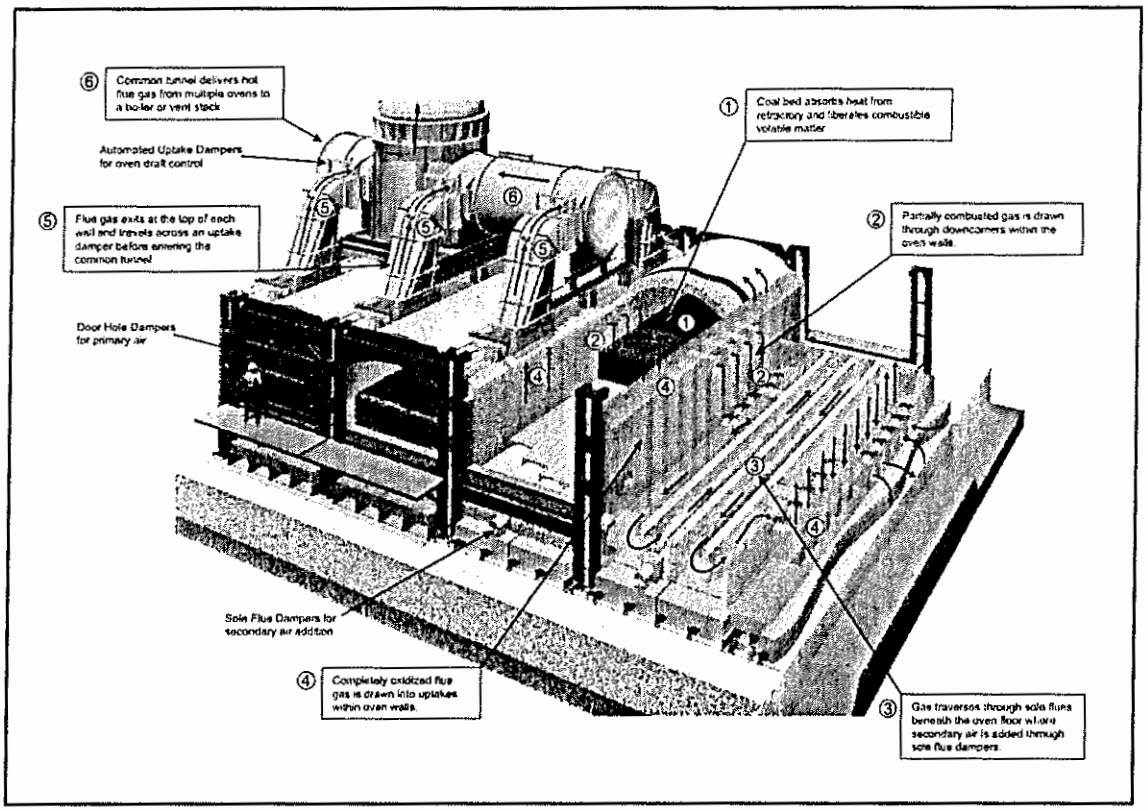


Figure 2-1. SunCoke Energy Heat Recovery Oven Diagram

The individual waste heat stacks will be used during annual inspection and maintenance of each HRSG so that these procedures can be performed safely. The maximum time that will be required for maintenance and inspection of each HRSG is 8 days/year. The planned outages will be scheduled so that the HRSGs are taken off-line one at a time for maintenance and inspection. On an annual basis, 96% of the waste gases from the ovens will pass through the SDA and baghouse.

The SDA/baghouse is designed so that much of the routine inspection and maintenance can be performed while the system is operating. For example, the rotary atomizers can be interchanged during operation, and external components such as hopper heaters, level detectors, and the filter bag cleaning system for individual baghouse compartments can all be inspected and replaced during normal operation.

The baghouse is oversized with extra compartments so that a compartment can be offline during operation, allowing filter bags and cages to be inspected and replaced when

necessary. In addition, the exhaust gas system includes three induced draft (ID) fans, each sized to 50% of maximum capacity, so that one of the three fans may be maintained off-line for inspection and maintenance.

The supplier of the emissions control equipment (Hamon Research-Cottrell) recommends an annual internal inspection for SDA and baghouse installations at coal-fired power plants. Quick inspections are also needed during unexpected plant forced outages. Recognizing the more challenging service for a heat recovery coking facility, they recommend an aggressive preventive maintenance program for optimum performance that will promote the maximum effective service life of all components. The six waste heat stacks will be opened during maintenance so that the work can be performed safely and the ovens will remain hot and the oven pressures will remain negative.

The process is illustrated schematically in Figures 2-2 through 2-4. Figure 2-2 shows the coal processing, Figure 2-3 shows the coke plant, and Figure 2-4 shows the coke processing.

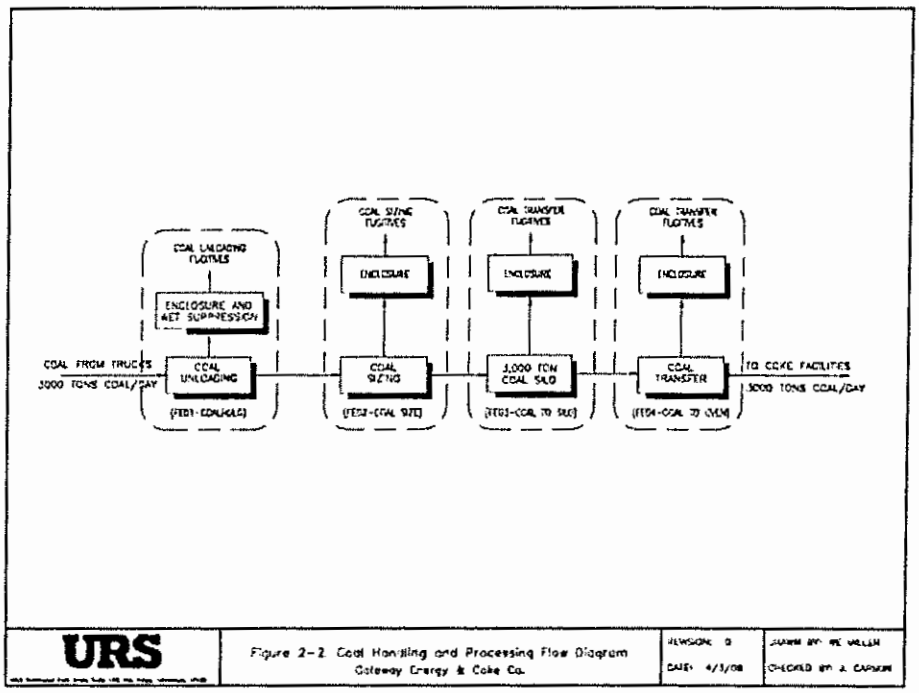


Figure 2-2. Coal Handling and Process Flow Diagram

GATEWAY ENERGY & COKE COMPANY
HEAT RECOVERY COKE PLANT AND POLLUTION CONTROL EQUIPMENT
DESCRIPTION

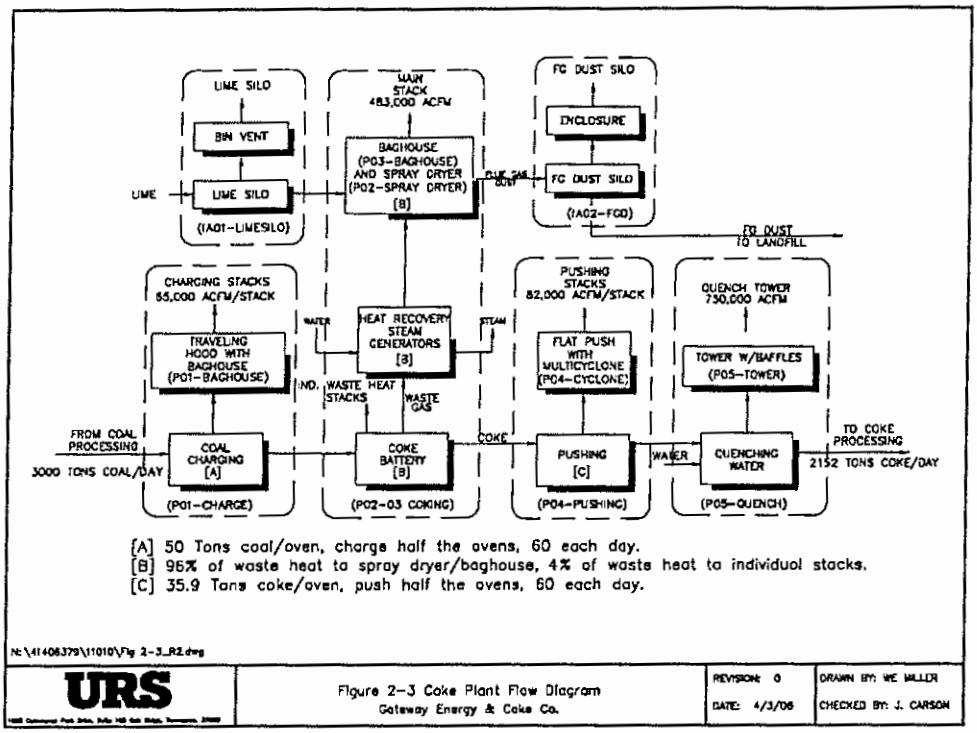


Figure 2-3. Coke Plant Flow Diagram

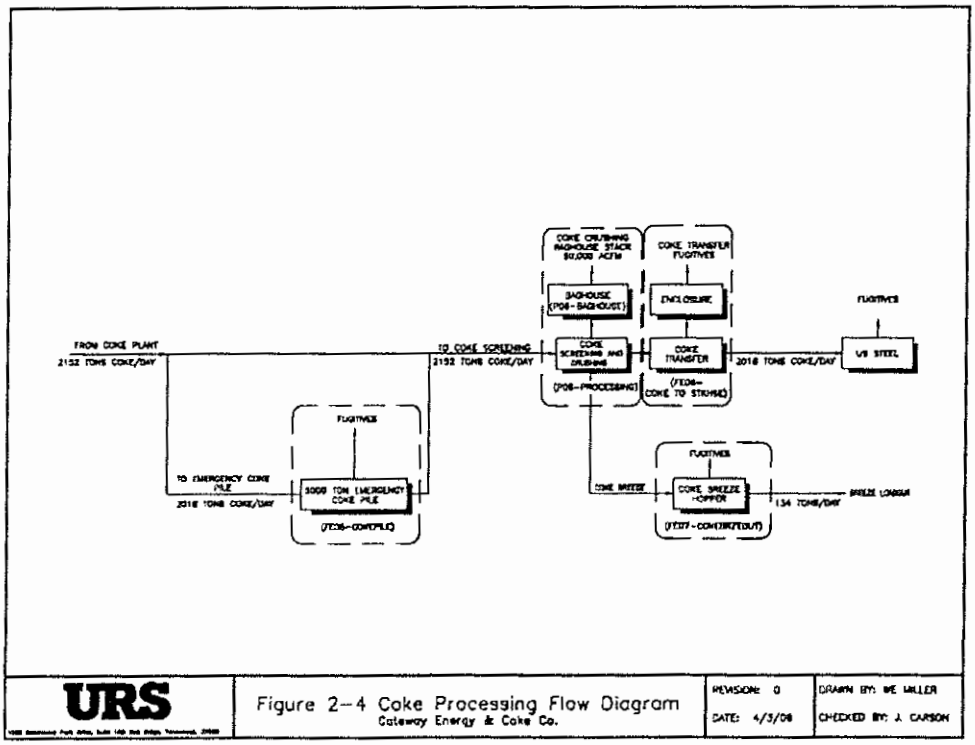


Figure 2-4. Coke Processing Flow Diagram

Gateway Capital Cost Projection Summary Report
Project # 772-07-0001
December 2009 - Projections and Spending & Commitments

WBS				Area Description	Original Budget	Approved Revisions	Current Budget	Estimate at Completion	Allocation %	Allocation Amount ($)	Comment
				General Plant							
Area	Sub	Det.	CE*								
00	01	40	4	Site Prep, Grading, Paving	5,469,000		5,469,000	5,473,685	15%	$821,053	Paving for dust control, runoff containment
00				New Gate, Road Parking							
00	04	40	4	Buildings	2,850,000		2,850,000	2,850,960			
00	05	40	4	Trackwork	2,100,000		2,100,000	2,100,000			
00	06	40	4	Fencing	410,000		410,000	410,000			
00	07	40	4	Piling	4,200,000		4,200,000	4,232,492			
				Dewatering							
00 Total				General Plant	15,029,000	-	15,029,000	15,067,137			
				Coke Ovens							
01	11	01	2	Oven & Pusher Slab Embeds	1,411,000		1,411,000	1,411,000	10%	$141,100	Portion associated with runoff control
01	11	22	2	Oven Slab Castable Mat'l		1,236,000	1,236,000	1,325,024	15%	$198,754	
01	11	40	4	Oven & Pusher Slab Sub	12,000,000		12,000,000	12,000,000	10%	$1,200,000	Portion associated with runoff control
01	12	41	4	Winter Conditions (Gas for heating)	1,250,000		1,250,000	231,549			
01	12	00	2	Brick and Refractory Materials	19,604,000	(1,236,000)	18,368,000	20,377,924	15%	$3,056,599	
01	12	01	2	Thermal Ceramics Settlement			-	(935,390)			
01	12	x	2	Oven #9 Repair			-	330,000			
01	12	xx	2	Oven #9 Insurance recovery			-	(400,000)			
01	12	xxx	4	Refractory Material to Middletown			-	(466,000)			
01	12	20	2	Temporary Sheds	1,460,000		1,460,000	1,041,334			
01	12	40	4	Oven & Quench Contractor	40,085,000		40,085,000	40,085,204	15%	$6,012,781	
01	13	20	2	Pre-Cast Structural Mat'l	3,650,000		3,650,000	3,732,947	15%	$559,942	
01	13	21	2	Pre-Cast Refr. Components	-		-	-			
01	13	40	4	Pre-Cast Components Sub			-	-			
01	14	20	2	Hot Ductwork Structural Mat'l			3,900,000		100%	$3,900,000	
01	14	21	2	Hot Ductwork Refr. Mat'l	-		-	-			
01	14	40	4	Hot Ductwork Sub	-		-	-			
01	15	20	2	Oven Structural Mat'l	5,570,000	132,000	5,702,000	5,702,000	15%	$855,300	
01	15	40	4	Oven Structural Sub	-		-	-			
01	16	20	2	Oven Mech. & Piping Mat'l			150,000		75%	$112,500	Excl. Nat. gas & other misc. non-poll. piping
01	16	40	4	Oven Mech. & Piping Sub	-		-	-			
01	17	40	4	Oven Electrical Sub			3,769,000		75%	$2,826,810	Excl. Lighting & other misc. non-poll. Electrical
01	18	20	2	Misc. Oven Mat'l	300,000	(132,000)	168,000	25,000	15%		
01	18	21	2	Oven Instruments	600,000		600,000	810,612	25%	$202,653	
01	18	40	4	Oven I &C Sub	-		-	-			
01	19	40	4	Oven Heat-up Sub	958,000		958,000	639,388	20%	$127,878	
01	19	41	4	Oven Heat-up Support	400,000		400,000	1,434,101	20%	$286,820	
				Heat up Fuel - By USS							
01 Total				Coke Ovens	95,107,000	-	95,107,000	95,163,173			
				Coal Handling							
02	21	20	2	Truck Unloading Mat'l	1,738,000		1,738,000	1,750,000			
02	21	40	4	Material Handling Sub	3,131,000		3,131,000	3,848,688	10%	$384,869	
02	21	21	2	Crusher Building Mat'l	1,350,000		1,350,000	1,357,035	10%	$135,704	
02	21	41	4	Crusher Building Sub	-		-	1,984			
02	22	21	2	Coal Silo Materials	2,050,000		2,050,000	2,050,000	10%	$205,000	
02	22	40	4	Coal Silo Sub	-		-	-			
02	23	20	2	Coal Conveyors Mat'l	2,115,000		2,115,000	2,115,000			
02	23	40	4	Coal Conveyors Sub	-		-	-			
02	24	20	2	Tripper Conveyor Mat'l	1,300,000		1,300,000	1,303,542			
02	24	40	4	Tripper Conveyor Sub	-		-	-			
02	26	40	4	Coal Handling Civil	1,953,000		1,953,000	1,953,000	10%	$195,300	
02	27	21	2	Coal & Coke Handling Instruments Supply	225,000		225,000	125,000	10%	$12,500	
02	27	40	4	Coal Handling Electrical	946,000		946,000	945,670	10%	$94,567	
02 Total				Coal Handling	14,808,000	-	14,808,000	15,449,919			
				Coke Handling							

Proposed Pollution Control Equipment Allocations Per SunCoke Energy Engineering & Technology Group and Project Controls

01	13	20	2	Pre-Cast Structural Matl	[redacted]		3,650,000	[redacted]	15%	$559,942
01	13	21	2	Pre-Cast Refr. Components	-		-	-		
01	13	40	4	Pre-Cast Components Sub			-	-		
01	14	20	2	Hot Ductwork Structural Matl	[redacted]		3,900,000	[redacted]	100%	$3,900,000
01	14	21	2	Hot Ductwork Refr. Matl	-		-	-		
01	14	40	4	Hot Ductwork Sub	-		-	-		
01	15	20	2	Oven Structural Matl	5,570,000	132,000	5,702,000	5,702,000	15%	$855,300
01	15	40	4	Oven Structural Sub	-		-	-		
01	16	20	2	Oven Mech. & Piping Matl	[redacted]		150,000	[redacted]	75%	$112,500 Excl. Nat. gas & other misc. non-poll. piping
01	16	40	4	Oven Mech. & Piping Sub	-		-	-		
01	17	40	4	Oven Electrical Sub	[redacted]		3,760,000	[redacted]	75%	$2,826,810 Excl. Lighting & other misc. non-poll. Electrical
01	18	20	2	Misc. Oven Matl	300,000	(132,000)	168,000	84,000	15%	$12,600
01	18	21	2	Oven Instruments	810,000		600,000	810,000	25%	$202,653
01	18	40	4	Oven I &C Sub	-		-	-		
01	19	40	4	Oven Heat-up Sub	958,000		958,000	639,388	20%	$127,878
01	19	41	4	Oven Heat-up Support	400,000		400,000	734,101	20%	$286,820
				Heat up Fuel - By USS						
01 Total				Coke Ovens	95,107,000	-	95,107,000	95,163,173		
				Coal Handling						
02	21	20	2	Truck Unloading Matl	1,738,000		1,738,000	1,750,000		
02	21	40	4	Material Handling Sub	3,131,000		3,131,000	3,648,688	10%	$384,869
02	21	21	2	Crusher Building Matl	1,350,000		1,350,000	1,357,035	10%	$135,704
02	21	41	4	Crusher Building Sub	-		-	1,984		
02	22	21	2	Coal Silo Materials	2,050,000		2,050,000	2,050,000	10%	$205,000
02	22	40	4	Coal Silo Sub	-		-	-		
02	23	20	2	Coal Conveyors Matl	2,115,000		2,115,000	2,115,000		
02	23	40	4	Coal Conveyors Sub	-		-	-		
02	24	20	2	Tripper Conveyor Matl	1,300,000		1,300,000	1,303,542		
02	24	40	4	Tripper Conveyor Sub	-		-	-		
02	26	40	4	Coal Handling Civil	1,953,000		1,953,000	1,953,000	10%	$195,300
02	27	21	2	Coal & Coke Handling Instruments Supply	225,000		225,000	125,000	10%	$12,500
02	27	40	4	Coal Handling Electrical	946,000		946,000	945,670	10%	$94,567
02 Total				Coal Handling	14,808,000	-	14,808,000	15,448,519		
				Coke Handling						
03	31	20	2	Quench system Matls	800,000		800,000	808,031	5%	$40,402 Quench tower baffles
03	31	21	2	Quench Pumps Supply	50,000		50,000	299		
03	31	40	4	Quench system Sub	-		-	1,323		
03	32	20	2	Wharf System Materials	1,800,000		1,800,000	1,800,000		
03	32	40	4	Wharf System Installation	-		-	-		
03	33	20	2	Coke Storage & Conveying Matl	825,000		825,000	878,509		
03	33	40	4	Coke Storage & Conveying Sub	-		-	-		
03	34	20	2	Screening Station Matl	1,650,000		1,650,000	1,650,000	10%	$165,000
03	34	40	4	Screening Station Sub	-		-	-		
03	36	40	4	Coke Handling Civil	5,647,000		5,647,000	5,647,000	10%	$564,700
03	37	40	4	Coke Handling Electrical	1,188,000		1,188,000	1,189,025	10%	$118,903
03 Total				Coke Handling	11,960,000	-	11,960,000	11,975,246		
				Machinery						
04	41	20	2	PCM Supply	3,645,000		3,645,000	3,662,811	10%	$366,281 Dust collection baghouse & peripherals
04	41	40	4	Install Machinery - Mechanical (Kokosing)	1,185,000		1,185,000	755,376	5%	$37,769 Partial allocation only.
04	42	20	2	Door Machines Supply	820,000		820,000	812,500		
04	42	40	4	Install Machinery - Piping (Icon)	25,000		25,000	978,171		
04	43	20	2	Flat Push Hot Car Supply	1,420,000		1,420,000	1,414,325	10%	$141,433 Dust collection cyclone & peripherals
04	43	40	4	Install Machinery - Electrical (Guarantee)	115,000		115,000	527,855		
04	44	20	2	Quench Car Supply	865,000		865,000	891,200		
04	44	40	4	Install Quench Car	40,000		40,000	-		
04	45	20	2	Stationary Ram Supply	455,000		455,000	641,351		
04	45	40	4	Install Stationary Ram	100,000		100,000	-		
04	45	41	4	Stationary Ram Foundation	75,000		75,000	75,000		
04	46	20	2	Diesel Generator Supply	-		-	-		
04	46	40	4	Install Diesel Generator	25,000		25,000	-		
04	47	21	2	Machinery Elects & Controls	175,000		175,000	180,572	5%	$9,029 Prorate based above items a % of total
04	47	50	5	Machinery Project Management & Engineering	300,000		300,000	268,875	5%	$13,444 Prorate based above items a % of total
04 Total				Machinery	9,245,000	-	9,245,000	9,878,126		
				Environmental Control						
05	51	22	2	FGD Sump Pumps	-		-	55,044		
05	51	40	4	Interconnecting Pipe Rack (Kokosing)	3,100,000		3,100,000	1,967,556		
05	51	41	4	Cold Duct (Kokosing)	5,900,000		5,900,000	2,885,833		
05	52	01	2	FGD System Supply	15,628,000		15,628,000	16,010,000		
05	52	02	2	FGD System-Added Permit Items Supply	350,000		350,000	760,613		
05	52	20	2	FGD System Controls	-		-	-		
05	52	21	2	CEMs System Supply	265,000		265,000	337,484		
05	52	22	2	CEMs for PM System Supply	200,000		200,000	-		
05	52	40	4	FGD System Installation (Bowen)	11,000,000		11,000,000	12,825,000		
05	52	41	4	Supply & Install Stack	921,000		921,000	1,052,527		
				Supply & Install Stack				968,292		
05	55	40	4	FGD & Cold Duct Insulation	2,350,000		2,350,000	2,350,000		
05	56	40	4	FGD Civil	1,990,000		1,990,000	1,990,000		
05	57	40	4	FGD Electrical	2,712,000		2,712,000	2,712,359		
05 Total				Environmental Control	[redacted]	-	44,416,000	[redacted]	100%	$43,974,708
				Heat-Recovery						
06	61	01	2	HRSG's - Supply	17,657,000		17,657,000	17,657,000		
06	61	21	2	Gas Sparging Instruments Supply	300,000		300,000	-		
06	61	22	2	HRSG's Sumps & Pumps Supply	65,000		65,000	190,409		
06	61	23	2	BOP PF Piping & Equip. Supply	145,000	2,014,688	2,159,688	2,400,000		
06	61	40	4	HRSG Installation Labor (Kokosing)	5,200,000		5,200,000	7,152,948		
				Pipe Support Hangers				728		
06	62	40	4	Piping Installation (Icon)	9,314,000	(1,864,000)	7,450,000	19,077,195		
06	63	20	2	Misc. Piping Materials (HRSG B/D)	-		-	350,000		
06	63	40	4	HRSG/Piping Insulation & Tracing	3,938,000		3,938,000	2,601,407		
06	64	40	4	HRSG Civil	920,000		920,000	920,000		
06	65	40	4	HRSG I & C	3,064,000	(150,000)	2,914,000	2,913,555		
06	65	41	4	Heat Recovery SU-Cleaning & Testing	850,000		850,000	1,349,639		
06	65	42	4	Heat Recovery SU-Misc Expenses	50,000		50,000	50,000		
06	63	43	4	Heat Recovery SU-Construction Support	500,000		500,000	1,916,430		
06	65	44	4	Heat Recovery SU-Vendor Reps	150,000		150,000	150,000		
06 Total				Heat-Recovery	[redacted]	333	42,353,688	[redacted]	100%	$57,109,311
				Plant Instrumentation & Controls						
07	71	20	2	System Integration Matl (Crowne)	3,300,000		3,300,000	2,450,000		
07	71	40	4	System Integration Installation	-		-	724,000		
07	72	21	2	Field Mounted Instruments	450,000		450,000	125,000		
07	72	22	2	Control Valves	180,000		180,000	180,000		
07	72	23	2	Flow Meters	85,000		85,000	-		
07	75	21	2	UPS/Batteries	225,000		225,000	-		
07 Total				Plant Instrumentation & Controls	4,250,000	-	4,250,000	3,479,000	10%	$347,900

Gateway Capital Cost Projection Summary Report
Project # 772-07-0001
December 2009 - Projections and Spending & Commitments

WBS				Area Description	Original Budget	Approved Revisions	Current Budget	Estimate at Completion	Proposed Pollution Control Equipment Allocations Per SunCoke Energy Engineering & Technology Group and Project Controls: Allocation %	Allocation Amount ($)	Comment
				General Plant							
Area	Sub	Det.	CE*								
00	01	40	4	Site Prep, Grading, Paving	5,469,000		5,469,000	5,473,685	15%	$821,053	Paving for dust control, runoff containment
00				New Gate, Road Parking							
00	04	40	4	Buildings	2,850,000		2,850,000	2,850,960			
00	05	40	4	Trackwork	2,100,000		2,100,000	2,100,000			
00	06	40	4	Fencing	410,000		410,000	410,000			
00	07	40	4	Piling	4,200,000		4,200,000	4,232,492			
				Dewatering							
00 Total				General Plant	15,029,000	-	15,029,000	15,067,137			
				Coke Ovens							
01	11	01	2	Oven & Pusher Slab Embeds	1,411,000		1,411,000	1,411,000	10%	$141,100	Portion associated with runoff control
01	11	22	2	Oven Slab Castable Matl		1,236,000	1,236,000	1,335,024	15%	$198,754	
01	11	40	4	Oven & Pusher Slab Sub	12,000,000		12,000,000	12,000,000	10%	$1,200,000	Portion associated with runoff control
01	12	41	4	Winter Conditions (Gas for heating)	1,250,000		1,250,000	231,549			
01	12	00	2	Brick and Refractory Materials	19,604,000	(1,236,000)	18,368,000	20,377,324	15%	$3,056,599	
01	12	01	2	Thermal Ceramics Settlement			-	(935,390)			
01	12	x	2	Oven #9 Repair			-	330,000			
01	12	xx	2	Oven #9 Insurance recovery			-	(400,000)			
01	12	xxx	4	Refractory Material to Middletown			-	(466,000)			
01	12	20	2	Temporary Sheds	1,460,000		1,460,000	1,041,334			
01	12	40	4	Oven & Quench Contractor	40,085,000		40,085,000	40,085,204	15%	$6,012,781	
01	13	20	2	Pre-Cast Structural Matl	3,650,000		3,650,000	3,732,547	15%	$559,942	
01	13	21	2	Pre-Cast Refr. Components	-		-	-			
01	13	40	4	Pre-Cast Components Sub	-		-	-			
01	14	20	2	Hot Ductwork Structural Matl	3,900,000		3,900,000	-	100%	$3,900,000	
01	14	21	2	Hot Ductwork Refr. Matl	-		-	-			
01	14	40	4	Hot Ductwork Sub	-		-	-			
01	15	20	2	Oven Structural Matl	5,570,000	132,000	5,702,000	5,702,000	15%	$855,300	
01	15	40	4	Oven Structural Sub	-		-	-			
01	16	20	2	Oven Mech. & Piping Matl			150,000		75%	$112,500	Excl. Nat. gas & other misc. non-poll. piping
01	16	40	4	Oven Mech. & Piping Sub	-		-	-			
01	17	40	4	Oven Electrical Sub	3,769,000		3,769,000		75%	$2,826,810	Excl. Lighting & other misc. non-poll. Electrical
01	18	20	2	Misc. Oven Matl	300,000	(132,000)	168,000	25,000	15%		
01	18	21	2	Oven Instruments	609,000		609,000	810,612	25%	$202,653	
01	18	40	4	Oven I &C Sub	-		-	-			
01	19	40	4	Oven Heat-up Sub	958,000		958,000	639,388	20%	$127,878	
01	19	41	4	Oven Heat-up Support	400,000		400,000	434,101	20%	$286,820	
				Heat up Fuel - By USS							
01 Total				Coke Ovens	95,107,000	-	95,107,000	95,163,173			
				Coal Handling							
02	21	20	2	Truck Unloading Matl	1,738,000		1,738,000	1,750,000			
02	21	40	4	Material Handling Sub	3,131,000		3,131,000	3,848,688	10%	$384,869	
02	21	21	2	Crusher Building Matl	1,350,000		1,350,000	1,357,035	10%	$135,704	
02	21	41	4	Crusher Building Sub	-		-	1,984			
02	22	21	2	Coal Silo Materials	2,050,000		2,050,000	2,050,000	10%	$205,000	
02	22	40	4	Coal Silo Sub	-		-	-			
02	23	20	2	Coal Conveyors Matl	2,115,000		2,115,000	2,115,000			
02	23	40	4	Coal Conveyors Sub	-		-	-			
02	24	20	2	Tripper Conveyor Matl	1,300,000		1,300,000	1,303,542			
02	24	40	4	Tripper Conveyor Sub	-		-	-			
02	26	40	4	Coal Handling Civil	1,953,000		1,953,000	1,953,000	10%	$195,300	
02	27	21	2	Coal & Coke Handling Instruments Supply	225,000		225,000	125,000	10%	$12,500	
02	27	40	4	Coal Handling Electrical	946,000		946,000	945,670	10%	$94,567	
02 Total				Coal Handling	14,808,000	-	14,808,000	15,449,919			
				Coke Handling							
03	31	20	2	Quench system Matl's	800,000		800,000	808,031	5%	$40,402	Quench tower baffles
03	31	21	2	Quench Pumps Supply	50,000		50,000	299			
03	31	40	4	Quench system Sub	-		-	1,323			
03	32	20	2	Wharf System Materials	1,800,000		1,800,000	1,800,000			
03	32	40	4	Wharf System Installation	-		-	-			
03	33	20	2	Coke Storage & Conveying Matl	825,000		825,000	879,568			
03	33	40	4	Coke Storage & Conveying Sub	-		-	-			
03	34	20	2	Screening Station Matl	1,650,000		1,650,000	1,650,000	10%	$165,000	
03	34	40	4	Screening Station Sub	-		-	-			
03	36	40	4	Coke Handling Civil	5,647,000		5,647,000	5,647,000	10%	$564,700	
03	37	40	4	Coke Handling Electrical	1,188,000		1,188,000	1,189,025	10%	$118,903	
03 Total				Coke Handling	11,960,000	-	11,960,000	11,975,246			
				Machinery							
04	41	20	2	PCM Supply	3,645,000		3,645,000	3,662,811	10%	$366,281	Dust collection baghouse & peripherals
04	41	40	4	Install Machinery - Mechanical (Kokosing)	1,185,000		1,185,000	755,376	5%	$37,769	Partial allocation only.
04	42	20	2	Door Machines Supply	820,000		820,000	812,590			
04	42	40	4	Install Machinery - Piping (Icon)	25,000		25,000	676,171			
04	43	20	2	Flat Push Hot Car Supply	1,420,000		1,420,000	1,414,325	10%	$141,433	Dust collection cyclone & peripherals
04	43	40	4	Install Machinery - Electrical (Guarantee)	115,000		115,000	527,855			
04	44	20	2	Quench Car Supply	865,000		865,000	861,200			
04	44	40	4	Install Quench Car	40,000		40,000	-			
04	45	20	2	Stationary Ram Supply	455,000		455,000	641,251			

Gateway Capital Cost Projection Summary Report
Project # 772-07-0001
December 2009 - Projections and Spending & Commitments

Proposed Pollution Control Equipment Allocations Per SunCoke Energy Engineering & Technology Group and Project Controls

WBS Area	Sub	Det.	CE*	Area Description	Original Budget	Approved Revisions	Current Budget	Estimate at Completion	Allocation %	Allocation Amount ($)	Comment
				General Plant							
00	01	40	4	Site Prep, Grading, Paving	[illegible]		5,469,000	[illegible]	15%	$821,053	Paving for dust control, runoff containment
00				New Gate, Road Parking							
00	04	40	4	Buildings	2,850,000		2,850,000	2,850,960			
00	05	40	4	Trackwork	2,100,000		2,100,000	2,100,000			
00	06	40	4	Fencing	410,000		410,000	410,000			
00	07	40	4	Piling	4,200,000		4,200,000	4,232,492			
				Dewatering							
00 Total				General Plant	15,029,000	-	15,029,000	15,067,137			
				Coke Ovens							
01	11	01	2	Oven & Pusher Slab Embeds	1,411,000		1,411,000	1,411,000	10%	$141,100	Portion associated with runoff control
01	11	22	2	Oven Slab Castable Mat'l		1,236,000	1,236,000	[illegible]	15%	$198,754	
01	11	40	4	Oven & Pusher Slab Sub	12,000,000		12,000,000	12,000,000	10%	$1,200,000	Portion associated with runoff control
01	12	41	4	Winter Conditions (Gas for heating)	1,250,000		1,250,000	231,549			
01	12	00	2	Brick and Refractory Materials	[illegible]	(1,236,000)	18,308,000	[illegible]	15%	$3,056,599	
01	12	01	2	Thermal Ceramics Settlement			-	(935,390)			
01	12	x	2	Oven #9 Repair			-	330,000			
01	12	xx	2	Oven #9 Insurance recovery			-	(400,000)			
01	12	xxx	4	Refractory Material to Middletown			-	(466,000)			
01	12	20	2	Temporary Sheds	1,460,000		1,460,000	1,041,334			
01	12	40	4	Oven & Quench Contractor	40,085,000		40,085,000	40,085,204	15%	$6,012,781	
01	13	20	2	Pre-Cast Structural Mat'l	[illegible]		3,650,000	[illegible]	15%	$559,942	
01	13	21	2	Pre-Cast Refr. Components	-		-	-			
01	13	40	4	Pre-Cast Components Sub			-	-			
01	14	20	2	Hot Ductwork Structural Mat'l	[illegible]		3,900,000	[illegible]	100%	$3,900,000	
01	14	21	2	Hot Ductwork Refr. Mat'l	-		-	-			
01	14	40	4	Hot Ductwork Sub	-		-	-			
01	15	20	2	Oven Structural Mat'l	5,570,000	132,000	5,702,000	5,702,000	15%	$855,300	
01	15	40	4	Oven Structural Sub	-		-	-			
01	16	20	2	Oven Mech. & Piping Mat'l	[illegible]		150,000	[illegible]	75%	$112,500	Excl. Nat. gas & other misc. non-poll. piping
01	16	40	4	Oven Mech. & Piping Sub	-		-	-			
01	17	40	4	Oven Electrical Sub	[illegible]		3,769,000	[illegible]	75%	$2,826,810	Excl. Lighting & other misc. non-poll. Electrical
01	18	20	2	Misc. Oven Mat'l	300,000	(132,000)	168,000	25,000	15%		
01	18	21	2	Oven Instruments	[illegible]		600,000	[illegible]	25%	$202,653	
01	18	40	4	Oven I &C Sub	-		-	-			
01	19	40	4	Oven Heat-up Sub	958,000		958,000	[illegible]	20%	$127,878	
01	19	41	4	Oven Heat-up Support	400,000		400,000	[illegible]	20%	$286,820	
				Heat up Fuel - By USS							
01 Total				Coke Ovens	95,107,000	-	95,107,000	95,163,173			
				Coal Handling							
02	21	20	2	Truck Unloading Mat'l	1,738,000		1,738,000	1,750,000			
02	21	40	4	Material Handling Sub	3,131,000		3,131,000	3,848,688	10%	$384,869	
02	21	21	2	Crusher Building Mat'l	1,350,000		1,350,000	1,357,035	10%	$135,704	
02	21	41	4	Crusher Building Sub	-		-	1,984			
02	22	21	2	Coal Silo Materials	2,050,000		2,050,000	2,050,000	10%	$205,000	
02	22	40	4	Coal Silo Sub	-		-	-			
02	23	20	2	Coal Conveyors Mat'l	2,115,000		2,115,000	2,115,000			
02	23	40	4	Coal Conveyors Sub	-		-	-			
02	24	20	2	Tripper Conveyor Mat'l	1,300,000		1,300,000	1,303,542			
02	24	40	4	Tripper Conveyor Sub	-		-	-			
02	26	40	4	Coal Handling Civil	1,953,000		1,953,000	1,953,000	10%	$195,300	
02	27	21	2	Coal & Coke Handling Instruments Supply	225,000		225,000	125,000	10%	$12,500	
02	27	40	4	Coal Handling Electrical	946,000		946,000	945,670	10%	$94,567	
02 Total				Coal Handling	14,808,000	-	14,808,000	15,449,919			
				Coke Handling							
03	31	20	2	Quench system Mat'ls	800,000		800,000	808,031	5%	$40,402	Quench tower baffles
03	31	21	2	Quench Pumps Supply	50,000		50,000	299			
03	31	40	4	Quench system Sub	-		-	1,323			
03	32	20	2	Wharf System Materials	1,600,000		1,600,000	1,600,000			
03	32	40	4	Wharf System Installation	-		-	-			
03	33	20	2	Coke Storage & Conveying Mat'l	825,000		825,000	879,568			
03	33	40	4	Coke Storage & Conveying Sub	-		-	-			
03	34	20	2	Screening Station Mat'l	1,650,000		1,650,000	1,650,000	10%	$165,000	
03	34	40	4	Screening Station Sub	-		-	-			
03	36	40	4	Coke Handling Civil	5,647,000		5,647,000	5,647,000	10%	$564,700	
03	37	40	4	Coke Handling Electrical	1,188,000		1,188,000	1,189,025	10%	$118,903	
03 Total				Coke Handling	11,960,000	-	11,960,000	11,975,246			
				Machinery							
04	41	20	2	PCM Supply	3,645,000		3,645,000	3,662,811	10%	$366,281	Dust collection baghouse & peripherals
04	41	40	4	Install Machinery - Mechanical (Kokosing)	1,185,000		1,185,000	755,376	5%	$37,769	Partial allocation only.
04	42	20	2	Door Machines Supply	820,000		820,000	812,500			
04	42	40	4	Install Machinery - Piping (Icon)	25,000		25,000	678,171			
04	43	20	2	Flat Push Hot Car Supply	1,420,000		1,420,000	1,414,325	10%	$141,433	Dust collection cyclone & peripherals
04	43	40	4	Install Machinery - Electrical (Guarantee)	115,000		115,000	527,855			
04	44	20	2	Quench Car Supply	865,000		865,000	861,200			
04	44	40	4	Install Quench Car	40,000		40,000	-			
04	45	20	2	Stationary Ram Supply	455,000		455,000	641,351			
04	45	40	4	Install Stationary Ram	100,000		100,000	-			
04	45	41	4	Stationary Ram Foundation	75,000		75,000	75,000			
04	46	20	2	Diesel Generator Supply	-		-	-			
04	46	40	4	Install Diesel Generator	25,000		25,000	-			
04	47	21	2	Machinery Elects & Controls	175,000		175,000	180,572	5%	$9,029	Prorate based above items a % of total
04	47	50	5	Machinery Project Management & Engineering	300,000		300,000	268,875	5%	$13,444	Prorate based above items a % of total
04 Total				Machinery	9,245,000	-	9,245,000	9,878,126			
				Environmental Control							
05	51	22	2	FGD Sump Pumps	-		-	95,044			
05	51	40	4	Interconnecting Pipe Rack (Kokosing)	3,100,000		3,100,000	1,957,556			
05	51	41	4	Cold Duct (Kokosing)	5,900,000		5,900,000	2,835,833			
05	52	01	2	FGD System Supply	15,628,000		15,628,000	16,010,000			
05	52	02	2	FGD System-Added Permit Items Supply	350,000		350,000	760,613			
05	52	20	2	FGD System Controls	-		-	-			
05	52	21	2	CEMs System Supply	265,000		265,000	337,464			
05	52	22	2	CEMs for PM System Supply	200,000		200,000	-			
05	52	40	4	FGD System Installation (Bowen)	11,000,000		11,000,000	12,825,000			
05	52	41	4	Supply & Install Stack	921,000		921,000	1,052,527			

Gateway Capital Cost Projection Summary Report
Project # 772-07-0001
December 2009 - Projections and Spending & Commitments

Proposed Pollution Control Equipment Allocations Per SunCoke Energy Engineering & Technology Group and Project Controls

WBS				Area Description	Original Budget	Approved Revisions	Current Budget	Estimate at Completion	Allocation %	Allocation Amount ($)	Comment
				Plant Electrical							
08	81	20	2	Power Distribution Main	1,436,000		1,436,000	2,525,000			
08	81	40	4	Power Distribution Sub	2,346,000		2,346,000	2,430,000			
08	81	41	4	Duct Bank Civil	400,000		400,000	400,000			
				Substation Material				345			
08	82	40	4	New Substation	1,885,000		1,885,000	375,000			
08	86	40	4	Area Lighting	-		-	-			
08 Total				Plant Electrical	6,067,000	-	6,067,000	5,731,345	10%	$573,135	
				Plant Utilities							
09	91	20	2	Plant & Instrument Air System	100,000		100,000	225,978	10%	$22,598	Infrastructure allocation
09	91	40	4	Air System Installation	345,000		345,000	345,000	10%	$34,500	" "
09	92	21	2	Service Water Tank Supply	570,000		570,000	638,000			
09	92	22	2	Eye Wash Stations	55,000		55,000	73,943			
09	92	40	4	Service & Firewater System	820,000		820,000	876,270			
09	94	40	4	Potable Water System	300,000		300,000	300,000			
09	95	40	4	Natural Gas System	175,000		175,000	175,000			
09	96	40	4	Storm Water System & Other	[illegible]		1,200,000	[illegible]	100%	$1,200,000	
09	98	40	4	Sanitary Sewer System	[illegible]		275,000	[illegible]	100%	$315,000	
09 Total				Plant Utilities	3,840,000	-	3,840,000	4,149,191			
				Total Direct Costs	**247,075,000**	**888**	**247,075,888**	**261,977,156**			
11	01	00	5	Coke Plant Indirects (Contractor Indirects)	-		-	-			
11	02	01	5	Utilities Relocation	2,525,000		2,525,000	2,590,104			
11	02	02	5	Steam Line Relocation (by USS) & B/C's	1,100,000		1,100,000	1,000,000			
11	03	01	5	Engineering & Design - IEA	3,400,000		3,400,000	4,100,000			
11	03	02	5	Engineering & Design - Ramsey	2,000,000		2,000,000	2,000,000			
11	03	03	5	Engineering & Design - Kokosing	400,000		400,000	400,000			
11	03	04	5	Engineering & Design - Other	385,000		385,000	165,611			
11	03	05	5	Construction Management - IEA	870,000		870,000	870,000			
11	03	06	5	Start-Up, Training, Testing	-		-	-			
11	04	01	5	Capital Spares & Mobile Equipment	2,500,000	-	2,500,000	2,500,000			
11	05	01	1	S/C Team- Labor	2,800,000		2,800,000	3,000,000			
11	05	02	5	S/C Office & Admin, IT Expenses	500,000		500,000	576,301			
11	05	03	5	S/C Team- Expenses	400,000		400,000	500,000			
11	05	04	5	S/C Team-Subcontractor Labor	500,000		500,000	1,046,607			
11	05	05	5	Project Incentives	1,222,000		1,222,000	1,000,000			
11	06	01	5	All Risk Insurance	865,000		865,000	-			
11	00	00	00	Outside Engineer, Proc, Proj & Const Mgt	-		-	18,522			
11 Total				Engineering & Administration	19,467,000	-	19,467,000	19,867,235			
12	01	00	5	Construction Management - IEA	-		-	-			
12	01	02	5	Construction Management & Indirects-Kokosing	10,320,000		10,320,000	10,320,000			
12 Total				Field Indirects	10,320,000	-	10,320,000	10,320,000			
13	01	00	5	Commissioning & Start-Up-IEA	960,000		960,000	1,508,912			
13	02	00	5	Pre- S/U Hazop	-		-				
13 Total				Commissioning & Start-Up	960,000	-	960,000	1,508,912			
14	01	00	5	Kokosing Change Orders	-		-	3,195,443	10%	$319,544	Evaluation of HRSG, FGD, Pollution-related CO's.
14	02	00	5	IEA Change Orders	-		-	0			
14	03	00	5	Guarantee Change Orders	-		-	2,176,235	10%	$217,624	Evaluation of HRSG, FGD, Pollution-related CO's.
14	04	00	5	Aker Kvaener Change Orders	-		-	3,187,714	5%	$159,386	Evaluation of HRSG, FGD, Pollution-related CO's.
14	05	00	5	Nooter Change Orders	-		-	0			
14	06	00	5	Hamon Change Orders	-		-	133,014	100%	$133,014	Evaluation of HRSG, FGD, Pollution-related CO's.
14	07	00	5	Peters Change Orders	-		-	223,794			
14	08	00	5	Other Change Orders & Backcharges	-		-				
14	09	00	5	Tri-Cities Port warehouse storage	-		-	275,500			
14	10	00	5	Shively Civil & Refractory testing	-		-	250,000			
14	11	00	5	Land Purchase /Easements	-		-	355,000			
14	12	00	5	Castable Re-work Costs	-		-	2,158			
14	13	00	5	Baumeyer Pipe Installation	-		-	67,200			
14	14	00	5	Stein Steel Mill (backfill)	-		-	125,000			
14	15	00	5	Icon Mechanical CO	-		-	1,706,376	50%	$853,188	Evaluation of HRSG, FGD, Pollution-related CO's.
14	16	00	5	Ameren IP Additional Work to substation	-		-	129,635			
14	17	00	5	Wright Industrial Change Orders	-		-	1,054,391	10%	$105,439	Evaluation of HRSG, FGD, Pollution-related CO's.
14	18	00	5	Bi-State Insulation Change Orders	-		-	310,182	90%	$279,164	Evaluation of HRSG, FGD, Pollution-related CO's.
14	19	00	5	Bowen Engineering Change Orders				245,034	100%	$245,034	Evaluation of HRSG, FGD, Pollution-related CO's.
14	20	00	5	Crown Change Orders				34,690	10%	$3,469	Evaluation of HRSG, FGD, Pollution-related CO's.
14	21	00	5	Anticipated Backcharge Recovery				(200,000)	50%	-$100,000	Anticipated Hamon & Nooter recovery
14	xx	00	5	Anticipated Negotiated Change Order Reductions				(1,400,000)	25%	-$350,000	Primarily a portion of anticipated Icon, BI States recov
14 Total				Change Orders & Backcharges	-	-	-	11,871,356			
18	01	00	5	Pre-Project Capital - AFE 772-060001	1,050,000		1,050,000	941,755			
18	02	00			-		-				
18 Total				Previous Years Total	1,050,000	-	1,050,000	941,755			
19	01	00	00	Escalation	-		-				
19	01	01	05	Contingency	9,181,000		9,181,000	-			
xx	xx	xx	x1	2008 Month-End Accruals				-			
xx	xx	x1	x2	Scrap Metal				(7,995)			
xx	xx	x2	x2	Misc Credits				(79,663)			
19 Total				Contingency	9,181,000	-	9,181,000	(87,658)	10%	-$8,766	
Grand Total					**288,053,000**	**888**	**288,053,888**	**306,398,766**			

$3,677,153 - Water Pollution Control Facilities Cost*
$124,544,186 - Air Pollution Control Facilities Cost*

$128,221,339 Total Pollution Control Equipment Cost

CLS 12/8/09

* Air and water pollution control facilities costs are assumed to be 50% real property and 50% personal property (see application sections E(5)(a) and (e)).

Color Legend

- Direct Pollution Control Equipment Expense - 75% to 100%
- Partial Pollution Control Expense - 5% to 10%
- Partial Pollution Control Expense - 15% to 20%
- Pollution Control Allocation to Project Change Order Costs - percentage varies
- Water Pollution Control Facility Cost

Notes:

1) Pollution control equipement includes all direct costs (but excludes allocable indirect costs, as they are not part of the taxable base) as indicated in the spreadsheet for the Flue Gas Desulfurization equipment, heat recovery steam generation systems, storm and sanitary sewer expense, and machinery and equipment associated with the negative pressure system employed by SunCoke Energy's ovens (pulling of air into the oven through air ports on each door and sole flues).

2) In the heat recovery ovens being constructed, all the gases driven off of the coal are completely combusted within the oven. The combusted gases move to heat recovery steam generators, where the

11	02	01	5	Utilities Relocation	2,525,000		2,525,000	2,550,194			
11	02	02	5	Steam Line Relocation (by USS) & E/C's	1,100,000		1,100,000	1,000,000			
11	03	01	5	Engineering & Design - IEA	3,400,000		3,400,000	4,100,000			
11	03	02	5	Engineering & Design - Ramsey	2,000,000		2,000,000	2,000,000			
11	03	03	5	Engineering & Design - Kokosing	400,000		400,000	400,000			
11	03	04	5	Engineering & Design - Other	385,000		385,000	185,611			
11	03	05	5	Construction Management - IEA	670,000		670,000	670,000			
11	03	00	5	Start-Up, Training, Testing	-		-	-			
11	04	01	5	Capital Spares & Mobile Equipment	2,500,000	-	2,500,000	2,500,000			
11	05	01	1	S/C Team- Labor	2,800,000		2,800,000	3,000,000			
11	05	02	5	S/C Office & Admin, IT Expenses	500,000		500,000	576,301			
11	05	03	5	S/C Team- Expenses	400,000		400,000	500,000			
11	05	04	5	S/C Team-Subcontractor Labor	500,000		500,000	1,046,607			
11	05	05	5	Project Incentives	1,222,000		1,222,000	1,000,000			
11	06	01	5	All Risk Insurance	805,000		805,000	-			
11	00	00	00	Outside Engineer, Proc, Proj & Const Mgt	-		-	18,522			
11 Total				Engineering & Administration	19,467,000	-	19,467,000	19,867,235			
12	01	00	5	Construction Management - IEA			-	-			
12	01	02	5	Construction Management & Indirects-Kokosing	10,320,000		10,320,000	10,320,000			
12 Total				Field Indirects	10,320,000	-	10,320,000	10,320,000			
13	01	00	5	Commissioning & Start-Up-IEA	960,000		960,000	1,508,912			
13	02	00	5	Pre- SAI Hazop			-	-			
13 Total				Commissioning & Start-Up	960,000	-	960,000	1,508,912			
14	01	00	5	Kokosing Change Orders	-		-	3,199,443	10%	$319,544	Evaluation of HRSG, FGD, Pollution-related CO's.
14	02	00	5	IEA Change Orders	-		-	0			
14	03	00	5	Guarantee Change Orders	-		-	2,176,235	10%	$217,624	Evaluation of HRSG, FGD, Pollution-related CO's.
14	04	00	5	Aker Kvaerner Change Orders	-		-	3,187,714	5%	$159,386	Evaluation of HRSG, FGD, Pollution-related CO's.
14	05	00	5	Nooter Change Orders	-		-	0			
14	06	00	5	Hamon Change Orders	-		-	133,014	100%	$133,014	Evaluation of HRSG, FGD, Pollution-related CO's.
14	07	00	5	Peters Change Orders	-		-	223,794			
14	08	00	5	Other Change Orders & Backcharges	-		-	-			
14	09	00	5	Tri-Cities Port warehouse storage	-		-	275,500			
14	10	00	5	Shively Civil & Refractory testing	-		-	250,000			
14	11	00	5	Land Purchase /Easements	-		-	355,000			
14	12	00	5	Castable Re-work Costs	-		-	2,158			
14	13	00	5	Baumeyer Pipe Installation	-		-	67,200			
14	14	00	5	Stein Steel Mill (backfill)	-		-	125,000			
14	15	00	5	Icon Mechanical CO	-		-	1,700,375	50%	$853,188	Evaluation of HRSG, FGD, Pollution-related CO's.
14	16	00	5	Ameren IP Additional Work to substation	-		-	129,635			
14	17	00	5	Wright Industrial Change Orders	-		-	1,054,391	10%	$105,439	Evaluation of HRSG, FGD, Pollution-related CO's.
14	18	00	5	BI-State Insulation Change Orders	-		-	310,182	90%	$279,164	Evaluation of HRSG, FGD, Pollution-related CO's.
14	19	00	5	Bowen Engineering Change Orders				245,034	100%	$245,034	Evaluation of HRSG, FGD, Pollution-related CO's.
14	20	00	5	Crown Change Orders				34,690	10%	$3,469	Evaluation of HRSG, FGD, Pollution-related CO's.
14	21	00	5	Anticipated Backcharge Recovery				(200,000)	50%	-$100,000	Anticipated Hamon & Nooter recovery
14	xx	00	5	Anticipated Negotiated Change Order Reductions				(1,400,000)	25%	-$350,000	Primarily a portion of anticipated Icon, Bi States recov
14 Total				Change Orders & Backcharges	-	-	-	11,871,364			
18	01	00	5	Pre-Project Capital - AFE 772-060001	1,050,000		1,050,000	941,755			
18	02	00			-		-	-			
18 Total				Previous Years Total	1,050,000	-	1,050,000	941,755			
19	01	00	60	Escalation	-		-	-			
19	01	01	05	Contingency	9,181,000		9,181,000	-			
xx	xx	xx	x1	2008 Month-End Accruals				-			
xx	xx	x1	x2	Scrap Metal				(7,595)			
xx	xx	x2	x2	Misc Credits				(79,663)			
19 Total				Contingency	- 9,181,000	-	9,181,000	(87,658)	10%	-$8,766	
Grand Total					288,053,000	888	288,053,888	306,398,766			

$3,677,153 - Water Pollution Control Facilities Cost*
$124,544,186 - Air Pollution Control Facilities Cost*
$128,221,339 Total Pollution Control Equipment Cost

CLS 12/8/09

* Air and water pollution control facilities costs are assumed to be 50% real property and 50% personal property (see application sections E(5)(a) and (e)).

Color Legend:
- Direct Pollution Control Equipment Expense - 75% to 100%
- Partial Pollution Control Expense - 5% to 10%
- Partial Pollution Control Expense - 15% to 20%
- Pollution Control Allocation to Project Change Order Costs - percentage varies
- Water Pollution Control Facility Cost

Notes:

1) Pollution control equipment includes all direct costs (but excludes allocable indirect costs, as they are not part of the taxable base) as indicated in the spreadsheet for the Flue Gas Desulfurization equipment, heat recovery steam generation systems, storm and sanitary sewer expense, and machinery and equipment associated with the negative pressure system employed by SunCoke Energy's ovens (pulling of air into the oven through air ports on each door and sole flues).

2) In the heat recovery ovens being constructed, all the gases driven off of the coal are completely combusted within the oven. The combusted gases move to heat recovery steam generators, where the waste heat produces steam for power generation. These ovens have been designed, built and will be operated to conform to EPA maximum achievable control technology (MACT) emission standards.

3) The qualifying pollution control facilities include all of the costs for the Flue Gas Desulfurization (FGD) system. The FGD's SO2 scrubbers treat the combusted flue gas from the coke ovens utilizing a lime slurry, to form calcium sulfate. The flue gas with entrained calcium sulfate passes through the baghouse containing thousands of 6" diameter 30 ft long bags. As the gas passes through the filter bags, the calcium sulfate particulates (about 5000 pounds per hour) are filtered out, collected in a silo and then transported off site for disposal.

4) In addition to the pollution control expenses indicated in paragraphs 1), 2) and 3) above, portions of the coal and coke handling equipment (10 to 15 percent, excluding allocable indirect costs) have also been included as the estimated proportional costs of such facilities for the pollution control components of those systems. The specified equipment is used or intended primarily for eliminating, preventing or reducing air or water pollution, or treating, or disposing of any solid, liquid or gaseous pollutant which if released without such treatment, pretreatment, modification or disposal might be harmful, detrimental or offensive to human, plant or animal life, or to property (Ill. Admin. Code 130.1951(i)).

217/782-2113

CONSTRUCTION PERMIT - PSD APPROVAL
NESHAP SOURCE - NSPS SOURCE

PERMITTEE

Gateway Energy & Coke Company, LLC
c/o SunCoke Company
Attn: Delauna Pack
Parkside Plaza
11400 Parkside Drive
Knoxville, Tennessee 37934

Application No.: 06070020
Applicant's Designation:
Subject: Heat Recovery Coke Plant
Date Issued: March 13, 2008
Location: Edwardsville Road, Granite City

I.D. No.: 119040ATN
Date Received: July 11, 2006

This Permit is hereby granted to the above-designated Permittee to CONSTRUCT emission source(s) and/or air pollution control equipment consisting of a heat recovery coke plant, as described in the above-referenced application. This Permit is subject to standard conditions attached hereto and the following special condition(s):

In conjunction with this permit, approval is given with respect to the federal regulations for Prevention of Significant Deterioration of Air Quality (PSD) for the above referenced project, as described in the application, in that the Illinois Environmental Protection Agency (Illinois EPA) finds that the application fulfills all applicable requirements of 40 CFR 52.21. This approval is issued pursuant to the federal Clean Air Act, as amended, 42 U.S.C. 7401 et. seq., the federal regulations promulgated thereunder at 40 CFR 52.21 for Prevention of Significant Deterioration of Air Quality (PSD), and a Delegation of Authority agreement between the United States Environmental Protection Agency and the Illinois EPA for the administration of the PSD Program. This approval becomes effective in accordance with the provisions of 40 CFR 124.15 and may be appealed in accordance with the provisions of 40 CFR 124.19. This approval is also based upon and subject to the findings and conditions which follow:

If you have any questions on this permit, please contact Jason Schnepp at 217/782-2113.

Edwin C. Bakowski, P.E.
Acting Manager, Permit Section
Division of Air Pollution Control

Date Signed: _____

ECB:JMS:jws

cc: Region 3
Lotus Notes
CES

TABLE OF CONTENTS

1.0 LIST OF ABBREVIATIONS AND ACRONYMS COMMONLY USED

BACT	Best Available Control Technology
CAAPP	Clean Air Act Permit Program
CFR	Code of Federal Regulations
CO	Carbon Monoxide
dscm	Dry Standard Cubic Meters
dscf	Dry Standard Cubic Feet
F	Fahrenheit
gr	Grains
H_2SO_4	Sulfuric Acid
HAP	Hazardous Air Pollutant
hr	Hour
HRSG	Heat Recovery Steam Generator
IAC	Illinois Administrative Code
I.D. No.	Identification Number of Source, assigned by Illinois EPA
Illinois EPA	Illinois Environmental Protection Agency
LAER	Lowest Achievable Emission Rate
lb	Pound
mg	Milligram
mo	Month
mmBtu	Million British Thermal Units
MSSCAM	Major Stationary Sources Construction and Modification (35 Part IAC 203), also known as Nonattainment New Source Review (NA NSR)
NESHAP	National Emission Standards for Hazardous Air Pollutants
NO_x	Nitrogen Oxides
NSPS	New Source Performance Standards
PM	Particulate Matter
PM_{10}	Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 microns as would be measured by applicable testing or monitoring methods
$PM_{2.5}$	Particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 microns as would be measured by applicable testing or monitoring methods
PSD	Prevention of Significant Deterioration (40 CFR 52.21)
scf	Standard Cubic Feet
scm	Standard Cubic Meter
SO_2	Sulfur Dioxide
USEPA	United States Environmental Protection Agency
VOM	Volatile Organic Material
Yr	Year

2.0 FINDINGS

2.1 a. SunCoke, which owns Gateway Energy & Coke Company, LLC (Gateway), has applied for a permit for a heat recovery coke plant. The proposed Gateway plant will consist of 120 heat recovery coke ovens. The coke plant would have the capability of processing 1.1 million tons of coal per year and produce up to 740,000 tons of furnace coke per year. The coke would be used at the neighboring United States Steel (USS) - Granite City Works in the production of iron or sold and transported to other locations. Ancillary operations include coke crushing and screening, coal/coke handling and processing, and material storage. The plant also would recover the waste heat to produce steam for the Granite City Works.

b. USS, under a separate application (Application Number 06070088), has applied for a coke conveyance project. This project would involve a conveyor system to transfer coke from Gateway to USS and other ancillary equipment for handling of this coke at the Granite City Works.

c. For purposes of applicability of New Source Review regulations, the combination of Gateway's coke plant project and the USS coke conveyance project is considered to be a single overall project that is occurring at the Granite City Works. Among other things, this is because USS and Gateway are working together in the planning and development of the proposed coke plant, which would be built on property currently owned by USS and be constructed and operated to supply coke to USS pursuant to a long-term contract.

2.2 Gateway is located in an area designated nonattainment for ozone and $PM_{2.5}$. For purposes of nonattainment New Source Review (NA NSR) regulations, PM_{10} serves as a surrogate for $PM_{2.5}$, consistent with current USEPA guidance.

2.3 a. The project, i.e., the combination of the heat recovery coke plant and the coke conveyance system, is subject to 35 IAC 203: Major Stationary Sources Construction and Modification (MSSCAM) for $PM_{2.5}$. This is because the net emissions increase for the project exceeds 15 tons per year of $PM_{2.5}$, as summarized in Attachment 2.

b. i. This project is subject to PSD review as a major modification for PM and PM_{10} emissions. This is because the net emissions increase for the project exceeds 15 tons per year of PM_{10}, as summarized in Attachment 2.

ii. This project would not result in a significant increase in emissions of other PSD pollutants or non-attainment pollutants as summarized in Attachment 2.

2.4 After reviewing all the materials submitted by Gateway, the Illinois EPA has determined that the application for the heat recovery coke plant, as proposed, shows (i) compliance with all applicable state and federal emission standards, (ii) utilization of Best Available Control Technology (BACT) for emissions of PM and PM_{10}, and (iii) the Lowest Achievable Emission Rate (LAER) for emissions of $PM_{2.5}$.

2.5 The air quality analysis submitted for the overall project and reviewed by the Illinois EPA shows that the proposed project will not cause violations of the ambient air quality standards for PM_{10}.

2.6 Gateway and USS must obtain offsets for this project from existing sources in the St. Louis/Metro-East nonattainment area. Based on the permitted PM_{10} emissions of the overall project, 234.09 tons/year, at least 235 tons of PM_{10} emission offsets must be provided for this provided for this overall project; however, note US Steel and Gateway have agreed to provide 267.77 tons of emission offsets as originally proposed.

2.7 The Illinois EPA has considered alternatives to this project, as required by 35 IAC 203.306.

2.8 Pursuant to 35 IAC 203.305, US Steel has demonstrated that all major stationary sources which it owns or operates in Illinois are in compliance or on a schedule for compliance with all applicable state and federal air pollution control requirements. (Refer to Construction Permit 06070088, issued to US Steel for the Coke Conveyance System).

Note: SunCoke has stated that it does not own or operate any major sources in Illinois.

2.9 The Illinois EPA has determined that the application for the heat recovery coke plant, as proposed, shows that it would comply with all applicable Illinois Air Pollution Control Board Regulations and the federal Prevention of Significant Deterioration of Air Quality Regulations (PSD), 40 CFR 52.21.

2.10 A copy of the applications and the Illinois EPA's review of the applications and a draft of the permits were forwarded to a location in the vicinity of the plant, and the public was given notice and opportunity to examine this material, to submit comments, and to request and participate in a public hearing on this matter.

The Illinois EPA is issuing approval to construct the proposed heat recovery coke plant subject to the following conditions and consistent with the specifications and data included in the application. Any significant departure from terms expressed in the application would need to receive prior written authorization of the Illinois EPA.

3.0 GENERAL CONDITIONS

3.1 General Applicable Provisions and Regulations

3.1.1 Specific emission units at this plant are subject to particular regulations as set forth in Section 4 (Unit-Specific Conditions for Specific Emission Units) of this permit.

3.1.2 In addition, except as otherwise specified, emission units at this plant are subject to the following regulations of general applicability:

a. No person shall cause or allow the emission of fugitive particulate matter from any process, including any material handling or storage activity, that is visible by an observer looking generally overhead at a point beyond the property line of the source unless the wind speed is greater than 40.2 kilometers per hour (25 miles per hour), pursuant to 35 IAC 212.301 and 212.314.

b. Pursuant to 35 IAC 212.123(a), no person shall cause or allow the emission of smoke or other particulate matter, with an opacity greater than 30 percent, into the atmosphere from any emission unit other than those emission units subject to the requirements of 35 IAC 212.122, except as allowed by 35 IAC 212.123(b) and 212.124.

c. No person shall cause or allow emissions of particulate matter (as filterable PM, as would be measured in accordance with 35 IAC 212.108), other than that of fugitive particulate matter, into the atmosphere to exceed the following limits during any one hour period: 22.9 mg/scm (0.01 gr/scf) from any process emissions unit located at integrated iron and steel plants in the vicinity of Granite City, as defined in 35 IAC 212.324(a)(1)(C), except as otherwise provided in 35 IAC 212.458 or in 35 IAC 212.443 and 212.446 [35 IAC 212.458(b)(7)].

3.1.3 Emissions Offsets

a. Gateway and USS shall maintain 267.77 tons of PM_{10} emission offsets generated by the following activities/projects:

Activity/Project	(Tons/Year)
COG Desulfurization Project	31.74[a]
Road Cleaning Program[b]	236.03[b]
Total:	267.77

[a] The COG desulfurization project (excluding Boilers 1-10 shutdown and Slab Furnaces) results in a contemporaneous PM/PM_{10} emission decrease of 94.15 tons, as further addressed in Construction Permit

06070022. Only a portion of this decrease, 31.74 tons, is being relied upon for use as an offset. This portion of the decrease is no longer available for future netting transactions.

b. The specific requirements for the Road Cleaning Program are contained in Condition 3.6 of Construction Permit 06070088.

b. i. These emission reduction credits are provided by emission reductions occurring at the source (the Coke Oven Gas Desulfurization Project) and by emission reductions occurring in the vicinity of the source (the Road Cleaning Program, as addressed in Condition 3.6 of Construction Permit 06070088). The emission reductions have been relied upon by the Illinois EPA to issue the permits for this project and cannot be used as emission reduction credits for other purposes. The reductions have been made enforceable by this permit, Construction Permit 06070088, which addresses the coke conveyance system, and Construction Permit 06070022 which requires certain decreases in emissions in conjunction with the construction and operation of a coke oven gas desulfurization system for the existing by-product coke plant at USS.

ii. If the Permittee proposes to rely upon emission offsets from other sources or other activities/projects, the Permittee shall apply for and obtain a revision to this permit prior to relying on such emission offsets, which application shall be accompanied by detailed documentation for the nature and amount of those alternative emission offsets.

c. The implementation of measures to provide emission offsets shall begin prior to startup of the new heat recovery coke plant.

Condition 3.1.3 represents the actions identified in conjunction with this project to ensure that the project is accompanied by emission offsets and does not interfere with reasonable further progress for $PM_{2.5}$.

3.2 General Non-Applicability of Regulations of Concern

3.2.1 PSD/NAA NSR

a. The Permittee has addressed the applicability of 40 CFR 52.21, PSD and 35 IAC Part 203, Major Stationary Sources Construction and Modification (MSSCAM). The limits established by this permit are intended to ensure that the

heat recovery coke plant addressed in this construction permit does not constitute a major modification of the source pursuant to these rules for NO_x, CO, VOM, SO_2, and H_2SO_4 emissions (See also Attachments 1 and 2).

3.3 General Work Practice Requirements

3.3.1 Operating Program

a. Pursuant to 35 IAC 212.309, emission units at the plant that are subject to a requirement in 35 IAC 212.304 through 212.308 or 212.316 shall be operated under the provisions of an operating program, consistent with the requirements set forth in 35 IAC 212.310 and 212.312, and prepared by the Permittee and submitted to the Illinois EPA for its review. Such operating program shall be designed to significantly reduce fugitive particulate matter emissions.

i. As a minimum the operating program shall include the information and elements specified by 35 IAC 212.310, including: (1) a detailed description of the best management practices utilized to control fugitive dust; (2) estimated frequency of application of dust suppressants by location; and (3) such other information as may be necessary to facilitate the Illinois EPA's review of the operating program.

ii. This program shall also identify the specific control measures as may be needed to ensure that certain emission units comply with the opacity limits of 35 IAC 212.316.

iii. Pursuant to 35 IAC 212.312, this operating program shall be amended from time to time by the Permittee so that the operating program is current. Such amendments shall be consistent with 35 IAC Part 212 Subpart K and shall be submitted to the Illinois EPA for its review.

3.4 General Recordkeeping Requirements

3.4.1 Retention and Availability of Records

a. All records and logs required by this permit shall be retained for at least five years from the date of entry (unless a longer retention period is specified by the particular recordkeeping provision herein), shall be kept at a location at the source that is readily accessible to the Illinois EPA or USEPA, and shall be made available for inspection and copying by the Illinois EPA or USEPA upon request.

b. The Permittee shall retrieve and print, on paper during normal source office hours, any records retained in an electronic format (e.g., computer) in response to an Illinois EPA or USEPA request for records during the course of a source inspection.

3.5 General Reporting Requirements

3.5.1 Reporting and Notifications Associated with Emissions Tests

a. The Illinois EPA shall be notified prior to required emissions tests to enable the Illinois EPA to observe these tests. Notification of the expected date of testing shall be submitted a minimum of 30 days prior to the expected date. Notification of the actual date and expected time of testing shall be submitted a minimum of 5 working days prior to the actual date of the test. The Illinois EPA may at its discretion accept notifications with shorter advance notice provided that the Illinois EPA will not accept such notifications if it interferes with the Illinois EPA's ability to observe testing.

b. At least 60 days prior to the actual date of required emissions testing, a written test plan shall be submitted to the Illinois EPA for review. This plan shall describe the specific procedures for testing, including as a minimum:

i. The person(s) who will be performing sampling and analysis and their experience with similar tests.

ii. The specific conditions under which testing will be performed, including a discussion of why these conditions will be representative of maximum emissions and the means by which the operating parameters for the emission unit and any control equipment will be determined.

iii. The specific determinations of emissions and operation, which are intended to be made, including sampling and monitoring locations.

iv. The test method(s) that will be used, with the specific analysis method, if the method can be used with different analysis methods.

v. Any minor changes in standard methodology proposed to accommodate the specific circumstances of testing, with justification.

c. Copies of the Final Reports(s) for required emissions tests shall be submitted to the Illinois EPA within 30 days after

the test results are compiled and finalized. The Final Report shall include as a minimum:

i. A summary of results.

ii. General information.

iii. Description of test method(s), including description of sample points sampling train, analysis equipment, and test schedule.

iv. Detailed description of test conditions, including:

A. Process information.

B. Control equipment information, e.g., equipment condition and operating parameters during testing.

v. Data and calculations, including copies of all raw data sheets, opacity observation records and records of laboratory analyses, sample calculations, and data on equipment calibration.

3.5.2 Notification and Reporting of Deviations

a. Except as specified in a particular provision of this permit or in a subsequent CAAPP Permit for the plant; notifications and reports for deviation from applicable emission standards and control requirements shall include at least the following information: the date and time of the event, a description of the event, information on the magnitude of the deviation, a description of the corrective measures taken, and a description of any preventative measures taken to prevent future occurrences.

3.6 Authorization to Operate

a. The emission units addressed by this construction permit may be operated under this permit until issuance of the source's CAAPP permit, provided a timely and complete CAAPP permit application has been submitted.

Note: Although the proposed Gateway plant is considered a single source with US Steel Corporation - Granite City Works (I.D. No. 119813AAI), for purposes of the Clean Air Act Permit Program (CAAPP), the plant will have a different responsible official, and will be covered by a separate CAAPP permit than USS.

b. The Permittee must submit its complete CAAPP application for the coke plant within 12 months after commencing operation of the plant, pursuant to Section 39.5(5)(x) of the Act.

4.0 UNIT SPECIFIC CONDITIONS FOR SPECIFIC EMISSION UNITS

4.1 Coke Oven Batteries

4.1.1 Description

The new coke oven batteries will be heat recovery type. The plant will consist of 120 ovens arranged in three 40-oven batteries. The ovens are the horizontal type and measure approximately 10 feet tall and 50 long.

The coke production cycle begins when a machine (pushing/charging machine) opens the door to the charging side of the oven and charges the oven with coal. Heat from the refractory starts the coking cycle. Heat recovery ovens are kept at negative pressure, with air being introduced into the oven to oxidize volatile matter and release the heat of combustion within the oven chamber. Partially combusted gases pass into a flue system beneath the oven floor where further combustion occurs. The gases then pass into an afterburner tunnel where combustion is completed. The afterburner tunnel system routes the hot gases to the heat recovery steam generators (HRSG). When the conversion from coal to coke is complete, the coke is pushed out of the oven and onto a mobile flat hot receiving or push car. This push car transports the hot coke to the quench tower where the coke is cooled with a water spray.

Particulate emissions occur when the coal is charged into the oven via the pushing/charging machine. These emissions are captured by a traveling hood/baghouse system on the pushing/charging machine. Because the ovens are operated at negative pressure, leaks of coke oven gases will not occur during the coking process, as may occur with conventional byproduct recovery ovens. After coking is complete, particulate emissions occur when the mass of hot coke is pushed from the oven onto the push car. These emissions are captured and controlled by a capture system and multicyclone on the push car. Particulate emissions occur when the hot coke is quenched in the quench tower. These emissions are controlled by a baffle system in the tower and by maintaining a low total dissolved solids content in the quench water.

In addition to recovering the thermal energy in the hot gas stream from the afterburner tunnels, the heat recovery steam generators cool the gas stream, preparing the stream for removal of sulfur dioxide (SO_2) and particulate. These are controlled by a spray dryer with lime injection followed by a fabric filter baghouse. Lime and water (calcium hydroxide slurry) are introduced into the spray dryer tower, where they mix with the gas, dry, and react with SO_2 to form $CaSO_3$ and $CaSO_4$. The baghouse downstream of the spray dryer removes entrained ash,

$CaSO_3$, $CaSO_4$, and unreacted lime. Carbon injection will be used to control gaseous mercury. The carbon will be injected into the gas stream upstream of the spray dryer absorber. The carbon with the mercury is then collected in the baghouse.

As described above, in the normal operating mode of the coke oven batteries, all the exhaust from the ovens go through the afterburner tunnel system, to heat recovery steam generators and then to the spray dryer/fabric filter system, before being discharged to the atmosphere via the main stack. Periodically, the heat recovery steam generators require inspection and maintenance. During this time, the portion of the afterburner tunnel associated with that heat recovery steam generator, each of which serves 20 ovens, will vent directly to atmosphere through one of the individual waste heat stacks.

4.1.2 List of Emission Units and Air Pollution Control Equipment

Emission Unit	Description	Emission Control
Coke Oven Processes		
Charging	Coal is added to the oven.	Traveling Hood and Baghouse System
Doors	A door is located on either end of the oven for adding coal and removing coke.	Work Practices Including Negative Pressure Design
Pushing	Coke is pushed out of the oven.	Traveling Hood and Multicyclone System
Main Stack	Primary disposition of gases generated during the coking process.	Afterburner Tunnels and Spray Dryer Absorber and Fabric Filter System with Carbon Injection
Individual Waste Heat Stacks	Alternative disposition of some or all of the coking gases during periodic inspection and necessary maintenance of one of the six heat recovery steam generators (HRSG) or the spray dryer absorber/filter system.	Afterburner Tunnel
Quenching	Water is sprayed onto the hot coke for the purpose of cooling.	Water Quality and Baffles

4.1.3 Applicable Provisions and Regulations

a. The "affected units" for the purpose of these unit-specific conditions, are the units described in Conditions 4.1.1 and 4.1.2.

4.1.3-1 Applicable Federal Standards (40 CFR 63, Subpart L)

Certain affected units are subject to the NESHAP for Coke Oven Batteries, 40 CFR 63 Subpart L and requirements of the General Provisions of the NESHAP, 40 CFR 63, Subpart A. The Permittee shall comply with all applicable requirements of 40 CFR Part 63 Subparts A and L. In particular, this standard applies to coke oven doors and charging. These types of coke oven batteries do not have topside port lids, offtake system(s), bypass/bleeder stacks, or collecting mains, which are also addressed by this regulation.

a. Doors

i. The owner or operator shall monitor and record, once per day for each day of operation, the pressure in each oven or in a common battery tunnel to ensure that the ovens are operated under a negative pressure [40 CFR 63.303(b)(1)(ii)].

b. Charging

i. For charging operations, the owner or operator shall install, operate, and maintain an emission control system for the capture and collection of emissions in a manner consistent with good air pollution control practices for minimizing emissions from the charging operation [40 CFR 63.303(b)(2)].

ii. For charging operations, the owner or operator shall implement, for each day of operation, the work practices specified in 40 CFR 63.306(b)(6) and record the performance of the work practices as required in 40 CFR 63.306(b)(7) [40 CFR 63.303(b)(3)].

c. Work Practices

i. The owner or operator shall observe each coke oven door after charging and record the oven number of any door from which visible emissions occur. Emissions from coal spilled during charging or from material trapped within the seal area of the door are not considered to be a door leak if the owner or operator demonstrates that the oven is under negative pressure, and that no emissions are visible from the top of the door or from dampers on the door [40 CFR 63.303(c)(1)].

ii. Except as provided in 40 CFR 63.303(c)(2)(i) (see below), if a coke oven door leak is observed at any time during the coking cycle, the owner or operator shall take corrective action and stop the leak within

15 minutes from the time the leak is first observed. No additional leaks are allowed from doors on that oven for the remainder of that oven's coking cycle [40 CFR 63.303(c)(2)].

A. The owner or operator may take corrective action and stop the leak within 45 minutes (instead of 15 minutes) from the time the leak is first observed for a maximum of two times per battery in any semiannual reporting period [40 CFR 63.303(c)(2)(i)].

iii. The owner or operator shall not discharge or cause to be discharged to the atmosphere from charging operations any fugitive emissions that exhibit an opacity greater than 20 percent, as determined by the procedures in 40 CFR 63.309(j) [40 CFR 63.303(d)(1)].

iv. The owner or operator shall not discharge or cause to be discharged to the atmosphere any emissions of particulate matter (PM) from a charging emissions control device that exceed 0.0081 pounds per ton (lbs/ton) of dry coal charged, as determined by the procedures in 40 CFR 63.309(k) [40 CFR 63.303(d)(2)].

v. The owner or operator shall observe the exhaust stack of each charging emissions control device at least once each day of operation during charging to determine if visible emissions are present and shall record the results of each daily observation or the reason why conditions did not permit a daily observation. If any visible emissions are observed, the owner or operator shall:

A. Take corrective action to eliminate the presence of visible emissions [40 CFR 63.303(d)(3)(i)];

B. Record the cause of the problem creating the visible emissions and the corrective action taken [40 CFR 63.303(d)(3)(ii)];

C. Conduct visible emission observations according to the procedures in 40 CFR 63.309(m) within 24 hours after detecting the visible emissions [40 CFR 63.303(d)(3)(iii)]; and

D. Report any 6-minute average, as determined according to the procedures in 40 CFR 63.309(m), that exceeds 10 percent opacity as a

deviation in the semiannual compliance report required by 40 CFR 63.311(d) [40 CFR 63.303(d)(3)(iv)].

vi. The owner or operator shall develop and implement written procedures for adjusting the oven uptake damper to maximize oven draft during charging and for monitoring the oven damper setting during each charge to ensure that the damper is fully open [40 CFR 63.303(d)(4)].

vii. The Permittee shall comply with the work practice standards in 40 CFR 63.306, which require preparation and submittal of a written emission control work practice plan for each coke oven battery.

d. Requirements for Startups, Shutdowns, and Malfunctions

The Permittee shall comply with the requirements for startups, shutdowns, and malfunctions in 40 CFR 63.310, which at a minimum, shall include a written startup, shutdown, and malfunction plan.

4.1.3-2 Applicable Federal Standards (40 CFR 63, Subpart CCCCC)

Certain affected units are subject to the NESHAP for Coke Ovens: Pushing, Quenching, and Battery Stacks, 40 CFR 63 Subpart CCCCC and requirements of the General Provisions of the NESHAP, 40 CFR 63, Subpart A. The Permittee shall comply with all applicable requirements of 40 CFR Part 63 Subparts A and CCCCC. These particular coke oven batteries do not have soaking emissions or battery stacks, which are also addressed by this regulation.

a. Pushing

i. The Permittee shall not discharge to the atmosphere emissions of particulate matter from a control device applied to pushing emissions that exceed 0.04 lb/ton of coke [40 CFR 63.7290(a)(4)].

ii. The Permittee shall meet each operating limit in 40 CFR 60.7290(b)(1) through (4) that applies to you for a new or existing coke oven battery [40 CFR 63.7290(b)].

A. For each capture system applied to pushing emissions, the Permittee shall maintain the daily average volumetric flow rate at the inlet of the control device at or above the minimum level established during the initial performance test [40 CFR 63.7290(b)(3)]; or

1. For each capture system that uses an electric motor to drive the fan, the Permittee shall maintain the daily average fan motor amperes at or above the minimum level established during the initial performance test [40 CFR 63.7290(b)(3)(i)]; and

2. For each capture system that does not use a fan driven by an electric motor, the Permittee shall maintain the daily average static pressure at the inlet to the control device at an equal or greater vacuum than the level established during the initial performance test or maintain the daily average fan revolutions per minute (RPM) at or above the minimum level established during the initial performance test [40 CFR 63.7290(b)(3)(ii)].

B. For each multicyclone, the Permittee shall maintain the daily average pressure drop at or below the minimum level established during the initial performance test [40 CFR 63.7290(b)(4)].

b. Quenching

i. The concentration of total dissolved solids (TDS) in the water used for quenching must not exceed 1,100 milligrams per liter (mg/L) [40 CFR 63.7295(a)(1)(i)];

ii. The Permittee shall use acceptable makeup water, as defined in 40 CFR 63.7352, as makeup water for quenching [40 CFR 63.7295(a)(2)].

iii. A. The Permittee shall equip each quench tower with baffles such that no more than 5 percent of the cross sectional area of the tower may be uncovered or open to the sky [40 CFR 63.7295(b)(1)].

B. The Permittee shall wash the baffles in each quench tower once each day that the tower is used to quench coke, except as specified in 40 CFR 63.7295(b)(2)(i) and (ii) [40 CFR 63.7295(b)(2)].

1. The Permittee is not required to wash the baffles in a quench tower if the highest

measured ambient temperature remains less than 30 degrees Fahrenheit throughout that day (24-hour period). If the measured ambient temperature rises to 30 degrees Fahrenheit or more during the day, you must resume daily washing according to the schedule in your operation and maintenance plan [40 CFR 63.7295(b)(2)(i)].

2. The Permittee shall continuously record the ambient temperature on days that the baffles were not washed [40 CFR 63.7295(b)(2)(ii)].

C. The Permittee shall inspect each quench tower monthly for damaged or missing baffles and blockage [40 CFR 63.7295(b)(3)].

D. The Permittee shall initiate repair or replacement of damaged or missing baffles within 30 days and complete as soon as practicable [40 CFR 63.7295(b)(4)].

c. i. The Permittee shall visually inspect each oven prior to pushing by opening the door damper and observing the bed of coke [40 CFR 63.7293(a)(1)].

ii. The Permittee shall not push the oven unless the visual inspection indicates that there is no smoke in the open space above the coke bed and that there is an unobstructed view of the door on the opposite side of the oven [40 CFR 63.7293(a)(2)].

d. The Permittee shall comply with the applicable operation and maintenance requirements in 40 CFR 63.7300; the general compliance requirements in 40 CFR 63.7310, including the requirement to develop a written startup, shutdown, and malfunction plan according to the provisions in 40 CFR 63.6(e)(3); and the applicable procedures for establishing operating limits in 40 CFR 63.7323.

4.1.3-3 Applicable State Regulations (35 IAC 212.443: Coke Plants)

a. Doors

i. Pursuant to 35 IAC 212.443(d)(1), no person shall cause or allow visible emissions from more than 10 percent of all coke oven doors at any time. The daily pressure readings required by 40 CFR 60.303(b)(1)(ii) may be used to show compliance with this standard, as this state standard is less

stringent than the standard for doors under the NESHAP (zero percent leaks).

b. Charging

Emissions of particulate matter from control equipment used to capture emissions during charging shall not exceed 0.046 g/dscm (0.020 gr/dscf). Testing to determine compliance with this requirement shall be conducted in accordance with the procedures set forth in 40 CFR part 60, Appendix A, Methods 1 through 5 incorporated by reference in 35 IAC 212.113 [35 IAC 212.443(b)(2)(A)].

c. Pushing

i. Uncaptured Emissions

A. Emissions of uncaptured particulate matter from pushing operations shall not exceed an average of 20 percent opacity for 4 consecutive pushes considering the highest average of six consecutive readings in each push. Opacity readings shall be taken at 15-second intervals, beginning from the time the coke falls into the receiving car or is first visible as it emerges from the coke guide whichever occurs earlier, until the receiving car enters the quench tower or quenching device. For a push of less than 90 seconds duration, the actual number of 15-second readings shall be averaged [35 IAC 212.443(c)(1)(A)].

B. Opacity readings shall be taken by a qualified observer located in a position where the oven being pushed, the coke receiving car and the path to the quench tower are visible. The qualified observer shall record opacity readings of emissions originating at the receiving car and associated equipment and the coke oven. Opacity readings shall be taken in accordance with the methods set forth in 40 CFR part 60, Appendix A, Method 9, incorporated by reference in 35 IAC 212.113, except that Section 2.5 for data reduction shall not be used. The qualified observer referenced in this subsection shall be certified pursuant to 40 CFR part 60, Appendix A, Method 9, incorporated by reference in Section 212.113 [35 IAC 212.443(c)(1)(B)].

Note: The requirement to read the opacity as the emissions rise and clear the top of the

coke battery gas main does not apply to these coke oven batteries, as they do not have gas mains.

ii. Emissions from Control Equipment

A. The particulate emissions from control equipment used to control emissions during pushing operations shall not exceed 0.040 pounds per ton of coke pushed. Testing to determine compliance shall be conducted in accordance with the methods set forth in 40 CFR part 60, Appendix A, Methods 1-5, incorporated by reference in 35 IAC 212.113 [35 IAC 212.443(c)(2)(A)] and the procedures specified by the NESHAP (40 CFR 63, Subpart CCCCC).

Note: The NESHAP (40 CFR 63, Subpart CCCCC) has more stringent test procedures, with sampling only during actual pushing operation.

B. The opacity of emissions from control equipment used to control emissions during pushing operations shall not exceed 20%. For a push of less than six minutes duration, the actual number of 15-second readings taken shall be averaged. Compliance shall be determined in accordance with 40 CFR part 60, Appendix A, Method 9, incorporated by reference in 35 IAC 212.113 provide however that Section 2.5 of 40 CFR part 60, Appendix A, Method 9 incorporated by reference in 35 IAC 212.113, for data reduction shall not be used for pushes of less than six minutes duration [35 IAC 212.443(c)(2)(B)].

d. Quenching

i. All coke oven quench towers shall be equipped with grit arrestors or equipment of comparable effectiveness. Baffles shall cover 95 percent or more of the cross sectional area of the exhaust vent or stack and must be maintained. Quench water shall not include untreated coke by-product plant effluent. All water placed on the coke being quenched shall be quench water [35 IAC 212.443(h)(1)].

ii. Total dissolved solids concentrations in the quench water shall not exceed a weekly average of 1200 mg/L [35 IAC 212.443(h)(2)]. Compliance with this requirement shall be demonstrated following the

procedures specified by the NESHAP (40 CFR 63, Subpart CCCCC).

Note: The NESHAP (40 CFR 63, Subpart CCCCC) has a more stringent standard (1100 mg/L) than this state rule.

e. Coke Oven Combustion Stack (Main Stack and Individual Waste Heat Stacks)

i. No person shall cause or allow the emission of particulate matter (as filterable PM, as would be measured in accordance with 35 IAC 212.110) from a coke oven combustion stack to exceed 110 mg/dscm (0.05 gr/dscf) [35 IAC 212.443(g)(1)].

ii. No person shall cause or allow the emission of particulate matter from a coke oven combustion stack to exceed 30% opacity. Compliance shall be determined in accordance with 40 CFR 60, Appendix A, Method 9, incorporated by reference in 35 IAC 212.113 [35 IAC 212.443(g)(2)].

4.1.4 Non-Applicability of Regulations of Concern

a. The affected units are not subject to 35 IAC Part 212 Subpart B, Visible Emission Limitations, because coke plants are exempted by 35 IAC 212.443(a).

b. The affected units are not subject to 35 IAC Part 212 Subpart L, Particulate Matter Emissions From Process Emission Units, because coke plants are exempted by 35 IAC 212.441.

c. This permit is issued based on the affected units not being subject to 35 IAC 219.301 as indicated in 35 IAC 219.302(c) because uncontrolled emissions of organic matter from the units are reduced by at least 85 percent by compliance with the NESHAP, 40 CFR 63 Subpart L.

d. This permit is issued based on the requirements of 35 IAC 212.443(d)(2), which addresses the availability of spare coke oven doors and a door repair facility not being applicable to these non-recovery coke oven batteries. This is because the ovens are designed to operate under negative pressure, unlike a recovery coke oven battery, so that the availability of spare doors is not necessary to prevent emissions from a battery due to door leaks.

4.1.5 Control Requirements and Work Practices

a. i. BACT/LAER Technology

A. Doors: The pressure in each oven or in a common battery tunnel shall be maintained at a negative pressure consistent with the NESHAP for doors.

B. Charging: Charging operations shall be controlled by a baghouse with traveling hood consistent with the NESHAP for charging operations (See also Condition 4.1.3-1(b).)

C. Pushing: Pushing operations shall be controlled by a mobile hood with a multicyclone consistent with the NESHAP for pushing operations. (See also Condition 4.1.3-2(a).)

D. Coking: Combustion gases from the coking process shall be routed to the HRSGs controlled by the spray dryer/fabric filter system, except (1) during inspection and maintenance of HRSGs, which shall comply with Condition 4.1.5(a)(i)(D)(1) below, (2) during inspection and maintenance of the spray dryer/fabric filter system, which shall comply with Condition 4.1.5(a)(i)(D)(2) below, and (3) monthly verification of operability of the lids for the waste heat stacks. The total duration of venting through waste heat stacks, with coking gases not controlled by the spray dryer/fabric filter system, shall not exceed 1872 stack-hours per 12-month rolling period (average 312 hours for the six waste heat stacks). These bypass periods and appropriate operation during periods of bypass shall also be addressed by the Startup Shutdown and Malfunction (SSM) Plan required for the plant by 40 CFR 63.6(e).

1. Combustion gases shall not be vented to the waste heat stacks for more than 192 hours per calendar year per vent stack. There shall be no more than one waste heat vent stack in use at any time. For these periods, the charge rates to the ovens affected by the bypass shall be reduced in accordance with the SSM Plan.

2. Combustion gases shall not be vented to the six individual waste heat stacks during inspection and maintenance of the spray dryer/fabric filter system for more than 120 hours per calendar year. During

this period, the charge rates to the ovens shall be reduced in accordance with the SSM Plan, which at a minimum shall provide that the average charge rate shall be no more than 42.5 tons wet coal per oven.

E. The filter material in the filter system for the main stack shall be a membrane material, micro-fiber material, micro-fiber capped composite material or other similar filter material that has enhanced performance for collection of fine particulate as compared to conventional woven or felt filter material. The filter material shall also have been demonstrated to provide greater than 99.99 percent reduction in emissions of filterable $PM_{2.5}$ or such better performance as the manufacturer will warrrant, as determined by the "Generic Verification Protocol for Baghouse Filtration Products," as used by USEPA's Environmental Technology Verification program for evaluation of filter materials or ASTM Standard D6830-02, Characterizing the Pressure Drop and Filtration Performance of Cleanable Filter Media, or other equivalent protocol.

F. Quenching: Quenching operations shall be controlled by a baffle system and clean quench water consistent with the NESHAP for quench operations. (See also Condition 4.1.3-2(b).)

ii. BACT/LAER Emission Limits

A. Emissions of particulate matter (filterable and condensable) from the charging baghouse shall not exceed 0.016 lb/ton of coal charged.

B. Emissions of particulate matter (filterable and condensable) from the pushing multicyclone shall not exceed 0.08 lb/ton of coke pushed.

C. Emissions of particulate matter from the main stack (coking baghouse) shall not exceed 0.0050 gr/dscf (filterable only) and 0.0110 gr/dscf (filterable and condensable).

D. Emissions of particulate matter (filterable and condensable) during bypass of the spray dryer/fabric filter control system shall not exceed 0.08 gr/dscf.

E. Emissions of particulate matter (filterable only) from the quench tower shall not exceed 0.044 lb/ton coal charged.

Condition 4.1.5(a) represents the application of the Best Available Control Technology and the Lowest Achievable Emission Rate.

b. Control of Mercury Emissions

i. The Permittee shall install, operate, and maintain an activated carbon injection system on the main stack for control of mercury emissions, which system shall be operated to comply with the following requirements for control of mercury emissions from the main stack. This system shall be designed to inject at least 10 pounds of activated carbon per million actual cubic feet of exhaust gases.

ii. This activated carbon injection system shall be operated at all times when the spray dryer/fabric filter system is operated, either at a maximum activated carbon injection rate of 10 pounds per million actual cubic feet of exhaust gases or to achieve an overall mercury control efficiency equivalent to 90 percent, in conjunction with other control measures for the batteries. That is, the Permittee may operate the system at an activated carbon injection rate lower than 10 pounds per hour when the system is used to comply with an emission rate equivalent to 90 percent control. Once such an emission rate has been established, the Permittee may also elect to meet such rate by a combination of carbon injection and other measures including injection of other sorbents or additives, coal specifications, and operational practices for the spray dryer.

c. Control of Other Pollutants

The emissions of other pollutants generated by the coking process shall be processed by the use of a lime spray dryer with a manufacturer's design control efficiency of at least 90% for SO_2 control, staged combustion for NO_x control, and good combustion practices for CO and VOM control.

4.1.6 Production and Emission Limitations

a. The amount of coal charged to the batteries shall not exceed 1,100,000 tons per year on a rolling 12-month basis, measured as wet coal charged to the batteries.

b. i. Emissions from the affected charging operation shall not exceed the following limits:

Pollutant	Emissions		
	(Lbs/Hour)	(Tons/Month)	(Tons/Year)
PM	1.8	0.67	8.06
PM_{10}	1.8	0.67	8.06
SO_2	0.04	0.02	0.16
CO	0.4	0.15	1.53
VOM	0.3	0.11	1.10
Lead	0.000014	----	0.00006

ii. Emissions from the affected pushing operation shall not exceed the following limits:

Pollutant	Emissions		
	(Lbs/Hour)	(Tons/Month)	(Tons/Year)
PM	7.2	2.68	31.41
PM_{10}	7.2	2.68	31.41
SO_2	12.3	4.58	53.66
NO_x	2.4	0.89	10.40
CO	7.9	2.94	34.49
VOM	2.5	0.93	10.95
Lead	0.065	----	0.0084
H_2SO_4	0.63	0.23	2.74

iii. A. Emissions from the main stack shall not exceed the following limits:

Pollutant	Emissions		
	(Lbs/Hour)	(Tons/Month)	(Tons/Year)
PM	28.3	10.53	124.00
PM_{10}	28.3	10.53	124.00
SO_2	227.7*	84.70	997.33
NO_x	125.0	46.50	547.50
CO	26.2	9.75	114.65
VOM	5.6	2.08	24.57
Lead	0.02	----	0.085
H_2SO_4	2.33	0.87	10.17
Mercury	**	**	**

* Compliance with this limit shall be determined as a 30-day rolling average, with emission monitoring for SO_2 in accordance with Condition 4.1.8-1(a).

** See Condition 4.1.6(b)(vi).

B. Limits for emissions of $PM_{2.5}$ may be set by the Illinois EPA after the Permittee has completed a series of emissions tests for $PM_{2.5}$, as provided for by Condition 4.1.7-2(a)(iii).

iv. Emissions from the individual waste heat stacks shall not exceed the following limits:

Pollutant	Emissions	
	(Lbs/Hour)*	(Tons/Year)
PM	34.3	30.24
PM_{10}	34.3	30.24
SO_2	379.5	355.21
NO_x	20.8	19.50
CO	4.4	4.08
VOM	0.9	0.87
Lead	0.065	0.06
H_2SO_4	19.4	18.12

* Lbs/Hour limits are for each individual waste heat stack. Tons/Year limits are total limits, for all waste heat stacks combined.

v. Emissions from the affected quenching operation shall not exceed the following limits:

Pollutant	Emissions	
	(Tons/Month)	(Tons/Year)
PM	6.6	65.70
PM_{10}	2.5	24.09
Lead	---	0.048

vi. Mercury emission limits will be set by the Illinois EPA once initial testing and monitoring for emissions of mercury are completed and at least six months worth of data for mercury emissions and mercury content of coal are collected, as required by Conditions 4.1.7-3 and 4.1.8-3(c).

Note: For this purpose, the Illinois EPA will issue a revised construction permit setting appropriate limits for mercury emissions not later than six months after receipt from the Permittee of the report that is required to be prepared and submitted pursuant to Condition 4.1.8-1(c)(iii).

c. Compliance with the annual limits in Condition 4.1.6 shall be determined on a monthly basis from the sum of the data for the current month plus the preceding 11 months (running 12 month total). For purposes of this Condition, this running 12-month period shall begin following startup of the plant.

4.1.7-1 NESHAP Testing Requirements

a. The Permittee shall comply with the applicable performance tests and procedures in 40 CFR 63.309.

b. As required in 40 CFR 63.7(a)(2), the Permittee shall conduct a performance test to demonstrate compliance with each limit in 40 CFR 63.7290(a) for emissions of particulate matter from a control device applied to pushing emissions that applies within 180 calendar days after initial startup [40 CFR 63.7283 and 63.7320(a)].

c. i. The Permittee shall conduct performance tests to demonstrate compliance with the Total Dissolved Solids limit for quench water in 40 CFR 63.7295(a)(1) upon initial startup[40 CFR 63.7283 and 63.7320(b)].

ii. The Permittee shall comply with the applicable test methods and other procedures required to demonstrate initial compliance with the Total Dissolved Solids limit for quench water in 40 CFR 63.7325.

d. For each work practice standard and operation and maintenance requirement that applies, the Permittee shall demonstrate initial compliance within 30 calendar days after initial startup [40 CFR 63.7283 and 63.7320(c)].

4.1.7-2 Requirements for Testing the Rates of Emissions

a. The Permittee shall conduct emission testing as further provided by Condition 3.5.1 and 4.1.7-2(b) on the following schedule:

i. Initial emission testing shall be conducted as follows, within 60 days after achieving the maximum production rate but no later than 180 days after initial startup of the coke batteries:

A. Main stack: PM_{10}, NO_x, CO, VOM, lead, mercury and sulfuric acid mist.

B. Charging baghouse stacks: PM_{10}.

C. Pushing multiclone stacks: PM_{10} and lead.

Note: Testing of the SO_2 emissions of the main stack will occur during the certification of the continuous emissions monitoring system required by Condition 4.1.8-1(a).

ii. Emission testing shall be conducted for one of the six individual waste heat stacks for PM_{10}, SO_2, lead, and mercury when the stack is in use for by-pass of the associated heat recovery steam generator (HRSG)

by no later than the completion of the fourth scheduled by-pass of an HRSG for purposes of inspection and maintenance.

iii. A series of emissions tests shall be conducted for the main stack for $PM_{2.5}$, PM_{10} and PM, with testing conducted so that data is collected from at least three tests that are separated by approximately one year (between 9 and 15 months apart). For this purpose, the first test may be combined with the initial testing required by Condition 4.1.7-2(a)(i), provided however that this testing shall be completed no later than 42 months after startup of the coke plant.

iv. Testing to verify continuing compliance shall be conducted between 18 and 24 months after the initial emission testing for the main stack required by Condition 4.1.7-2(a)(i):

A. Main stack: NO_x, CO, VOM and lead, and, if requested by the Illinois EPA, sulfuric acid mist.

B. The charging baghouse stack (PM_{10}) and/or the pushing multiclone stack (PM_{10} and lead) if such testing is requested by the Illinois EPA.

b. i. The following methods and procedures shall be used for testing of emissions, unless use of another method developed or supported by USEPA is approved by the Illinois EPA as part of the approval of the test plan. Refer to 40 CFR Part 51, Appendix M and 40 CFR Part 60, Appendix A, for USEPA test methods.

Location of Sample Points	USEPA Method 1
Gas Flow and Velocity	USEPA Method 2
Flue Gas Weight	USEPA Method 3
Moisture	USEPA Method 4
PM	USEPA Method 5
PM_{10} (filterable)	USEPA Method 201A*
PM_{10} (total, filt. & condens.)	USEPA Method 201A* & 202
Sulfur Dioxide	USEPA Method 6 or 6C
Nitrogen Oxides	USEPA Method 7 or 7E
Carbon Monoxide	USEPA Method 10
VOM	USEPA Method 25A
Lead	USEPA Method 12 or 29
Sulfuric Acid Mist	USEPA Method 8A
Mercury	USEPA Method 101A (40 CFR 61, Appendix B); USEPA Method 29 (40 CFR

60, Appendix A); or
ASTM Method D6784-02

* The Permittee may also use Method 5 instead of Method 201A, provided that the measured results are considered PM_{10}.

ii. Testing for emissions of filterable $PM_{2.5}$ shall be conducted using an applicable Reference Method, as adopted by USEPA in 40 CFR Part 51, Appendix M, or in 40 CFR Part 60, Appendix A. If USEPA has not adopted a Reference Method for testing of filterable $PM_{2.5}$ when testing must be performed, testing for filterable $PM_{2.5}$ shall be conducted using an appropriate Conditional Test Method developed by USEPA, e.g., Conditional Test Method 39 or 40, or a Reference Method proposed by USEPA, subject to review by the Illinois EPA as part of the review of the test plan (refer to Condition 3.5.1).

c. i. During the period when required testing for PM emissions of the pushing multiclone stacks is conducted, the Permittee shall take grab samples of the exhaust of the pushing control system and have these samples analyzed for NO_x, SO_2, CO and VOM emissions.

ii. Results of the analysis shall be submitted with other required test reports.

d. i. After completion of the testing for emissions of $PM_{2.5}$ required by Condition 4.1.7-2(a)(iii) but not later than 42 months after initial startup of the coke batteries, the Permittee shall submit a detailed report to the Illinois EPA that provides an assessment of the $PM_{2.5}$ emissions of the main stack that at a minimum includes: the data that has been collected for $PM_{2.5}$ emissions; information confirming proper design for control of $PM_{2.5}$; information confirming proper operation of the control system for effective control of $PM_{2.5}$ emissions while emission data was being collected; and other relevant information related to the $PM_{2.5}$ emissions from the main stack.

ii. Unless establishment of emission limits in terms of $PM_{2.5}$ would be inconsistent with applicable laws or rules at such time, when the Permittee submits the above report, the Permittee shall also apply for a revision to this permit to include limits for emissions of $PM_{2.5}$ from the main stack if the testing conducted pursuant to Condition 4.1.7-2(a)(iii) and

other relevant information demonstrate that for the main stack: reliable and reproducible measurements of $PM_{2.5}$ emissions can be made so as to enable limits to be set in terms on $PM_{2.5}$; implementation of such limits on a continuing basis would be practical; and such limits would be significantly lower than limits in terms of PM_{10} so as to justify any additional effort that would accompany such limits. These limits for emissions of $PM_{2.5}$ shall reflect the lowest rates of emissions that are achievable on a continuing basis with the combination of control devices on the main stack. In addition, in the report required above, the Permittee shall provide its recommended emission limits for $PM_{2.5}$, with the specific data, calculations and the rationale that support those limits.

4.1.7-3 Requirements for Coal Sampling and Analysis

a. The Permittee shall collect monthly composite samples of the coal charged in the ovens.

b. i. The Permittee shall also collect a composite sample of the coal charged in the ovens each time the coal blend is changed. The individual samples for each monthly composite shall be collected from the primary conveyor belt that feeds the batteries.

ii. A sufficient number of individual samples shall be collected so that each composite sample is representative of the average quality of coal charged to the ovens during each calendar month.

c. The coal sampling shall be performed in accordance with ASTM method D2234, Collection of a Gross Sample of Coal.

d. Each monthly composite sample of coal shall be analyzed for sulfur, mercury and chlorine content (percent by weight).

e. The analytical methods for sulfur content, mercury content and chlorine content shall be: ASTM method D3177, Total Sulfur in the Analysis Sample of Coal and Coke or ASTM method D4239, Sulfur in the Analysis Sample of Coal and Coke Using High Temperature Tube Furnace Combustion Methods; D3684 Standard Test Method for Total Mercury in Coal by the Oxygen Bomb Combustion/Atomic Absorption Method or other appropriate ASTM method such as D6722-01; D2361 Standard Test Method for Chlorine in Coal or other appropriate ASTM method such as D6721-01. Alternative, equivalent methods may be used upon written approval from the Illinois EPA.

4.1.8-1 Continuous Emissions Monitoring Requirements

a. The Permittee shall install, calibrate, operate, and maintain SO_2 continuous emission monitoring system(s) (CEMS) for the main stack.

i. This monitoring system shall be operated and maintained in accordance with relevant requirements of 40 CFR 60.13, including being operated in accordance with Performance Specification 6 of 40 CFR 60, Appendix B, and Quality Assurance Procedure 1 of 40 CFR 60, Appendix F.

ii. This monitoring system shall be installed and operational when the initial emission testing specified by Condition 4.1.7-2(a)(i) is performed or is required to be performed and shall thereafter be operated at all times except for continuous monitoring system maintenance, breakdowns and repairs and during the periodic bypass of the main stack, when the control system is undergoing inspection and maintenance.

iii. The Permittee shall maintain records for the continuous monitoring system, including recorded emission concentrations and records of maintenance, calibration, and operational activity associated with the system.

iv. The Permittee shall submit semi-annual monitoring reports to the Illinois EPA for this emission monitoring system in accordance with relevant reporting requirements of the NSPS for continuous emissions monitoring systems, 40 CFR 60.7(c) or (d).

b. The Permittee shall install, calibrate, operate and maintain a continuous emissions monitoring system (CEMS) for PM on the main stack.

i. The Permittee shall operate and properly calibrate and maintain this system in accordance with relevant requirements of the NSPS for monitoring systems, 40 CFR 60.13, and applicable USEPA performance specification and in a manner that is generally consistent with published USEPA guidance for use of PM CEMS. The Permittee shall also operate and maintain this system according to a site-specific monitoring plan, which shall be submitted to the Illinois EPA for its review and comment at least 90 days before the initial startup of the monitoring system. With this submission, the Permittee shall submit the proposed type of monitoring equipment and

proposed sampling location, which shall be approved by the Illinois EPA prior to installation of the PM CEMS.

ii. This system shall be operated on a trial basis for a period of three years, during which time it shall not be used to directly determine compliance but shall be used for compliance assurance monitoring if appropriate based on the quality of data that the system provides. After this trial period, this PM CEMS shall continue to be operated unless the Illinois EPA determines that this system does not provide accurate, reliable data in accordance with USEPA approved performance specifications for PM CEMS, based on operation of the system during the trial period, including the results of periodic emissions testing in accordance with Condition 4.1.7-2 (at least three tests at about one year intervals during the trial period).

iii. If a CEMS for $PM_{2.5}$ becomes available and is approved by the USEPA for an exhaust stream that is similar to the main stack and USEPA adopts a performance specification for $PM_{2.5}$ CEMS, then the Permittee shall install a $PM_{2.5}$ CEMS and begin monitoring for $PM_{2.5}$ within one year of the completion of such actions by USEPA. The operation of this $PM_{2.5}$ CEMS shall also be subject to the provisions of Conditions 4.1.8-1(b)(i) and (ii) upon installation and the $PM_{2.5}$ CEMS shall only replace the PM CEMS on the main stack after the Illinois EPA determines that $PM_{2.5}$ CEMS is able to reasonably provide accurate and reliable data for particulate emissions measured as $PM_{2.5}$.

iv. The Permittee shall submit all PM CEMS and emission test data (including but not limited to emission test data to calibrate this CEMS) in electronic format (or other format specified by the Illinois EPA) to the Illinois EPA on a semi-annual basis, together with the semi-annual reports regarding its PM and $PM_{2.5}$ monitoring.

c. The Permittee shall install, calibrate, operate and maintain a monitoring system for mercury emissions from the main stack.

i. This monitoring shall be conducted with a mercury sorbent trap monitoring system in accordance with 40 CFR 75.15 (as adopted by USEPA, even if subsequently vacated) or, alternatively, with an approved continuous mercury emissions monitoring system in accordance with 40 CFR 75.81 (as adopted by USEPA,

even if subsequently vacated). In addition to other applicable requirements of 40 CFR Part 75, the Permittee shall submit semi-annual monitoring reports to the Illinois EPA for this monitoring in accordance with relevant reporting requirements of 40 CFR Part 75.

ii. After the initial period of data collection needed to set emission limits for mercury, this monitoring system shall continue to be operated to verify compliance with such limit unless the Illinois EPA determines either that this monitoring system would still provide accurate, reliable data to verify compliance with the applicable limits for mercury emissions if operated on a periodic basis, or, if monitoring was initially conducted with sorbent traps, for ongoing monitoring to verify compliance with mercury emission limits to be effective, such monitoring should be conducted with a continuous emissions monitoring system in accordance with 40 CF 75, Subpart H.

iii. After completion of initial monitoring for emissions of mercury but not later than nine months after beginning operation of the monitoring system, the Permittee shall apply for a revision to this permit to include limits for mercury emissions, which limits reflect emission rates that are achievable with effective control by the combination of the spray dryer, carbon injection system and baghouse and are based on the emission data that has been collected and relevant information about the mercury content of the coal supply to the plant and operation of control devices, including the activated carbon injection system. With this application, the Permittee shall submit a detailed report to the Illinois EPA that provides an assessment of the mercury emissions of the plant and the effectiveness of the control system that at a minimum includes: the data that has been collected for mercury emissions; information confirming proper design of the activated carbon injection system for control of mercury; information confirming proper operation of the control system for effective control of mercury emissions while emission data was being collected; the results of the analyses of coal for mercury content required by Condition 4.1.7-3, with estimates of the theoretical emissions of mercury in the absence of any control; and other information that the Permittee considers relevant, together with the Permittee's recommended emission limits for mercury, with the specific data, calculations and the rationale for those limits.

iv. Notwithstanding Condition 4.1.5(b)(ii), as reasonably needed for the specific purpose of evaluating the effectiveness of activated carbon in controlling emissions of mercury and proposing limits for mercury emissions, during the initial period of data collection for mercury emissions, the Permittee may inject activated carbon at a rate less than 10 pounds per hour, provided that such operation occurs in accordance with an evaluation plan that the Permittee has provided to the Illinois EPA at least 30 days in advance and the data and findings from such operation are included in the above report.

4.1.8-2 Continuous Operational Monitoring Requirements

a. i. The Permittee shall install, operate, and maintain equipment to monitor the pressure drop across each charging baghouse.

ii. The Permittee shall operate, calibrate and maintain this monitoring system in accordance with good monitoring practices, following the manufacturer's recommended operating and maintenance procedures or such other procedures for such devices as otherwise necessary to assure reliable operation of such systems and keeping records for the operation, maintenance and repair of such systems.

b. The Permittee shall install, operate and maintain a Bag Leak Detector System (BLDS) to monitor the operation of the baghouse on the main stack. The BLDS shall be installed, operated and maintained in a manner that is consistent with the provisions of 40 CFR 63.7505(d) and 63.7525(i) (i.e., as adopted by USEPA at 69 FR 55218, Sept. 13, 2004 and 71 FR 70651, Dec. 6, 2006, prior to vacatur), provided however, that the Illinois EPA shall substitute for the Administrator of the USEPA.

c. NESHAP Monitoring for Pushing

i. The Permittee shall comply with the applicable monitoring requirements in 40 CFR 63.7330 and 63.7332, which requires a continuous monitoring system for the pressure drop of the multiclone control system for pushing.

ii. The Permittee shall comply with the applicable installation, operation and maintenance requirements for such monitors in 40 CFR 63.7331.

4.1.8-3 Instrumentation Requirements

a. The Permittee shall install, operate, and maintain devices to measure the gas temperature of each afterburner tunnel system. Data measured by these devices shall be recorded at least twice per day.

b. The Permittee shall install, operate, and maintain equipment to measure the pressure drop across the baghouse on the main stack. Data measured by this device shall be recorded at least twice per day.

c. The Permittee shall install, operate, and maintain instrumentation for the setting for or rate of sorbent injection rate of the activated carbon injection system. Data measured by this device shall be recorded at least twice per day and whenever the setting for the activated carbon injection system is adjusted.

d. The Permittee shall install, operate, and maintain sensors on each waste heat stack to detect when the stack lid, which controls flow from the stack, is open, or partially opened, either due to relieving system pressure or manual opening of the stack by the operator. These sensors shall be instrumented to the operator and an alarm sounded, or other mechanism such as indicator lights or control screen indicators, when there is gas flow through any of the waste heat stacks.

e. The Permittee shall operate and maintain all instrumentation required by Condition 4.1.8-3 in accordance with good monitoring practices, following the manufacturer's recommended operating and maintenance procedures or such other procedures for such devices as otherwise necessary to assure reliable operation of such devices and keeping records for the operation, maintenance and repair of such devices.

4.1.9 Recordkeeping Requirements

a. The Permittee shall maintain the following operating records for the affected units:

i. Records of the amount of coal charged to the batteries on a rolling 12-month basis, measured as wet coal charged to the batteries (tons/year).

ii. Records for the usage of sorbents by the activated carbon injection system (pounds/month, by type).

iii. Monthly records of the results of the analyses for sulfur content, mercury content, and chlorine content of the coal charged.

iv. Operating records for the Waste Heat Stacks

A. Daily records for each waste heat stack for any periods when there was venting, i.e., exhaust flow through the stack.

B. Records for periods when emissions are vented through waste heat stacks that at a minimum include the following:

I. The date, time, and duration of each bypass event, with the identity of the stack that is involved and the reason for the bypass event; and

II. Summary records for the duration of venting for each individual stack and all stacks to verify compliance with applicable operating limitations.

b. The Permittee shall maintain the following records related to the emissions of the affected units or groups of affected units for which limits are set in Condition 4.1.6(b), so as to address compliance with those limits. These records shall also address emissions of mercury from the coking process:

i. Other than for SO_2 emissions from the main stack, for which continuous emissions monitoring is performed, the standard emission factors (lbs/ton) used by the Permittee for estimating controlled emissions from the unit, which information shall be based on site-specific test data, representative test data or emission determination methodology published by USEPA, with supporting explanation and calculations.

ii. For periods when a unit or group of units is not operating normally, if not otherwise required by applicable regulations, identification of each such period, with detailed information describing the operation of the unit(s), the potential consequences for additional emissions from the unit(s), the potential of any excess emissions from the affected unit(s), the actions taken to restore normal operation, and any actions taken to prevent similar events in the future.

iii. Emissions of pollutants for which limits are set (tons/month and tons/year), with supporting calculations.

c. The Permittee shall comply with the applicable recordkeeping requirements in the NESHAP, 40 CFR 63.311, 63.7342 and 63.7343.

d. The Permittee shall maintain a file that contains information, with supporting documentation, that confirms that the filter material in the baghouse for the main stack complies with Condition 4.1.5(a)(i)(E).

4.1.10 Reporting Requirements

a. The Permittee shall promptly notify the Illinois EPA of deviations of an affected unit with the permit requirements of this section (Section 4.1). These reports shall contain the information specified in Condition 3.5.2, including a description the probable cause of such deviations, and any corrective actions or preventive measures taken.

i. Emissions or operation of the affected units in excess of the limits specified in Condition 4.1.6 shall be reported within 30 days of such occurrence.

ii. Any event in which the duration of venting through a waste heat stack is 60 minutes or longer, other than for scheduled inspection and maintenance of heat recovery steam generators or control equipment shall be reported within 10 days of such occurrence.

iii. Other deviations shall be reported with the periodic compliance reports required by the NESHAP. These reports shall also include a listing of the above deviations, for which individual deviation notices have been submitted, with the date of the deviation notice.

b. The Permittee shall comply with the applicable reporting requirements in 40 CFR 63.311 for the affected units.

c. The Permittee shall comply with the requirements for reporting of deviations in 40 CFR 63.7336.

d. The Permittee shall comply with the applicable notification requirements in 40 CFR 63.7340.

e. The Permittee shall comply with the applicable reporting requirements in 40 CFR 63.7341.

f. For venting through the waste heat stacks, the Permittee shall submit periodic reports to the Illinois EPA that include the following information and, as applicable for any venting that was a deviation, other applicable information pursuant to Condition 3.5.2. These reports shall be submitted on at least a semi-annual basis with the periodic compliance reports required by the NESHAP.

i. For each waste heat stack, the total duration of venting during the reporting period and a listing of each period when venting occurred, with date, time, duration (minutes), description and reason for venting.

ii. For each period in which venting from waste heat stack(s) occurred as part of inspection and maintenance of a heat recovery steam generator or control equipment, the date, time and duration of venting, the waste heat stack(s) that were involved, a general description of the inspection and maintenance activity that was performed, a description of aspects of or events during inspection and maintenance that acted to prolong venting, a description of measures that the Permittee took to address such circumstances, a description of actions that the Permittee plans to address the potential for such circumstances in the future, and other relevant information to demonstrate that the duration of venting associated with the inspection and maintenance activity was not excessive.

iii. For each operational limit that applies to venting from waste heat stacks, information that addresses compliance with such limit.

4.2 Material Handling Operations

4.2.1 Description

Trucks deliver coal to the plant and unload the coal within an enclosure. Wet suppression is used to minimize particulate emissions. The coal is crushed within an enclosure and transferred to a silo for storage until needed at the coke oven batteries.

The quenched coke from the ovens is crushed and then screened. These operations are conducted inside a building which is vented to a baghouse. The coke that is sized for use in a blast furnace is transferred to an enclosure at US Steel. The undersize material is transferred to a bunker.

Certain material, e.g., quenched coke and coke breeze are considered wet materials either because of their inherent moisture or moisture added by water sprays so that specific practices to control dust are not needed.

4.2.2 List of Emission Units and Air Pollution Control Equipment

Emission Unit	Description	Emission Control Equipment
Coal Unloading	Coal is delivered to the plant and unloaded.	Enclosure, wet suppression
Coal Storage Silo	Coal is stored in a silo to minimize dust and maintain proper moisture content.	Work practices
Coal Conveyors	Conveyors move the coal from one area of the plant to another.	Enclosed transfer points and covered belts with exception of those connected to the tripper which are unenclosed/uncovered for safety, moisture content
Coal Sizing	Coal enters the plant in various sizes. Crushing/Screening sorts the coal into preferred sizes.	Enclosure, moisture content

Emission Unit	Description	Emission Control Equipment
Coke Conveyors	Conveyors move the coke form one area of the plant to another.	Enclosed transfer points and covered belts with exception of those at coke wharf which are unenclosed/uncovered for safety, moisture content
Coke Crushing and Screening	Quenched coke is crushed and screened.	Enclosure, baghouse
Emergency Coke Storage Pile	An emergency coke storage pile is available in the event processing through the screening and crushing area is not available.	Work practices

4.2.3 Applicable Provisions and Regulations

a. An "affected unit" for the purpose of these unit-specific conditions, is a material handling operation described in Conditions 4.2.1 and 4.2.2.

b. The affected units are subject to 35 IAC Part 212 Subpart K: Fugitive Particulate Matter.

i. All unloading and transporting operations of materials collected by pollution control equipment shall be enclosed or shall utilize spraying, pelletizing, screw conveying or other equivalent methods [35 IAC 212.307].

ii. Crushers, screening operations, conveyor transfer points, and conveyors shall be sprayed with water or a surfactant solution, utilize choke-feeding or be treated by an equivalent method in accordance with the operating program (See Condition 3.3) [35 IAC 212.308].

iii. Emissions from the particulate collection equipment operated pursuant to 35 IAC 212.304 through 212.310 and 212.312, shall not exceed 68 mg/dscm (0.03 gr/dscf) [35 IAC 212.313] (See also Condition 4.2.3(d)).

iv. No person shall cause or allow fugitive particulate matter emissions generated by the crushing or screening of coke or coal to exceed an opacity of 10 percent [35 IAC 212.316(b)].

v. No person shall cause or allow fugitive particulate matter emissions from any storage pile to exceed an opacity of 10 percent , to be measured four feet from the pile surface [35 IAC 212.316(d)].

vi. Unless an emission unit has been assigned a particulate matter, PM_{10}, or fugitive particulate matter emissions limitation elsewhere in 35 IAC 212.316 or in 35 IAC Part 212 Subpart R or S, no person shall cause or allow fugitive particulate matter emissions from any emission unit to exceed an opacity of 20 percent [35 IAC 212.316(f)].

c. i. The affected units are each subject to 35 IAC 212.324(b), which provides no person shall cause or allow the emission into the atmosphere, of PM_{10} from certain process emission units to exceed 68.7 mg/scm (0.03 gr/scf) during any one hour period.

ii. Pursuant to 35 IAC 212.324(d), the above mass emission limit shall not apply to an emission unit if it has no visible emissions other than fugitive particulate matter, provided, however, that this exception is not a defense to a finding of violation of the above mass limit determined by emission testing.

d. The affected units are subject to 35 IAC 212.458: Emission Units in Certain Areas.

i. The affected units are subject 35 IAC 212.458(b)(7), which provides that no person shall cause or allow emissions of particulate matter (as filterable PM, as would be measured in accordance with 35 IAC 212.108), other than that of fugitive particulate matter, into the atmosphere to exceed, during any one hour period, 22.9 mg/scm (0.01 gr/scf) from any process emissions unit, except as otherwise provided in 35 IAC 212.458 or in 35 IAC 212.443 and 212.446.

e. The affected units, excluding the units identified in Condition 4.2.4(b) and units subject to 35 IAC Part 212 Subpart R which are excluded by 35 IAC 212.441, are subject to 35 IAC 212.321(a), which provides that no person shall cause or allow the emission of particulate matter into the atmosphere in any one hour period from any new process emission unit which, either alone or in combination with the emission of particulate matter from all other similar new process emission units, at a source or premises, exceeds the allowable emission rates specified in 35 IAC

212.321 (c) or calculated in accordance with 35 IAC 212.321(b).

f. Affected units engaged in handling and processing coal shall comply with applicable requirements of the NSPS for Coal Preparation Plants, 40 CFR 60, Subpart Y, and related provisions of 40 CFR 60, Subpart A.

i. Pursuant to the NSPS, the opacity of the exhaust from coal processing and conveying equipment, coal storage systems (other than open storage piles), and coal loading systems shall not exceed 20 percent [40 CFR 60.252(c)].

ii. At all times, the Permittee shall maintain and operate affected units that are subject to NSPS, including associated air pollution control equipment, in a manner consistent with good air pollution control practices for minimizing emissions, pursuant to 40 CFR 60.11(d).

4.2.4 Non-Applicability of Regulations of Concern

a. The affected units are not subject to the NSPS for Nonmetallic Mineral Processing Plants, 40 CFR Part 60 Subpart OOO, because coal and coke are not nonmetallic minerals as defined in 40 CFR 60.671.

b. The storage piles and associated operations and the coal/coke handling operations are not subject to 35 IAC 212.321 pursuant to 35 IAC 212.323, which provides that 35 IAC 212.321 shall not apply to emission units, such as stock piles, to which, because of the disperse nature of such emission units, such rules cannot reasonably be applied.

4.2.5 Control Requirements and Work Practices

a. BACT/LAER Technology

i. PM and PM_{10} emissions from an affected unit handling a wet material shall be controlled by the following measures. For this purpose, wet material is a material that has sufficient moisture during normal operation to minimize the potential for direct emissions.

A. Maintaining the material with adequate moisture to prevent visible emissions directly from such unit during the handling, storage or load out of the material.

B. Collection of spilled material that could become airborne if it dried or were subject to vehicle traffic as part of the Program for Control of Fugitive Dust required by Condition 4.3.

ii. PM and PM_{10} emissions from an affected unit handling a dry material, other than coal transfer and storage operations or a storage pile for dry material and handling operations associated with the storage pile, shall be controlled by:

A. Enclosure of the unit so as to prevent visible fugitive emissions, as defined by 40 CFR 60.671, from the affected unit.

B. Aspiration to a control device designed to emit no more than 0.005 grains/dry standard cubic foot (gr/dscf) (filterable only) and 0.008 gr/dscf (filterable and condensable), which device shall be operated in accordance with good air pollution control practice to minimize emissions. For this purpose, the control device shall be a baghouse or other filtration type device unless the Permittee demonstrates and the Illinois EPA concurs that another type of control device is preferable due to considerations of operational safety.

iii. PM and PM_{10} emissions from coal transfer and storage operations and storage piles for dry material, including material handling operations associated with the piles, shall be controlled by application of water or other dust suppressants so as to minimize fugitive emissions to the extent practicable. For this purpose, there shall either:

A. Be no visible emissions from the affected unit, as determined in accordance with USEPA Method 22, or

B. A nominal control efficiency of 90 shall be achieved from the uncontrolled emission rate, as follows, as determined using appropriate USEPA emission factors for particulate emissions from handling of a material dry, in the absence of any control of emissions, and engineering analysis and calculations for the control measures that are actually present.

Condition 4.2.5(a) represents the application of the Best Available Control Technology and the Lowest Achievable Emission Rate.

b. Storage piles shall be equipped and operated with adjustable stacker(s), rotary stacker(s), ladders or other comparable devices to minimize the distance that material drops when added to the pile and minimize the associated PM emissions.

c. The Permittee shall implement and maintain control measures for the affected units that minimize visible emissions of PM and provide assurance of compliance with the applicable limits and standards in Conditions 4.2.3 and 4.2.5(a) and (b).

d. The affected units, including associated control equipment shall be operated and maintained in accordance with good air pollution control practice to minimize emissions.

4.2.6 Production and Emission Limitations

a. i. The emissions of fugitive dust from coal handling, storage and processing shall not exceed 4.91 tons/year of PM and 2.34 tons/year of PM_{10}.

ii. The emissions of fugitive dust from coke handling, processing and storage shall not exceed 2.06 tons/year of PM and 0.98 tons/year of PM_{10}.

iii. Emissions coke crushing and screening shall not exceed 9.39 tons/year of PM/PM_{10}.

b. Compliance with annual limits shall be determined on a monthly basis from the sum of the data for the current month plus the preceding 11 months (running 12 month total).

4.2.7 Testing Requirements

a. Initial Performance Testing

i. Within 60 days after achieving the maximum production rate at which each affected unit subject to NSPS will be operated, but not later than 180 days after initial startup of each such unit, the Permittee shall have emissions tests conducted at its expense as follows below by an approved testing service under unit operating conditions that are representative of maximum emissions.

ii. The following USEPA methods and procedures shall be used for PM and opacity measurements as specified in 40 CFR 60.254:

Opacity - Method 9, with measurements performed by a certified observer.

iii. Test plan(s), test notifications, and test reports shall be submitted to the Illinois EPA in accordance with Condition 3.5.

b. Periodic Testing

i. A. The Permittee shall have the opacity of the emissions of the affected units, during representative weather and operating conditions, determined by a qualified observer in accordance with USEPA Test Method 9, as further specified below.

1. If emissions are normally visible from a unit when it is in operation, as determined by USEPA Reference Method 22, opacity testing shall be conducted at least annually.

2. Upon written request by the Illinois EPA, such testing shall be conducted for specific affected units within 45 calendar days of the request or on the date agreed upon by the Illinois EPA, whichever is later.

B. The duration of opacity observations for each test shall be at least 30 minutes (five 6-minute averages) unless the average opacities for the first 12 minutes of observations (two six-minute averages) are both less than 5.0 percent.

C. 1. The Permittee shall notify the Illinois EPA at least 7 days in advance of the date and time of these tests, in order to allow the Illinois EPA to witness testing. This notification shall include the name and employer of the qualified observer(s).

2. The Permittee shall promptly notify the Illinois EPA of any changes in the time or date for testing.

D. The Permittee shall provide a copy of its observer's readings to the Illinois EPA at the time of testing, if Illinois EPA personnel are present.

E. The Permittee shall submit a written report for this testing within 15 days of the date of testing. This report shall include:

1. Date and time of testing.

2. Name and employer of qualified observer.

3. Copy of current certification.

4. Description of observation conditions, including recent weather.

5. Description of the operating conditions of the affected processes.

6. Raw data.

7. Opacity determinations.

8. Conclusions.

ii. Unless otherwise specified for the affected units by the source's CAAPP permit:

A. Within 90 days of a written request from the Illinois EPA, the Permittee shall have the PM emissions at the stacks or vents of affected units, as specified in such request, measured during representative operating conditions, as set forth below.

B. 1. Testing shall be conducted using appropriate USEPA Test Methods, including Method 5 or 17 for PM emissions.

2. Compliance may be determined from the average of three valid test runs, subject to the limitations and conditions contained in 35 IAC Part 283.

C. The Permittee shall submit a test plan to the Illinois EPA at least 60 days prior to testing, which plan shall include the information for test plans specified by General Condition 3.5.

D. The Illinois EPA shall be notified prior to these tests to enable the Illinois EPA to observe these tests. Notification of the expected date of testing shall be submitted a minimum of 30 days prior to the expected date. Notification of the actual date and expected time of testing shall be submitted a minimum of 5 working days prior to the actual date of the test. The Illinois EPA may, at its discretion, accept notification with shorter advance notice provided that the Illinois EPA will not accept such notification if it interferes with the Illinois EPA's ability to observe the testing.

E. The Permittee shall expeditiously submit Final Report(s) for required emission testing to the Illinois EPA, no later than 90 days after the date of testing. These reports shall include the information specified in Condition 3.5 and the following information:

1. A summary of results.

2. Detailed description of test method(s), including description of sampling points, sampling train, analysis equipment, and test schedule.

3. Detailed description of the operating conditions of the affected process during testing, including operating rate (tons/hr) and the control measures being used.

4. Detailed data and calculations, including copies of all raw data sheets and records of laboratory analyses, sample calculations, and data on equipment calibration.

5. Representative opacity data (6-minute average) measured during testing.

c. i. Within 180 days of initial startup of the coke plant, the PM_{10} emissions from the baghouse controlling the coke screening operation shall be measured during conditions which are representative of maximum emissions.

ii. The following methods and procedures shall be used for testing of emissions, unless another method is

approved by the Illinois EPA: Refer to 40 CFR 60, Appendix A, for USEPA test methods.

Location of Sample Points	USEPA Method 1
Gas Flow and Velocity	USEPA Method 2
Flue Gas Weight	USEPA Method 3
Moisture	USEPA Method 4
PM_{10} (filterable)	USEPA Method 201A*

* The Permittee may also use Method 5, instead of Method 201A, provided that the measured results are considered PM_{10}.

iii. The Permittee shall submit reports and notifications for this emissions testing as required by Condition 3.5.1.

4.2.8 Operational Instrumentation and Inspection Requirements

a. Operational Instrumentation

i. The Permittee shall install, operate and maintain systems to measure the pressure drop across each baghouse used to control affected units, other than bin vent filters and other similar filtration devices.

ii. The Permittee shall maintain the records of the measurements made by these systems and records of maintenance and operational activity associated with the systems.

b. Inspections

i. A. The Permittee shall conduct inspections of affected units on at least a monthly basis with personnel who are not directly responsible for the day-to-day operation of these units, for the specific purpose of verifying that the measures identified in the operating program and other measures required to control emissions from affected units are being properly implemented.

B. These inspections shall include observation for the presence of visible emissions, performed in accordance with USEPA Method 22, from buildings in which affected units are located and from units from which the Permittee has elected to demonstrate no visible emissions.

ii. The Permittee shall perform detailed inspections of the dust collection equipment for affected units while the units are out of service, with an initial inspection performed before any maintenance and repair activities are conducted during the period the unit is out of service and a follow-up inspection performed after any such activities are completed. These inspections shall be conducted at least every 15 months.

4.2.9 Recordkeeping Requirements

a. For affected units that are subject to NSPS, the Permittee shall fulfill applicable recordkeeping requirements of the NSPS, 40 CFR 60.7.

b. The Permittee shall maintain file(s), which shall be kept current, that contain:

i. The maximum operating capacity of each affected unit or group of related units (tons/hour).

ii. A. For the baghouses and other filter devices associated with affected units, design specifications for each device (type of unit, maximum design exhaust flow (acfm and scfm), filter area, type of filter cleaning, performance guarantee for particulate exhaust loading in gr/scf, etc.), the manufacturer's recommended operating and maintenance procedures for the device, and design specification for the filter material in each device (type of material, surface treatment(s) applied to material, weight, performance guarantee, warranty provisions, etc.).

B. For each baghouse, the normal range of pressure drop across the device and the minimum and maximum safe pressure drop for the device, with supporting documentation.

iii. For affected units that are not controlled with baghouses or other filter-type devices, a detailed description of the work practices used to control emissions of PM pursuant to Condition 4.2.5(c). These control measures are referred to as the "established control measures" in this subsection of this permit.

iv. The designated PM emission rate, in pounds/hour and tons/year, from affected units, either individually or grouped by related units, with supporting

calculations and documentation, including detailed documentation for the level of emissions control achieved through the work practices that are used to control PM emissions.

v. A demonstration that confirms that the above established control measures are sufficient to assure compliance with the above emissions rates and, for units to which it applies, Condition 4.2.3(e), at the maximum process weight rate at which each affected unit can be operated (tons/hour), with supporting emission calculations and documentation for the emission factors and the efficiency of the control measures being relied upon by the Permittee. Except as addressed by Condition 4.2.9(b)(ii) or testing of PM emissions from an affected unit is conducted in accordance with Condition 4.2.7(b), this demonstration shall be developed using emission factors for uncontrolled PM emissions, efficiency of control measures, and controlled PM emissions published by USEPA.

c. The Permittee shall keep records for the amount of bulk materials received by or loaded out from the plant by category or type of material (tons/month).

d. i. The Permittee shall keep inspection and maintenance log(s) or other records for the control measures associated with the affected units, including buildings and enclosures, dust suppression systems and control devices.

ii. These records shall include the following information for the inspections required by Condition 4.2.8(b)(i):

A. Date and time the inspection was performed and name(s) of inspection personnel.

B. The observed condition of the control measures for each affected unit, including the presence of any visible emissions.

C. A description of any maintenance or repair associated with established control measures that are recommended as a result of the inspection and a review of outstanding recommendations for maintenance or repair from previous inspection(s), i.e., whether recommended action has been taken, is yet to be performed or no longer appears to be required.

D. A summary of the observed implementation or status of actual control measures, as compared to the established control measures.

iii. These records shall include the following information for the inspections required by Condition 4.2.8(b)(ii):

A. Date and time the inspection was performed and name(s) of inspection personnel.

B. The observed condition of the dust collection equipment.

C. A summary of the maintenance and repair that is to be or was conducted on the equipment.

D. A description of any maintenance or repair that is recommended as a result of the inspection and a review of outstanding recommendations for maintenance or repair from previous inspection(s), i.e., whether recommended action has been taken, is yet to be performed or no longer appears to be required.

E. A summary of the observed condition of the equipment as related to its ability to reliably and effectively control emissions.

e. The Permittee shall maintain records of the following for each incident when any affected unit operated without the control measures required by Condition 4.2.5(a) or 4.2.5(c) or (d):

i. The date of the incident and identification of the unit(s) that were involved.

ii. A description of the incident, including: the established control measures that were not present or implemented; the established control measures that were present, if any; and other control measures or mitigation measures that were implemented, if any.

iii. The time at and means by which the incident was identified, e.g., scheduled inspection or observation by operating personnel.

iv. Operational data for the incident, e.g., the measured pressure drop of a baghouse, if the pressure drop of the baghouse, as measured pursuant to Condition 4.3.8, deviated outside the levels set as good air pollution control practices.

v. The corrective action(s) taken and the length of time after the incident was identified that the unit(s) continued to operate before established control measures were in place or the operations were shutdown (to resume operation only after established control measures were in place) and, if this time was more than one hour, an explanation why this time was not shorter, including a detailed description of any mitigation measures that were implemented during the incident.

vi. The estimated total duration of the incident, i.e., the total length of time that the unit(s) ran without established control measures and the estimated amount of material processed during the incident.

vii. A discussion of the probable cause of the incident and any preventative measures taken.

viii. An estimate of any additional emissions of PM (pounds) above the PM emissions associated with normal operation that resulted from the incident, if any, with supporting calculations.

ix. A discussion whether any applicable emission standard, as listed in Condition 4.2.5 or 4.2.3 or any applicable emission rate, as identified in the records pursuant to Condition 4.2.9(b), may have been violated during the incident, with an estimate of the amount of any excess PM emissions (lbs) and supporting explanation.

f. The Permittee shall maintain the following records for the emissions of the affected units:

i. A file containing the standard emission factors used by the Permittee to determine PM emissions from the units, with supporting documentation.

ii. Records of PM emissions based on operating data for the unit(s) and appropriate emission factors, with supporting documentation and calculations.

g. The Permittee shall keep records for all opacity measurements made in accordance with USEPA Method 9 for affected units that it conducts or that are conducted at its behest by individuals who are qualified to make such observations. For each occasion on which such measurements are made, these records shall include the formal report for the measurements if conducted pursuant to Condition 4.2.7 or otherwise the identity of the observer, a description of

the measurements that were made, the operating condition of the affected unit, the observed opacity, and copies of the raw data sheets for the measurements.

4.2.10 Reporting Requirements

a. Notifications

i. The Permittee shall notify the Illinois EPA within 30 days of deviations from applicable emission standards or operating requirements for the affected units that continue* for more than 24 hours. These notifications shall include the information specified by Condition 3.5.2.

* For this purpose, time shall be measured from the start of a particular event. The absence of a deviation for a short period shall not be considered to end the event if the deviation resumes. In such circumstances, the event shall be considered to continue until corrective actions are taken so that the deviation ceases or the Permittee takes the affected unit out of service for repairs.

b. Reports

i. The Permittee shall submit semi-annual reports to the Illinois EPA for all deviations from emission standards, including standards for visible emissions and opacity, and operating requirements set by this permit. These notifications shall include the information specified by Condition 3.5.2.

ii. These reports shall also address any deviations from applicable compliance procedures established by this permit for affected units.

4.3 Roadways and Other Open Areas

4.3.1 Description

The affected units for the purpose of these unit-specific conditions are roadways, parking areas, and other open areas associated with the operation of the proposed plant, which may be sources of fugitive particulate matter due to vehicle traffic or wind blown dust. These emissions are controlled by paving and implementation of work practices to prevent the generation and emissions of particulate matter.

4.3.2 List of Emission Units and Air Pollution Control Equipment

Emission Unit	Description	Emission Control Equipment
Roadways and Other Open Areas	Paved and unpaved roads; parking lots; other open areas.	Fugitive Dust Control Program

4.3.3 Applicable Provisions and Regulations

a. An "affected unit" for the purpose of these unit-specific conditions, are the units described in Conditions 4.3.1 and 4.3.2.

b. i. The affected units are subject to 35 IAC 212.301, which provides that no person shall cause or allow the emission of fugitive particulate matter from any process, including any material handling or storage activity, that is visible by an observer looking generally toward the zenith at a point beyond the property line of the source.

ii. Not withstanding the above, pursuant to 35 IAC 212.314, the above limit shall not apply and spraying to control fugitive dust pursuant to 35 IAC 212.304 through 212.310 and 212.312 shall not be required when the wind speed is greater than 25 mile/hour (40.2 km/hour), as determined in accordance with the provisions of 35 IAC 212.314.

c. The affected units are subject to 35 IAC 212.306, which provides that all normal traffic pattern access areas surrounding storage piles specified in 35 IAC 212.304 and all normal traffic pattern roads and parking facilities shall be paved or treated with water, oils or chemical dust suppressants. All paved areas shall be cleaned on a regular basis. All areas treated with water, oils or chemical dust suppressants shall have the treatment applied on a regular basis, as needed, in accordance with the

operating program required by 35 IAC 212.309, 212.310 and 212.312 (See also Condition 3.3.1).

d. The affected units are subject to 35 IAC 212.316, which provides that no person shall cause or allow the opacity of fugitive particulate matter emissions at certain sources to exceed the following limits:

i. 5 percent from any roadway or parking area [35 IAC 212.316(e)(1)].

ii. 20 percent for emission units not addressed above based on six minute averaging [35 IAC 212.316(f)].

4.3.4 Non-Applicability of Regulations of Concern

Non-applicability of regulations of concern are not set for the affected units.

4.3.5 Control Requirements and Work Practices

a. BACT/LAER Technology

i. The opacity of fugitive particulate matter emissions from affected units shall not exceed 5 percent opacity. For this purpose, opacity shall be determined in accordance with 35 IAC 212.109 and 35 IAC 212.314, respectively.

ii. A. Good air pollution control practices shall be implemented to minimize and significantly reduce nuisance dust from affected units associated with the new coke plant. After construction of the coke plant is complete, these practices shall provide for pavement on all regularly traveled roads and treatment (flushing, vacuuming, dust suppressant application, etc.) of roadways and areas that are routinely subject to vehicle traffic for very effective control of dust.

B. For this purpose, roads that serve any new office building, new employee parking areas or are used on a daily basis by operating and maintenance personnel for the coke plant in the course of their typical duties, roads that experience heavy use during regularly occurring maintenance of the coke plant during the course of a year, shall all be considered to be subject to regular travel and are required to be paved. Regularly traveled roads shall be considered to be subject to routine vehicle

traffic except as they are used primarily for periodic maintenance and are currently inactive or as traffic has been temporarily blocked off. Other roads shall be considered to be routinely traveled if activities are occurring such that they are experiencing significant vehicle traffic.

iii. The handling of material collected from any affected unit associated with the coke plant by sweeping or vacuuming trucks shall be enclosed or shall utilize spraying, pelletizing, screw conveying or other equivalent methods to control PM emissions.

Condition 4.3.5(a) represents the application of the Best Available Control Technology and the Lowest Achievable Emission Rate.

4.3.6 Production and Emission Limitations

a. The emissions of fugitive dust from roadways and parking lots shall not exceed 16.03 tons/year of PM and 3.13 tons/year of PM_{10}.

b. Compliance with annual limits shall be determined on a monthly basis from the sum of the data for the current month plus the preceding 11 months (running 12 month total).

4.3.7 Testing Requirements

a. Opacity Measurement Requirements

i. The Permittee shall conduct performance observations, which include a series of observations of the opacity of fugitive emissions from the affected units as follows to determine the range of opacity from affected units and the change in opacity as related to the amount and nature of vehicle traffic and implementation of the operating program. For performance observations, the Permittee shall submit test plans, test notifications and test reports, as specified by General Condition 3.5.

A. Performance observations shall first be completed no later than 30 days after the date that initial emission testing of the coke oven batteries are performed, in conjunction with the measurements of silt loading on the affected units required by Condition 4.3.7(b).

B. Performance observations shall be repeated within 30 days in the event of changes involving affected units that would act to increase opacity (so that observations that are representative of the current circumstances of the affected units have not been conducted), including changes in the amount or type of traffic on affected units, changes in the standard operating practices for affected units, such as application of salt or traction material during cold weather, and changes in the operating program for affected units.

ii. Compliance observations shall be conducted for affected units on at least a quarterly basis to verify opacity levels and confirm the effectiveness of the operating program in controlling emissions.

iii. Upon written request by the Illinois EPA, the Permittee shall conduct performance or compliance observations, as specified in the request. Unless another date is agreed to by the Illinois EPA, performance observations shall be completed within 30 days and compliance observations shall be completed within 5 days of the Illinois EPA's request.

b. Silt Loading Measurements

i. The Permittee shall conduct measurements of the silt loading on various affected roadway segments and parking areas, as follows:

A. Sampling and analysis of the silt loading shall be conducted using the "Procedures for Sampling Surface/Bulk Dust Loading," Appendix C.1 in Compilation of Air Pollutant Emission Factors, USEPA, AP-42. A series of samples shall be taken to determine the average silt loading and address the change in silt loadings as related to the amount and nature of vehicle traffic and implementation of the operating program.

ii. Measurements shall be performed by the following dates:

A. Measurements shall first be completed no later than 30 days after the date that initial emission testing of the coke oven batteries is performed.

B. Measurements shall be repeated within 30 days in the event of changes involving affected

units that would act to increase silt loading (so that data that is representative of the current circumstances of the affected units has not been collected), including changes in the amount or type of traffic on affected units, changes in the standard operating practices for affected units, such as application of salt or traction material during cold weather, and changes in the operating program for affected units.

C. Upon written request by the Illinois EPA, the Permittee shall conduct measurements, as specified in the request, which shall be completed within 75 days of the Illinois EPA's request.

iii. The Permittee shall submit test plans, test notifications and test reports for these measurements as specified by Overall Source Condition 3.5, provided, however, that once a test plan has been accepted by the Illinois EPA, a new test plan need not be submitted if the accepted plan will be followed or a new test plan is requested by the Illinois EPA.

4.3.8 Monitoring Requirements

Monitoring requirements are not set for the affected units.

4.3.9 Recordkeeping Requirements

The Permittee shall maintain records of the following items for the affected units:

a. i. Records of the application of control measures as may be needed for compliance with the opacity limitations 35 IAC 212.316, including at least the following [35 IAC 212.316(g)(1) and (2)]:

A. The name and address of the source;

B. The name and address of the owner and/or operator of the source;

C. A map or diagram showing the location of all emission units controlled, including the location, identification, length, and width of roadways;

D. For each application of water or chemical solution to roadways by truck: the name and

location of the roadway controlled, application rate of each truck, frequency of each application, width of each application, identification of each truck used, total quantity of water or chemical used for each application and, for each application of chemical solution, the concentration and identity of the chemical.

E. For application of physical or chemical control agents: the name of the agent, application rate and frequency, and total quantity of agent and, if diluted, percent of concentration, used each day; and

F. A log recording incidents when control measures were not used and a statement of explanation.

ii. Copies of all records required by 35 IAC 212.316(g) shall be submitted to the Illinois EPA within ten working days after a written request by the Illinois EPA and shall be transmitted to the Illinois EPA by a company-designated person with authority to release such records.

b. The Permittee shall maintain records for each period of time when it relies upon the exemption provided by 35 IAC 212.314 to not comply with 35 IAC 212.301 or implement measures otherwise required by 35 IAC 212.304 through 212.310, or 212.312, with supporting documentation for the determination of wind speed.

c. The Permittee shall maintain records documenting implementation of the operating program required by Condition 4.3.3(c), including:

i. Records for each treatment of an affected unit or units:

A. The identity of the affected unit(s), the date and time, and the identification of the truck(s) or treatment equipment used;

B. For application of dust suppressant by truck: target application rate or truck speed during application, total quantity of water or chemical used and, for application of a chemical or chemical solution, the identity of the chemical and concentration, if applicable;

C. For sweeping or cleaning: Identity of equipment used and identification of any deficiencies in the condition of equipment; and

D. For other type of treatment: A description of the action that was taken.

ii. Records for each incident when control measures were not implemented and each incident when additional control measures were implemented due to particular activities, including description, date, a statement of explanation, and expected duration of such circumstances.

d. i. The Permittee shall keep records for the silt measurements conducted for affected units pursuant to Condition 4.3.7(b), including records for the sampling and analysis activities and results.

ii. The Permittee shall maintain records for all opacity measurements made in accordance with USEPA Method 9 for the affected units that the Permittee conducts or that are conducted on its behest by individuals who are qualified to make such observations. For each occasion on which such measurements are made, these records shall include the formal report for the measurements if conducted pursuant to Condition 3.5.1, or otherwise the identity of the observer, a description of the measurements that were made, the operating condition of the affected unit, the observed opacity, and copies of the raw data sheets for the measurements.

e. The Permittee shall maintain records for the PM emissions of the affected units to verify compliance with the limits in Condition 4.3.6, based on the above records for the affected units including data for implementation of the operating program, and appropriate USEPA emission estimation methodology and emission factors, with supporting calculations.

f. The Permittee shall maintain the following records related to emissions of fugitive particulate matter from affected units. As records of certain information are to be kept in a file, the Permittee shall review and update such information on a periodic basis so that the file contains accurate information addressing the current circumstances of the source.

i. A file that contains information on the length and state of road segments at the plant, the area and state of other open areas at the source traveled by

vehicles, and the characteristics of the various categories of vehicles present at the source as necessary to determine emissions.

ii. A file that contains information for the emission control efficiency or controlled emission factors (lb/vehicle mile traveled) achieved by the standard management practices implemented by the Permittee pursuant to its operating program for the various categories of vehicles on the road segments and open areas at the source, based on methodology for estimating emissions published by USEPA, with supporting explanation and calculations.

iii. For emission that are not controlled or for which emissions are determined by applying a control efficiency to an uncontrolled emission factor, information for the standard emission factors (lb/vehicle mile traveled) used for uncontrolled emissions for the various categories of vehicles on the road segments and open areas at the source, based on methodology for estimating emissions published by USEPA, with supporting explanation and calculations.

iv. Records of the estimated vehicle miles traveled on each roadway segment or other open area (miles/month, by category of vehicle), with supporting documentation and calculations. These records may be developed from the records for the amount of different materials handled at the source and information in a file that describes how different materials are handled.

v. Records for each period when standard management practices were not implemented, including a description of the event, an estimate of control measures that were present during the event and an estimate of the additional emissions that occurred during the event.

vi. Records for emissions, in ton/month, based on the emission factors and other information contained in other required records, with supporting calculations.

4.3.10 Reporting Requirements

a. Pursuant to 35 IAC 212.316(g)(1) and (5), the Permittee shall submit the following reports to the Illinois EPA related to the records required by 35 IAC 212.316(g)(1) and (2). (Refer to Condition 4.3.9(a))

i. A quarterly report including the information specified by 35 IAC 212.316(g)(5), including, but not limited to, those dates when controls were not applied based on a belief that application of such control measures would have been unreasonable given prevailing atmospheric conditions, which shall constitute a defense to the requirements of 35 IAC 212.316(g).

ii. An annual report containing a summary of the information in these records.

b. The Permittee shall promptly notify the Illinois EPA of deviations with permit requirements by affected units as follows. These reports shall contain the information specified in Condition 3.5.2, including a description of the probable cause of such deviations, any corrective actions taken, and preventive measures taken and be accompanied by the relevant records for the incident:

i. Notification within 30 days for any incident in which 35 IAC 212.301 may have been violated.

ii. Notification with the quarterly report for other deviations. (See also Condition 4.3.10(a)(i).)

5.0 ATTACHMENTS

Attachment 1: Project Emission Summary (Tons/Year)

Operation	NO_x	CO	SO_2	VOM	PM	PM_{10}	Lead	H_2SO_4
Gateway Coke Oven Project								
Charging	---	1.53	0.16	1.10	8.06	8.06	0.00006	---
Pushing	10.40	34.49	53.66	10.95	31.41	31.41	0.0084	2.74
Main Stack	547.50	114.65	997.33	24.57	124.00	124.00	0.085	10.17
Waste Heat Stacks	19.50	4.08	355.21	0.87	30.24	30.24	0.06	18.12
Quenching	---	---	---	---	65.70	24.09	0.048	---
Coal/Coke Handling & Storage	---	---	---	---	6.97	3.32	---	---
Coke Crushing/Screening	---	---	---	---	9.39	9.39	---	---
Roads	---	---	---	---	16.03	3.13	---	---
SUBTOTAL:	577.40	154.76	1,406.36	37.49	291.80	233.64	0.2	31.02
USS Conveyor Increase	---	---	---	---	0.95	0.45	---	---
SUBTOTAL:	577.40	154.76	1,406.36	37.49	292.75	234.09	0.20	31.02
Significance Threshold:	40	100	40	40	25	15	0.6	7
Greater Than Significant?	Yes	Yes	Yes	No	Yes	Yes	No	Yes

Attachment 2: Netting Analysis (Tons/Year)

	NO_x (NA NSR)	NO_x (PSD)	CO	SO_2	VOM	PM	$PM_{10}/PM_{2.5}$	Lead	H_2SO_4
Project Emissions	577.40	577.40	154.76	1,406.36	37.49	292.75	234.09	0.20	31.02
Contemporaneous[a] Increases									
BFG Boiler/Flare (06070023)	124.74	124.74	338.36	451.14	0.92	232.25	232.25	---	---
NG Enrichment (04110018)	17.22	17.22	5.17	0.04	0.34	0.73	0.62	---	---
Slab Furnaces (06070022)	---	---	26.77	---	1.75	43.43	43.43	---	---
Contemporaneous[a] Decreases									
Boilers 1-10 (06070022)	-278.89	-278.89	-313.61	-789.43	-1.22	-228.06	-228.06	---	---
COG Desulf. (06070022)	---	---	---	-2,107.95	---	-94.15	-94.15[b]	---	-63.11
Slab Furnaces (06070022)	-427.94	-427.94	---	-174.15	---	---	---	---	---
No. 6 Galv. Line (06070023)	-38.48	-38.48	-10.36	-0.07	-0.68	-0.94	-0.94	---	---
No. 4 COG Pump (06070023)	-77.30	-77.30	-117.97	-0.02	-0.99	-0.64	-0.64	---	---
NET EMISSIONS CHANGE	-103.25	-103.25	83.12	-1,214.08	37.61	245.37	186.60	0.20	-32.09
Significance Threshold:	40	40	100	40	40	25	15	0.6	7
Greater Than Significant?	No	No	No	No	No	Yes	Yes	No	No

Notes:

[a] The contemporaneous time period for PSD pollutants is April 2002 through July 2008. The contemporaneous time period for NA NSR pollutants is July 2001 through July 2008.

[b] The COG desulfurization project (excludes Boilers 1-10 shutdown and Slab Furnaces) results in a contemporaneous PM/PM_{10} emission decrease of 94.15 tons. 31.74 tons of this decrease is being relied upon for use as an offset. This portion of the decrease is no longer available, e.g., future netting transactions.

CPR:jws

Attachment 3: Summary of BACT/LAER Determinations

Operation	Permit Condition	BACT Determination for PM and PM_{10} Control Technology/Emission Limit	LAER Determination for $PM_{2.5}$ Control Technology/Emission Limit as PM_{10}
Charging	4.1.5	Baghouse with traveling hood (0.016 lb/ton coal).	Baghouse with traveling hood (0.016 lb/ton coal).
Coking - Main Stack	4.1.5	Baghouse (0.008 and 0.011 gr/dscf for filterable and total particulate, respectively).	Baghouse (0.008 and 0.011 gr/dscf for filterable and total PM_{10}, respectively).
Coking - Waste heat stacks	4.1.5	Work practices (0.08 gr/dscf).	Work practices (0.08 gr/dscf).
Pushing	4.1.5	Flat car push with multicyclone (0.08 lb/ton coke).	Flat car push with multicyclone (0.08 lb/ton coke).
Quenching	4.1.5	Baffles and cleaned water (0.044 lb/ton coal).	Baffles and cleaned water (0.044 lb/ton coal).
Coke Crushing & Screening	4.2.5	Enclosure and baghouse (0.005 and 0.008 gr/dscf for filterable and total particulate, respectively).	Enclosure and baghouse (0.008 and 0.011 gr/dscf for filterable and total PM_{10}, respectively).
Roads, Storage Piles and Other Sources of Fugitive Dust	4.3.5	Paving, Watering	Paving, Watering

Attachment 4: Standard Permit Conditions

STANDARD CONDITIONS FOR CONSTRUCTION/DEVELOPMENT PERMITS
ISSUED BY THE ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

The Illinois Environmental Protection Act (Illinois Revised Statutes, Chapter 111-1/2, Section 1039) authorizes the Environmental Protection Agency to impose conditions on permits, which it issues.

The following conditions are applicable unless superseded by special condition(s).

1. Unless this permit has been extended or it has been voided by a newly issued permit, this permit will expire one year from the date of issuance, unless a continuous program of construction or development on this project has started by such time.

2. The construction or development covered by this permit shall be done in compliance with applicable provisions of the Illinois Environmental Protection Act and Regulations adopted by the Illinois Pollution Control Board.

3. There shall be no deviations from the approved plans and specifications unless a written request for modification, along with plans and specifications as required, shall have been submitted to the Illinois EPA and a supplemental written permit issued.

4. The Permittee shall allow any duly authorized agent of the Illinois EPA upon the presentation of credentials, at reasonable times:

   a. To enter the Permittee's property where actual or potential effluent, emission or noise sources are located or where any activity is to be conducted pursuant to this permit,

   b. To have access to and to copy any records required to be kept under the terms and conditions of this permit,

   c. To inspect, including during any hours of operation of equipment constructed or operated under this permit, such equipment and any equipment required to be kept, used, operated, calibrated and maintained under this permit,

   d. To obtain and remove samples of any discharge or emissions of pollutants, and

   e. To enter and utilize any photographic, recording, testing, monitoring or other equipment for the purpose of preserving, testing, monitoring, or recording any activity, discharge, or emission authorized by this permit.

5. The issuance of this permit:

   a. Shall not be considered as in any manner affecting the title of the premises upon which the permitted facilities are to be located,

   b. Does not release the Permittee from any liability for damage to person or property caused by or resulting from the construction, maintenance, or operation of the proposed facilities.

   c. Does not release the Permittee from compliance with other applicable statutes and regulations of the United States, of the State of Illinois, or with applicable local laws, ordinances and regulations.

   d. Does not take into consideration or attest to the structural stability of any units or parts of the project, and

   e. In no manner implies or suggests that the Illinois EPA (or its officers, agents or employees) assumes any liability, directly or indirectly, for any loss due to damage, installation, maintenance, or operation of the proposed equipment or facility.

6a. Unless a joint construction/operation permit has been issued, a permit for operation shall be obtained from the Illinois EPA before the equipment covered by this permit is placed into operation.

b. For purposes of shakedown and testing, unless otherwise specified by a special permit condition, the equipment covered under this permit may be operated for a period not to exceed thirty (30) days.

7. The Illinois EPA may file a complaint with the Board for modification, suspension or revocation of a permit.

   a. Upon discovery that the permit application contained misrepresentations, misinformation or false statement or that all relevant facts were not disclosed, or

   b. Upon finding that any standard or special conditions have been violated, or

   c. Upon any violations of the Environmental Protection Act or any regulation effective thereunder as a result of the construction or development authorized by this permit.

JMS:06070020:jws

Project No. 08004

Revision 4
Specification No. GRC-52-4S-001

SPECIFICATION

For

DESIGNING AND FURNISHING OF

FLUE GAS DESULFURIZATION AND MERCURY CONTROL SYSTEM

For

GATEWAY ENERGY AND COKE COMPANY

At

GRANITE CITY, MADISON COUNTY, ILLINOIS

NOT FOR CONSTRUCTION

Written By: _____ **Date:** _____

Reviewed By: _____ **Date:** _____

Approved By: _____ **Date:** _____

Industry and Energy Associates, LLC
27 Pearl Street
Portland, ME 04101
Phone (207) 541-5800
Fax (207) 541-5990
COA: #184-005194

industry and energy associates

Revision Index

Revision Level	Description	Date
0	Issued for Bid	August 15, 2006
1	Changed responsibility matrix Changed 1.3, Electrical description	September 6, 2006
2	Issued for Conformance	February 28, 2008
3	Revised Conformance	April 11, 2008
4	Revised Conformance	April 25, 2008

TABLE OF CONTENTS:

1 SCOPE OF WORK

1.1 Work Included in the Supplier's Scope

This specification covers the minimum requirements for the design, manufacture, supply, and delivery of one Flue Gas Desulfurization System (FGD) complete with all accessories as hereinafter specified. The work shall include all necessary and/or usually supplied equipment and appurtenances for the safe, efficient, and convenient operation of the FGD within the scope of this Specification.

For the FGD system the Supplier shall provide necessary auxiliaries and features including but not limited to the following:

a. Design, materials, fabrication, and shop assembly to include:

- Inlet and bypass duct,
- Dampers
- Spray Dryer Absorber (SDA)
- Fabric Filter
- Lime Slurry Preparation System
- Ash Collection System
- ID Fans
- Mercury (Hg) Abatement system
- Control System
- Steel support structure
- Access stairs, platforms, and walkways
- Insulation (Design by Supplier, Supply by Buyer)
- Siding (Design by Supplier, Supply by Buyer)
- Lighting
- Shop painting
- Interconnecting piping and ducting to terminal points

b. Shipping preparation, loading and securing on carrier.

c. Shipment to the job-site.

d. Submittal of drawings, data, and documents.

e. Expediting of materials, equipment, and submittals.

f. Inspection, examination, and shop testing.

g. FGD operations training.

h. Supplier and supplier services during construction, start-up, and commissioning.

i. Field Service Advisors for erection, start-up, commissioning, and training.

j. Sub-Supplier service advisors for erection, start-up, commissioning, and training.

1.2 Work to be Provided by Others

a. Receiving, unloading, storing and installing of equipment

b. Field erection of FGD systems

c. Construction of foundations, furnishing and installing foundation anchors.

d. Site subgrade electrical grounding grid

e. Piping and ducts beyond specified terminal points

f. Supply and Installation of heat tracing, external insulation, and lagging.

g. Electrical and Mechanical interconnections between assemblies.

1.3 General Division of Responsibilities

The following general division of responsibility shall be representative, but shall not limit the Supplier supply as further specified herein.

		Furnished By	
		Supplier	**Buyer**
I	**FGD System**		
1	Controls		
2	System Control Descriptions and/or Control Logic Diagrams	X	
3	Walkways and Platforms necessary to access all access ways, instrumentation, and valves.	X	
4	All other instrumentation necessary for operation of the furnished equipment.	X	
5	All large bore (above 2" NPS) integral and interconnecting piping, fittings, supports, and hardware on skid mounted furnished under this specification.	X	
6	All small bore (2" NPS and below) interconnecting piping, fittings, supports, and hardware.		X
7	Motor starters and Motor Control Centers for ALL Motors associated with FGD and electrical interconnects, excluding ID Fan Motors		X
8	Equipment and structure lightning protection and grounding systems.	X	(for connection to Buyer's Grounding Grid)
9	Subgrade electrical grounding grid.		X
10	FGD Structure lighting, including lighting transformers and panelboard (internal to provided enclosures)	X	
11	Structural steel supports for equipment.	X	
12	Galvanizing.	X	Labor for touch up of field connections
13	Corrosion coatings for bag cages and clean air plenum walls and manifolds	X	
14	Corrosion coupons	X	
II	**Spray Dryer Absorber**	X	
1	Spray Dryer Vessel	X	
2	Spray Dryer Hopper.	X	
3	Inlet Gas Disperser duct.	X	
4	Rotary Atomizers Assemblies with closed loop water cooling system	X	
5	Weather Enclosure for Roof including hoist and trolley system.	X	
6	Support Structure (SDA & FF)	X	
7	SDA Bypass Duct.	X	

		Furnished By	
		Supplier	**Buyer**
8	Expansion Joints	X	
III	**Fabric Filter Assembly**	X	
IV	**Lime Slurry Preparation System**		
1	Lime Storage Silo including unloading station from Buyer's pneumatic tanker trailer.	X	
2	Bin vent filter.	X	
3	Paste or Detention type Slakers.	X	
4	Rotary Screw Lime Feeder System.	X	
5	Lime Slurry Tank.	X	
6	Lime Slurry Feed Pumps.	X	
7	Reagant Prep Housing.	X	
V	**Ash Handling System (Vacuum)**		
1	Air Blower(s).	X	
2	Aeration Unit.	X	
3	Ash Unloader Station (into Buyer tanker trailer).	X	
4	Ash Silo.	X	
5	Vent Fan.	X	
6	Transport piping.	X	
VI	**ID Fans**		
1	ID Fans with closed loop oil cooling system.	X	
2	Inlet/Outlet transition duct to/from fans with inlet/outlet louver dampers for pressure and flow control.	X	
3	Expansion Joints: Combined ducting from Outlet of ID Fan / Ductwork to Stack.	X	
4	I.D. Fans Vibration Monitors	X	
5	I.D. Fans Bearings High Temperature Monitors	X	
VII	**Mercury (Hg) Abatement System**	X	
VIII	**Construction**		
1	Assembly, Setting, Alignment and Grouting of Equipment Embeds.	Design	Install & Supply
2	Foundations & Civil Work.		X
3	Slide plates and base plates	X	
4	Leveling blocks, thrust blocks, slotted washers, and all other non-embedded items anchor bolt templates.		X
5	All imbedded items, including anchor bolts (foundation rebar by Buyer).	Design	X
6	Field Erection Labor		X
7	One set of special tools for maintenance and one set of lifting instructions for off-loading.	X	
8	Vendor and supplier services during construction, start-up, and commissioning per contracted quantity.	X	
9	Field Service Advisors for erection, start-up, commissioning, and training per contracted quantities.	X	
10	Piping and duct beyond specified terminal limits.		X
11	Heat tracing, external insulation and lagging.	Design/Specify	Supply & Install

		Furnished By	
		Supplier	**Buyer**
12	Interconnection between assemblies: Tubing, wiring, conduit, cable, and cable trays.		X
13	Field Installed Components: External insulation and lagging for field installed piping, valves, and duct sections.	Design/Specify	Supply & Install
14	Bolts, nuts, and gaskets at terminal points.		X
15	Sub-Supplier Start-up and Commissioning Support per contract	X	
16	Construction and commissioning services per contract.	X	
IX	**Miscellaneous**		
1	Shop testing including functional testing of equipment specified.	X	
2	Commissioning Spare Parts.	X	
3	Suggested Spare Parts (2 Years) with pricing.	X	
4	FGD Operators Training.	X	
5	Documentation and Data including Instruction & Operation Manuals, QA/QC program, monthly status report, and drawings including as-builts per mark-ups provided by Buyer's construction contractor	X	
X	**Freight**		
1	Delivery of all equipment FOB to Site, Granite City, IL, USA (Unloading by Buyer).	X	
2	Delivery of all components that are shipped by barge FOB to dock near site (Unloading by Buyer).	X	

1.4 Terminal Points

The Supplier's scope shall include all items within the following terminal points and as described herein. Terminal locations shall be provided for the items shown below.

System	Terminal Point
Exhaust Gas	Flanged connection upstream of FGD System Inlet Duct Transition and downstream of the I.D. Fans at the main stack expansion joint outlet connection flange.
Utilities	Pebble lime feed connection at lime unloader station on silo.
	Ash waste connection at ash discharge.
	Buyer to supply Instrument Air to all instruments and valves.
	Large bore (above 2" NPS) slaking and dilution water piping connection to Buyer's service water main supply to be within 20' of lime preparation equipment. Buyer to provide all small bore piping (2" NPS and below).
Electrical*	Electrical power to Buyer's supplied Motor Control Centers (MCC) and medium voltage motor starters
Control*	Remote instrument and signal connections.

*All interconnecting power, instrumentation and control wiring materials are supplied by the Buyer

1.5 Definitions

Abbreviations are defined as follows:

AOV	Air operated valve
CEG	Combustion exhaust off-gas
CEMS	Continuous emissions monitoring system
GTAW	Gas tungsten arc welding
HRSG	Heat recovery steam generator
MCC	Motor control center
MDL	Master Document List
MOV	Motor operated valve
NDE	Non-destructive examination
NPS	Nominal pipe size
P&ID	Piping and instrumentation diagram
PLC	Programmable logic controller
PCS	Plant control system
PWHT	Post weld heat treatment
SAW	Submerged arc welding
SMAW	Shielded metal arc welding
UV	Ultraviolet

2 CODES AND STANDARDS

Design, materials and workmanship of the equipment specified within this specification, including the various accessories furnished herewith, shall fully comply with the latest editions of all local, state and federal laws, codes and regulations. The following listed standards and codes shall govern the design and selection of equipment and material supplied.

Design criteria to be used for the analysis and design of the foundation(s), including final loads and load orientation and acceptable deflections with details for all equipment. These design criteria shall be at a minimum in accordance with the 2006 International Building Code (IBC).

AFBMA Anti-Friction Bearing Manufacturers Association

AGMA American Gear Manufacturers Association

AISC American Institute of Steel Construction
- Code of Standard Practice for Steel Buildings and Bridges.
- Specification for Structural Joints Using ASTM A 325 or A 490 Bolts.
- Manual of Steel Construction.
- Specification for the Design, Fabrication, and Erection of Structural Steel for Buildings.

AISI American Iron and Steel Institute

ANSI American National Standards Institute

ASCE American Society of Civil Engineers
- ASCE 7-02 Minimum Design Loads for Buildings and Other Structures.

ASME American Society of Mechanical Engineers
- B 31.3 Process Piping
- A 13.1 Scheme for the Identification of Piping Systems
- B 16.25 Buttwelding Ends

ASNT	American Society for Nondestructive Testing – NT-TC-1A Recommended Practice, Personnel Qualification, and Certification
ASTM	American Society for Testing and Materials – A 123 Zinc (Hot Dip Galvanized) Coatings on Iron and Steel Products – A 153 Zinc (Hot Dip Galvanized) Coatings on Iron and Steel Hardware
AWS	American Welding Society – D1.1 Structural Welding Code – Steel
EJMA	Expansion Joint Manufacturing Association
EPA	Environmental Protection Agency
IBC	International Building Code, 2006
IEEE	Institute of Electrical and Electronics Engineers
ISA	Instrumentation, Systems and Automation Society
NACE	National Association for Corrosion Engineers
NEC	National Electric Code
NEMA	National Electrical Manufacturer's Association
NESC	National Electric Safety Code
NFPA	National Fire Protection Association
OSHA	Occupational Safety and Health Administration
SSPC	The Society for Protective Coatings

3 DESCRIPTION OF WORK

The Gateway Energy & Coke facility will consist of 120 coke ovens and ancillary equipment using Sun Coke's patented technology. The facility will operate on a 48-hour coking cycle, which requires 60 ovens to be pushed and charged with up to 50 tons of wet coal every day. The coke ovens produce two products, metallurgical coke and waste heat in the form of hot flue gas. The heat recovery and FGD system will be constructed to:

- Provide a continuous, stable draft (negative pressure) on the coke battery,
- Generate steam from the hot flue gas utilizing HRSGs (by others)
- Remove sulfur dioxide, particulate and mercury from the cooled gases.

The HRSGs will recover heat from the coke ovens 24 hours per day, 365 days per year. Cooled flue gas from the HRSGs is transferred through a "cold" duct to the FGD system purchased under this specification. The purpose of this FGD System is to remove particulate matter, sulfur dioxide (SO_2), and mercury (Hg) from the flue gas before it is exhausted to the atmosphere. The SO_2 and particulate removal portions of the FGD System will consist of a spray dryer/absorber (SDA), a fabric filter (baghouse), a neutralizing reagent preparation operations (pebble lime silo, lime slakers, and lime storage/feed tank). The mercury (Hg) abatement system will consist of a carbon injection system and a carbon silo. The carbon will be injected downstream of the HRSGs after the last connection from the last HRSG into the cold duct, and prior to the SDA portion of the FGD. Induced draft (ID) fans will provide the motive force for the flue gas from the ovens, through the HRSGs and FGD System, and out an exhaust stack. Waste dust collected in the SDA hopper should discharge by gravity to Buyer furnished collection bins. Waste dust collected from the baghouse will be pneumatically conveyed to the waste silo for transfer into a trailer truck. The Coke Facility will be operated nearly 100% of the time. Redundancy of critical systems (atomizers, slakers, baghouse compartments, and multiple ID fans) will be as specified herein to insure high FGD system availability. Reinforced concrete foundations will be provided by the Buyer for the SDA, the baghouse, the ID fans, the exhaust stack (by others), storage silos and other FGD System equipment. A bypass duct shall be provided around the SDA by the Supplier. The Supplier

shall provide separate pricing on a reimbursable basis for each of the following items in the event the Buyer wishes to purchase additional service time than that included in the contract:

a construction advisor;

commissioning assistance; and,

Supplier (and Sub-Supplier) services during construction and commissioning.

In addition, the Supplier shall provide the recommended durations for each activity and a description of their services. Major system component requirements are detailed below.

3.1 Spray Dryer Absorber (SDA)

The spray dryer absorber is where the finely atomized lime slurry contacts the flue gas. The design shall be such that the slurry droplets are thoroughly mixed with the gas. The droplets are produced by an atomizer. The supplier is responsible for the design of the atomizer to produce the properly sized droplets at the rate required to react with the incoming SO_2. The following requirements apply to the SDA system.

a. The SDA shall have multiple atomizers, sized to allow for treatment of 100% of the flue gas capacity with one unit out of service. One spare atomizer unit shall be supplied so that maintenance may be performed while the SDA operates at full capacity.

b. SDA design conditions are listed in Attachment A, Table 2, FGD Design Summary.

c. The SDA material of construction shall be carbon steel. The top of the SDA shall be provided with a weather enclosure (penthouse) housing the hoist and trolley system with ventilation, heating, doors, lighting and convenience electrical outlets (outlets by Buyer).

d. All hot surfaces shall be insulated with a minimum of 6 inches of mineral wool insulation and lagged with a minimum of 20 ga. ribbed aluminum lagging (by Buyer)

e. The SDA/baghouse system shall be designed for a minimum 90% SO_2 removal efficiency for coals with a dry sulfur content ranging from 0.5% to 1.1% and shall meet the permit SO_2 output requirement for the entire range of performance criteria and for the guaranteed design case (24.5% VM) for the extent of the warranty period.

f. The SDA shall be designed to a mechanical integrity temperature of 500°F and pressure of +5/-30 inches of water. The Spray Dryer Absorber shall operate in a minimum range of 95 to 115°F above the saturation temperature subject to the Supplier's recommendations regarding flue gas HCL content.

g. The Spray Dryer Absorber vessel shall have gas inlet, gas outlet and ash discharge flanges.

h. The Spray Dryer Cone hopper shall be provided with two strike plates, two (2) 4-inch diameter poke holes, one (1) ash high level sensor, one (1) set of thermostatically controlled hopper heaters and one insulated 24-inch square access door. Cone hopper dust discharge with 24-inch dual slide gates or Supplier's recommended option.

i. Gas inlet disperser vanes shall be abrasion resistant steel.

j. SDA bypass duct with two isolation guillotine dampers, expansion joints, and support steel shall be provided to allow full gas flow around the SDA.

k. SDA inlet shall include test ports on inlet for sampling and testing and test access platforms and ladders.

l. SDA inlet duct shall be of height to match with Buyer's connecting ductwork.

m. Isolation guillotines shall have position indicators to show when in the open or closed position.

n. The Supplier shall provide the Gas Retention time (with the bid proposal) at the average and maximum gas flow rate (as measured at the center of the outlet duct of the SDA).

o. A motorized hoist and trolley system shall be provided to service all atomizers and provide the capability to lower the atomizer units to grade.

p. Supplier will specify the typical cleaning frequency for the atomizers based on normal system operating conditions.

3.2 Fabric Filter

The Fabric filter baghouse, is the particulate removal device for the flue gas stream. This device will be located downstream of the SDA and will collect the carryover fly-ash, dried calcium sulfate/sulfite and excess calcium hydroxide and other products from the SDA as well as the carbon from the mercury (Hg) abatement system. The following requirements apply to the Fabric Filter system.

a. The baghouse design shall include multiple compartments to allow for bag changing in off-line compartments while the system is operational.

b. An on-line cleaning system shall be provided to reduce pressure drop through the system and to facilitate removal of the captured solids mix to the bottom of the baghouse for subsequent conveyance to the waste ash silo.

c. The Supplier shall provide the air-to-cloth ratio (acfm: ft^2) anticipated for their unit with the bid proposal.

d. The dust collection hoppers of the baghouse shall be insulated and shall have heaters to prevent cold-end corrosion. Insulation provided and installed by Buyer.

e. The fabric filter must remove at least 99% of the particulate. PPS fabric material shall be used for the filter bags. Fabric Filter to include;

- Filter with cages constructed of epoxy coated carbon steel, including 1% spares for bags and cages
- Pulse cleaning system complete with 2 x 100% capacity cleaning air blowers or equivalent design.
- All controls and standard instrumentation required for the filter to operate
- Compartment inlet/outlet and bypass dampers
- Appropriate, automated valve connection to pneumatic ash conveying system.

f. The baghouse system shall incorporate into the design, an additional 3% flow design allowance for air leakage into the system. This margin shall be above the maximum allowable flow rate through the system.

g. Each compartment shall be capable of "off line" cleaning at low flow rates. Cleaning shall be activated by pressure or a timer signal. On-line cleaning is normal operation.

h. All hot surfaces shall be designed to be insulated with a minimum of 6-inches of mineral wool insulation and lagged with a minimum of 20 ga. ribbed aluminum lagging. Insulation by Buyer

i. The filter baghouse pyramidal hoppers shall be provided with one strike plate, two 4-inch diameter poke holes, one ash high level sensor, one set of thermostatically controlled hopper heaters and one insulated access door (insulated by Buyer).

j. The fabric filter shall contain an internal bypass.

k. The baghouse design shall include all necessary structural components (girts, sag rods, connections, etc.) for enclosing the area underneath the baghouse with the exception of the siding (to be provided by others).

l. The baghouse will have corrosion coupons located in the different compartments. The location of the corrosion coupons and materials of construction shall be recommended by Supplier. Coupons should be easily accessible for inspection. At least one coupon shall be epoxy coated.

m. The baghouse compartments, components, and cages will be designed to withstand normal corrosion under all specified operating conditions.

n. Supplier shall specify and supply corrosion protection for areas downstream of the SDA under all normal operating conditions (i.e. baghouse clean air plenum and cleaning air manifold epoxy coating).

o. Supplier shall list all operating restrictions for normal operating conditions and bypass mode.

3.3 Lime Slurry Preparation System

Calcium oxide (pebble lime) will be delivered by truck to the site. The pebble lime is to be pneumatically conveyed for storage in a silo. The lime will be transferred to a slaker system where a hydrated lime slurry will be prepared for use in the rotary atomizers. The following requirements apply to the Lime Slurry Preparation system.

a. The Lime silo shall be sized for a seven-day supply of lime at 24.5% VM coal average flow and average SO_2 conditions. The silo shall be designed to support a bin vent filter. Bin vent system shall be sized with a discharge rate less than 2.5 fpm and shall be guaranteed to remove 99% of all particles one micron and larger. A caged ladder or alternative access shall be provided to a top access manhole. The silo shall be provided with a pressure relief valve.

b. Pebbled lime, which has the following characteristics, will be supplied by the Buyer to be used as the reagent:
   - Particle size: ¾ inch with no more than 20% less than 40 mesh,
   - Availability: 93% as CaO or greater, as measured by ASTM Method C25
   - MgO is 2.1%
   - Reactivity; 40°C temperature rise or greater at three minutes as measured by ASTM Method C110.

c. Slaking water will be provided by the Buyer in accordance with the water quality provided in Attachment D.

d. The slaker system shall consist of a feeder, a slaker and a hydrated lime (calcium hydroxide) slurry storage tank used for the purpose of converting the quick lime into hydrated lime. The slaker system shall include a grit removal screw and chute. The slaker system, except for the slurry storage tank, shall be 100% redundant and designed to handle all cases.

e. The slaker piping and control valves must be designed to operate at 100% of maximum design flow at 90% capacity.

f. The lime silo shall have a dust collector to facilitate solids capture during pneumatic conveying of the lime into the silo. A terminal connection at the silo shall be provided to allow lime delivery from a pneumatic truck blower. The silo will have an activator to help promote the flow of the lime from the silo for transport to the slaker system.

g. This system design will include monitoring of the levels and temperatures of the silo and various tanks, as applicable.

h. The silo shall be provided with a vibrating hopper cone bottom and rotary or screw type volumetric feeders to deliver pebble lime from the lime storage silo to the slakers.

i. The lime slurry tank shall be sized for 12 hours of slurry storage at design operation of 24.5% VM coal, average flow and average SO_2 conditions. Ultrasonic level probe with controls and agitator and motor shall be provided with the tank. Only one (1) tank shall be provided.

j. Redundant lime slurry feed pumps and slurry hose loops, rated for 800 PSI, plaster and concrete service, each designed at 100% of design flow, complete with manual isolation and flushing valves and quick disconnect connections shall be provided to deliver lime slurry to the atomization equipment. The system shall include flow meters, pressure transmitters and control valves on the lime and dilution lines in the SDA penthouse to allow remote monitoring.

k. The lime silo shall be provided externally primed and unpainted, if field welded, finish painted if bolted design.

3.4 Ash Handling and Removal System

a. An ash waste collection system shall be provided to collect and store ash and waste materials collected from the fabric filter hoppers including the carbon from the Hg abatement system. All waste shall be conveyed and stored in an ash silo.

b. The ash silo shall be sized for seven days of waste storage based on 24.5% VM coal average flow and average SO_2 conditions.

c. The ash waste collection system shall be a vacuum based conveying system.

d. The ash shall be conveyed to an ash storage silo with a trailer unloading station which shall be provided by the Supplier as part of the waste handling system. The ash storage silo and support steel shall allow truck clearance below the silo truck fill spout and bin activator.

e. The silo shall be designed to support a bin vent filter. Bin vent system shall be sized with a filter speed of not more than 2.5 fpm and be guaranteed to remove 99% of all particles one (1) micron and larger.

f. The silo shall be designed for field welded or bolted erection unless the waste storage volume is such that the Supplier recommends using a concrete tank (slip form).

g. Waste materials discharged from the SDA hopper will be collected in temporary storage bins supplied by the Buyer.

3.5 ID Fans and Draft Control System

a. The fans create induced draft in the coke ovens to provide enough air for combustion of coal volatile matter and excess air for stable temperature control. The design must provide for continuous operation, so redundant fan capacity is required. Three fans, each capable of operating at 50% of the total flow (two operating, one spare) shall be provided.

b. The Supplier shall select and size the fan system for a total fan pressure that includes the pressure drop of the SDA, the bag house, ductwork and stack losses at design flow rates while maintaining the maximum vacuum pressure at inlet interface to the FGD system at a design value of (–13 inch WC). The stack losses shall be based on a 13'-0" inside diameter by 200 foot high from the base stack for Design Case 4 in Table 2, FGD Design Summary.

c. The ID fan control logic provided by the Supplier shall allow for the control and setpoint adjustment of the SDA inlet pressure at the design flow basis (Attachment A, Table 2).

d. Inlet and outlet louver dampers shall be provided as required to meeting the control requirements.

e. Each fan shall be isolated with an inlet and outlet guillotine style damper.

f. Dampers must be able to full stroke in three (3) minutes under full system pressure

g. Fan bearings shall utilize oil cooling.

h. The selected fans must have a minimum of 8% volume and 12% pressure available above design capacity (i.e. maximum gas flow with the SDA in service).

i. Adequate silencing of all equipment shall be provided to limit noise levels to a maximum of 85 dBA at 3 feet at all locations. Supplier shall provide recommended insulation design to meet this requirement.

j. Supplier is to provide the design/maximum fan RPM and associated fan curves.

k. Supplier shall provide high temperature monitors on the bearings. These devices shall be capable of transmitting an alarm remotely via the control system.

l. Supplier shall provide vibration monitoring devices for the ID fans. These devices shall be capable of transmitting an alarm remotely via the control system.

m. The ID fans shall be capable of operating under a full bypass of the SDA vessel and baghouse under all normal and design operating cases. Design considerations shall be made for start-up and bypass modes (1/6 flow conditions) in order to accommodate increased fan temperatures and uncontrolled emissions in the flue gas.

3.6 Mercury (Hg) Abatement System

a. Supplier shall provide a complete Hg abatement system designed for a maximum activated carbon injection rate of 10 lbs/MMACFM and shall be capable of an operating range of 0 to 10 lbs/MMACF.

b. System shall include the powder activated carbon silo, feeder and metering system and all necessary control equipment for proper injection and dispersion into the FGD inlet transition duct upstream of the SDA vessel.

c. The storage silo shall be sized for a 60,000 lbs powder activated carbon capacity based on a bulk density of 32 lb/cu. ft.

4 QUALITY ASSURANCE

a. Design, materials and workmanship of the equipment, including the various accessories furnished herewith, shall fully comply with the requirements of the latest editions of all state and federal laws, codes and regulations.

b. Personnel performing NDE shall be qualified in accordance with NT-TC-1A. Qualification records and the written procedure for qualification shall be available for review.

c. Materials used in construction of all equipment shall be new and free from defects.

5 GENERAL CRITERIA

a. Use modular fabrication and delivery as much as possible. All components shall be assembled to the maximum amount possible (subject to shipping limitations) and shall be suitable for and where necessary, specially treated and processed for delivery, storage and service under the site conditions. See Specification No. GRC-00-1S-002 for Project Site Conditions.

b. Structural components shall conform to AISC. Structural welding shall conform to AWS D1.1.

c. Electrical components shall be designed, built and tested in accordance with applicable NEMA and IEEE standards.

d. Utility piping systems shall conform to ASME B31.3 Process Piping.

5.1 Design and Materials General Requirements

a. The FGD and Hg abatement system will be located outdoors. The work shall successfully meet and withstand all continuous loads, operating cycle transitions, start-up, shut-down, stand-by, and idle conditions resulting from the coke oven operations.

b. The FGD Supplier must state the origin of all foreign materials and fabrication planned for this project.

c. Permanent local piping or flexible rubber hose (larger than 2-inch NPS), valves, flanges, fittings, bolting, gaskets, instruments, trim, controls, and accessories required for operation, control and safeguarding shall be provided by Supplier unless specifically stated to be provided by the Buyer. All ASME and specified requirements shall be incorporated. Asbestos materials are prohibited and shall not be used.

5.2 Insulation, and Lagging

a. The Supplier shall design the equipment to accommodate the following insulation requirements. The Buyer based on Supplier provided design requirements will supply and install the insulation.

b. Exhaust gas path insulation design shall be based on a 140°F external surface temperature at 80°F ambient temperature and 1 mph wind. Exhaust gas path surfaces (including fans) that may be touched by personnel during normal operation or maintenance activities shall not exceed 140°F. Personnel Protection shall extend 8 feet above grade or platform floor. Insulation shall be proven in operation under similar applications. A minimum of 6 inches of insulation shall be used for all components in contact with the exhaust gas stream.

c. Joints in multiple layer insulation systems shall be staggered. The liner shall be overlapped in the direction of the flow and from top to bottom.

d. Access doors in insulated sections shall have insulation and liners equivalent to the adjacent sections.

5.3 Structure and Duct

a. The inlet duct and supporting structure will be provided to an interface point upstream of the carbon injection system. Flange interface requirements shall be provided by the Supplier. The CEG path provided by the Buyer and Seller shall be a pressure tight envelope with seals or expansion joints at CEG path penetrations. Four sampling ports

shall be installed upstream of the SDA vessel and carbon injection point with adequate upstream and downstream duct length from any transitions or flow disturbances. The sampling ports are to be oriented in the duct quadrants and all penetrations to be used for sampling and/or environmental monitoring shall be 4" NPS minimum.

b. All structural steel support, base plates, slide plates, and guide bars required for the work shall be provided.

c. If applicable, drains shall be provided at all low points in the exhaust gas duct. Sleeves shall be provided for drains in insulated sections. Sleeve material shall be equivalent to the duct material. Drains shall be 2 inch NPS minimum.

d. Lifting lugs and stiffening members shall be provided for off-loading except where slings or similar devices are suitable for handling and field erection.

e. Heat flow from the Supplier's work shall not cause foundation concrete temperatures to exceed 140°F.

f. If applicable, drain holes shall be provided in structural members to drain trapped rainwater in outdoor installations.

g. Materials shall be adequate for all load conditions and for the lowest design ambient temperature when the FGD is not in operation.

h. Permanent structural materials shall conform to the following ASTM requirements.

Duct Casing plate	A36 or A572 grade 50 or JIS G3101 SS400 Carbon Steel
Structural Steel	A36, A992 or A572 grade 50 or JIS G3101 SS400 Carbon Steel
Structural Pipe	A53 Type E or S, GrB, *
Pipe Handrail	A120, sch 40 *
Common Bolts	A307 Gr A
High Strength Bolts	A325 Type I
Structural Tubing	A500 Gr B
Common Nuts	A563 Gr A, hardened washers
High Strength Nuts	A563 Gr DH, heavy hex hardened washers

* Or Buyer approved equal.

5.4 Structural Design

a. The structural design shall control and accommodate the direction of thermal expansions.

b. All applicable load conditions during shipment, erection, and operation shall be included in the design.

c. Maximum beam deflections as a fraction of span for walkways and platforms shall be 1/240 and for major equipment support shall be 1/500.

d. Field bolted connections for slip-critical connections shall include high strength bolts and nuts with threads included the shear planes. Major moment connections where ductility is required shall be field bolted for shear and field welded for moment. Snug tight high strength bolted connections may be utilized for non-slip critical connections. High strength bolts shall be 3/4 inch minimum diameter. Secondary or lightly loaded field connections shall be with 5/8 inch diameter common bolts and nuts.

e. The minimum requirements for connections shall be shop welded and field bolted AISC Framed Beam Connections, Tables II and III as shown in the AISC Manual of Steel Construction. The minimum gusset plate thickness shall be 3/8 inch. Columns shall have

full bearing at splices and at end plates. Bolts shall project through nuts at least two full threads.

f. The Supplier shall determine anchor bolt material, diameter, bolt location, length, and projection above the bottom of base plates. The Buyer shall provide fabrication and installation of anchor bolts.

g. SDA and baghouse plate thickness shall not be less than 6 mm. Ductwork plate thickness shall not be less than 3/16 inch or 5 mm.

h. Opening reinforcement shall be calculated on both the replacement of area and moment of inertia basis or based on Supplier proposed and Buyer approved method.

i. The entire vibrating structure including the insulation, supports and foundation shall have sufficient damping to absorb the cyclical energy input at critical wind velocities within amplitude resulting in acceptable stresses.

5.5 Platforms, Ladders and Stairways

a. Platforms, ladders, and stairways shall be provided as required including those specified herein. They shall be galvanized and conform to OSHA, local requirements and the Buyer's specifications.

b. All instruments, valves, and routinely accessed equipment on the FGD system shall be located to permit operator visibility, maintenance, inspection, repair and replacement.

c. Platform and ladder access shall be provided to instrumentation and controls, and valves not accessible from grade.

d. Access to operating platforms shall be by stair tower where practical. The stair tower shall be arranged so that all sections are entered from the immediate landing of the previous section.

e. The design of the FGD system will have walkways/access from the SDA stair tower directly to the lime and ash silo subject to final location of equipment.

f. Other platforms shall have ladder access. Platform and ladder access shall be provided to instrumentation and control valves. Permanent access shall be provided to exhaust gas thermocouple heads that cannot be accessed by temporary equipment located at grade. Permanent platform and ladder access shall be provided to test sampling ports.

g. Platforms shall be supported from the Supplier's equipment or Suppliers separate structure.

h. Platform, stair treads, and walkway flooring shall be galvanized serrated welded grating with 1-1/4 inch by 3/16 inch bearing bars at 1-3/16 inch centers and cross bars at 4 inch centers.

i. Stair treads shall be metal grating with perforated or checkered plate nosing. A non-slip nosing shall be provided on the grating at the head of stairs. Stairway slope shall not be steeper than 45 degrees with 9-3/4 inch treads and 7-3/4 inch risers.

j. The minimum platform clear widths shall be as necessary to provide accessibility but not less than 2'-6".

k. Valves and instruments requiring access to maintain the system for daily operations shall be located within easy reach of the platforms. Instruments shall be considered accessible by platform if they are within 18-inches of the handrail. Valve hand wheels shall be considered accessible if they are within six feet, six inches (6'–6") of platform floor or grade. Instruments and other items shall be considered accessible from grade or platform if they are within 7 feet from platform floor or grade.

l. At least two egress paths shall be provided on opposite corners of operating areas. The egress shall be clear and direct. The egress distance to a ladder or stairway shall not exceed 75 feet.

5.6 Multi-Louver Dampers and Actuators

a. The damper leakage shall not exceed 0.50% and shall provide shutoff of the duct internal area without open spaces. Supplier to provide rate for specified dampers if greater than 0.50%.

b. Damper, linkage, actuator, and sealing system details shall be submitted for Buyer authorization.

c. Blade position indicators shall be provided at the damper location and as required for Supplier control.

d. The damper shall be a multi-blade louver type. Damper blades shall be a minimum of 3/16 inch thick closing against 1/4 inch closure bars. Closure bars shall be serrated where required for expansion.

e. Damper bearings shall be external solid-lube flanged or permanently lubricated pillow block shaft support bearings.

5.7 Expansion Joints

a. The interface connection expansion joints (at the FGD system inlet duct) will be provided by Buyer. Supplier to provide transition duct combining ID fan flows up to and including expansion joint at the stack inlet flange. Supplier to provide expected maximum movement at these locations. The Buyer shall provide drilling pattern for connecting flanges.

b. CEG expansion joints shall be provided internal to the FGD system as necessary.

c. Expansion joint fabric shall conform to the applicable requirements of EJMA Standards.

d. The temperature of external expansion joint fabric, hardware, and flanges, including the flanges to which they connect, shall not exceed 140°F. Supplier to indicate if insulation is required on expansion joints.

e. Expansion joints shall permit repairs from the outside while the unit is in operation.

f. Expansion joints shall not have continuous flanges from liner to casing.

g. Liners and pillows shall be provided for maximum operating life of the expansion joint, if required for thermal barrier performance.

h. Expansion joints shall be complete with frames, hardware, flanges, gaskets, bolts, and nuts for both surfaces to which they attach.

5.8 Surface Preparation and Coatings

a. External structural steel shall be cleaned in accordance with SSPC SP-6 and galvanized in accordance with ASTM A123 and A 153. Field weld joints shall be masked. Field touch-up paint shall be provided for weld joints.

b. Ladders, cages, handrails, grating, toe plates and related hardware and all structural bolts, washers and nuts (for both shop and field joints and galvanized connections) shall be galvanized in accordance with ASTM A123 and A153.

c. Valves, instruments, panels, pumps and motors, control panels, junction boxes, electrical enclosures, instruments and controls, motors and rotary atomizers and miscellaneous mechanical equipment (i.e. blowers, fans, and hoists) shall be finish painted with the manufacturer's standard paint.

d. External piping, saddles, and clips for items to be insulated by the Buyer shall be cleaned per SSPC SP-6 and shop primed with one 3-5 mil minimum dry film thickness coat of inorganic zinc primer. Primer shall be masked at weld points.

e. Internal corrosion protective coatings on the baghouse clean air plenums and cleaning air manifold shall consist of epoxy painting including the SSPC surface preparation and minimum dry film thickness specified by the paint manufacturer or the FGD/Hg system Supplier. The paint shall be suitable for 440°F. Supplier to provide recommended protective coating manufacture for Buyer's approval. Field weld joints shall be masked. Field touch-up paint shall be provided. Zinc bearing paint, stalastic, or coal tar epoxy coatings are not acceptable.

5.9 Electrical Requirements

a. Supplier shall furnish all instruments and devices required for the operation of all equipment furnished by Supplier. Such equipment shall include solenoids, flow switches, internal heaters and freeze protection, timing devices, temperature detectors, and any other required electrical devices.

b. Electrical components shall be designed, built and tested in accordance with applicable NEMA and IEEE standards. All electrical equipment and devices furnished for separate mounting shall be checked and tested in the factory before shipment.

c. Whenever two or more pieces of electrical equipment are mounted in an enclosure or on a shipping section, they shall be factory wired to one common termination box mounted on the equipment for connection of Buyer's cables (except power and motor leads). Power and motor leads shall be terminated in separate equipment termination or motor termination boxes for incoming cables.

d. Connections between shipping sections shall be arranged to require a minimum of field wiring. Terminal blocks shall be provided on one side of a shipping break, and coiled wires, properly tagged, shall be provided on the other side to facilitate these connections.

e. All assemblies shall be furnished completely wired. With the exception of control and ac power buses, all other alarm and control wiring for extension to remote equipment or for interconnection between compartments shall terminate at terminal blocks.

f. All control panels and termination cabinets shall have NEMA 4X for outdoor, NEMA 12 for indoor, gasketed, hinged enclosures, complete with 3-point latch and handle and the required terminal blocks for external connections. All terminals and wires shall bear designations that correspond to the designations shown on Supplier's interconnecting diagrams. The interconnecting diagrams shall include the actual "as-built" arrangements of these terminal blocks. Electrical controls and other devices furnished by Supplier shall also be provided with NEMA 4X enclosures unless otherwise indicated.

g. Indicating devices shall be mounted on the front of the control panel. Relays, etc., shall be mounted inside the panel. All equipment shall be wired to conveniently located terminal blocks arranged for cables entering from above or below. Supplier to indicate the typical number of panels to be used for this operation.

h. All spare relay contacts shall be wired out to terminal blocks. Pushbuttons and selector switches shall be heavy-duty, NEMA type 4X, watertight/oiltight.

i. Each system circuit shall be properly protected with circuit breakers or pullout fuses. Circuit breakers furnished by Supplier shall have the following interrupting ratings:

- 4160 V ac, three-phase – 65,000 rms symmetrical amperes
- 480 V ac, three-phase - 65,000 rms symmetrical amperes
- 120 V ac, single-phase - 10,000 rms symmetrical amperes
- 125 V dc - 10,000 amperes

j. Nameplates shall be furnished for all control switches, relays, fuses, and other important devices. They shall be embossed stainless steel tags with a minimum 1/8 inch height of letters. Tags shall be secured with stainless steel wire having ends crimped together.

k. Nonmetallic components and devices such as terminal blocks, wireways, wire troughs, wire cleats, cable ties, etc., shall be manufactured from "nonburning" materials as defined by ASTM D635.

5.10 Control Devices

a. All control devices shall be designed for operation on 120 volts, single phase, 60Hz. If Supplier requires other than a 120V, 60 Hz power source, Supplier shall furnish a fused transformer suitably sized to handle the load, with a primary winding voltage of 120V.

b. Limit switches (with exception of fabric filter damper valves) shall be double pole, double throw, with a minimum of two (2) normally open and two (2) normally closed electrically independent contacts. The contacts shall have a minimum continuous rating of 10 amperes at 120 Vac.

c. All pressure switches and other electrical devices with electrical contacts shall have a minimum of two (2) normally open and two (2) normally closed electrically independent contacts. These contacts shall have a minimum 10-Ampere rating at 120 Vac.

d. All solenoids shall have 120-Vac encapsulated coils with Class H insulation rated for continuous duty. If solenoids are to be mounted within a control panel or locally mounted control enclosure, Supplier shall terminate leads on terminal blocks conveniently located for external wiring.

e. Non-reusable cartridge fuses & blown fuse indicators shall be provided for all control circuits. They shall be installed in easily accessible locations and identified by nameplates.

f. Failure of critical equipment to perform its proper function shall be indicated on the Facility PLC based control system furnished by Buyer. Supplier shall provide all required contacts for this purpose. Failure of any equipment to perform its proper function shall be signaled to the FGD PLC control system to allow for indication on the main coke plant control system HMI furnished by the Buyer. Supplier shall provide all required contacts for this purpose. Any components or control signals deemed critical by the Supplier shall be redundant.

5.11 Motor Operated Valves

a. The electric valve actuators for each of the valves shall be mounted directly to the valve, if possible. Actuators not accessible by mounting directly on the valve shall be floor mounted.

b. The actuator shall be provided with a manual hand wheel that does not rotate during motor operation and with a safety declutching feature should the motor drive become energized while the valve is under manual control.

c. The actuators shall be capable of operating the valve with full differential pressure across the main valve.

d. A calibrated mechanical valve position indicator shall be provided on the actuators providing continuous indication on valve position during travel.

e. The actuators shall be well supported by the valve (or by additional supports) so as not to exert any bending on the valve stem, producing unnecessary stress and wear of the stem and to allow good operation of the valve.

f. Grease lubricated power gearing shall be provided with "Zerk" grease fittings and reliefs.

g. The valve actuator shall be supplied with open and close torque and position limit switches for control.

h. Operation of the hand wheel shall not change the set points of the limit switches.

i. Valves shall be designed so that burned out bearings and/or motors shall not prevent hand operation of valves.

j. Integral valve positioners complete with feedback linkage shall be provided with all modulating control valves. A cam or similar means of adjustment shall be incorporated so that the relationship between the input signal and the valve position can be characterized. Positioners shall be easily reversible in the field and be complete with a bypass feature and input/output gauges.

k. Position Transmitter(where applicable): Position transmitters shall be provided with all modulating control valves receiving 4-20 mA dc signals for the control valve positioning. Position transmitter shall provide a 4-20 mA dc signal through 2-wire system. These signals will be wired to the control system to allow for indication in the main control room.

5.12 Motors (with the exception of specified rotary atomizer motors)

Electric motors shall be provided in accordance with Specifications GRC-60-5S-005, "Specification for Electric Motors 2300V and Higher" and GRC-80-5S-003, "Specification for Electric Motors 600V and Below".

5.13 General Wiring Requirements

This section does not apply to PLC cabinet design.

a. Terminal blocks shall be rated 600 volt, 20 amps. A permanent marking strip, identified in accordance with Supplier's wiring diagrams, shall be furnished on each terminal block. At least 20 percent (two per 12-point terminal block) spare terminal points shall be furnished.

b. All control wiring internal to panels shall be 600V, Type SIS, No. 14 AWG minimum, copper conductors with Class D stranding. Panel wiring shall be neatly routed in PVC wire duct and shall be filled no more than 40%. Wireways shall be sized in order to accommodate field wiring.

c. All power wiring internal to panels shall be 600V, No. 12 AWG minimum. Power cable #8 AWG and larger shall have copper conductors, with 194°F, heat, moisture, and flame-resistant ethylene-propylene-rubber (EPR) insulation with jacketing material in accordance with the NEC and UL listed as type TC.

d. The EPR insulation shall meet the physical and electrical requirements for Type I insulation as designated in ICEA S-68-516, Section 3.6.1 and 3.6.2. Power cable internal to panels

which is #10 AWG or #12 AWG shall be Type SIS with copper conductors and Class D stranding.

e. Shielded cable shall be used on all low-level signal wiring. Supplier shall use twisted-pair, No. 16 AWG, Class B stranded-copper wire with 300-V insulation over each conductor, aluminized mylar tape (with stranded-copper drain wire) over both conductors, and an overall jacket in accordance with the NEC and UL listed as type PLTC. If manufacturers of equipment furnished by Supplier specify the use of shielded or special conductors, Supplier shall furnish and install such conductors, subject to review by Buyer. Drain wires and shield tapes shall be fully insulated and terminated at terminal blocks on one end only.

f. All wiring internal to panels shall be capable of passing the flame test requirements of UL 44, section 56.

g. Wiring shall be terminated using feed-through compression-type terminals that firmly grip the conductor. Connectors shall be Thomas & Betts Sta-Kon or Buyer-approved equal. Both ends and at each terminating point of each wire shall be uniquely identified with permanent, heat shrinkable wire markers (257°F rated) (Raychem Thermofit) or other Buyer-approved permanent marker using indelible printing, white sleeve with black lettering. Adhesive wire labels are not acceptable.

h. A maximum of two conductors only shall be terminated at any one terminal point. No solder terminal connections shall be used. Splicing of wires is prohibited.

i. All 480V wiring shall be segregated from other control wiring and low voltage devices for personnel safety by means of an insulated barrier or other means.

j. Only one ground connection shall be provided for each instrument circuit. Ground connection for shield wiring shall be at the power source.

k. Wiring shall be neatly arranged and clamped securely to panels to prevent movement or breaking. Wiring clamps and supports at hinge transition points shall be properly sized to prevent chafing of insulation when the cubicle door is opened and closed. Metal clamps must have insulating inserts between the clamps and wiring. Nonmetallic clamps are preferred.

l. Cable Segregation: Medium voltage power cables, low voltage power and control cables, and low-level signal cables shall be installed in separate raceways.

m. Supplier's control system interrogation voltages for digital inputs or output voltages to solenoids shall be chosen to be compatible with the system segregation criteria listed above.

n. Wire Connector Requirements shall be constructed from high-conductivity copper and shall be tinplated.

o. Conductors shall have insulated ferrules whenever the spacing between adjacent terminations is such that they could make contact with one another. To ensure positive electrical connection and to avoid damage to the ferrule it is mandatory that proper crimping tools be used. Only those tools approved by the connector manufacturer shall be used. Crimping tools shall be calibrated. In the case of required special instruments that are only available with plug in type connectors, Supplier shall provide mating plug complete with connected cable. The cable end opposite the plug shall terminate on terminal blocks.

p. Coaxial and triaxial cable, if required, shall be furnished with a mating plug at each end, and shall be wired directly from the transmitting to the receiving instrument.

q. Thermocouple extension wires, where possible, shall be wired directly from the thermocouple to the terminal points on the instrument. If it is required to terminate thermocouple wires on terminal blocks, then blocks shall be of the correct material and

construction for the specific type of thermocouple wire supplied, or connections shall be made such that both incoming and outgoing conductors terminate under a common screw.

5.14 Piping and Valves

a. Supplier/Buyer interfaces shall be as specified herein and on the P&IDs. The Supplier shall show Buyer supplied terminal location on Supplier P&ID and piping drawings.

b. The Supplier shall incorporate all engineering, re-routing, supports, hangers, anchors and guides for the Supplier's piping including those required by analysis.

c. Drain collecting piping shall be provided to drain floors where condensation is continually expected. If continuous condensation is not expected individual drains shall have pipe caps or flanges with gaskets and blinds. All drains shall be accessible.

d. Structural supports, pipe supports, shims, slide plates, pipe guides, and anchors shall be provided for in the Supplier's piping. Pipe supports shall include standoffs to permit insulation around the circumference.

e. Clearance shall be provided for external insulation and personnel protection including standoffs on pipe supports and guides. Clearances shall be based on calcium silicate insulation thickness to achieve 140°F external surface temperatures at 80°F ambient temperature and 1 mph wind.

f. Modulating valves used frequently in operation and for startup and shutdown shall be dictated by the service. Packing for valves shall be Graphoil or Buyer authorized equivalent.

g. Valves exposed to CEG temperatures shall be suitable for the temperatures and CEG conditions.

h. Drains collecting piping shall have manual valves.

i. Isolation valves for auxiliary connections and instrument root valves shall be provided. The root valves shall be in addition to manifold and gauge block valves.

j. Pressure indicators shall be provided with gauge blocks and manifolds with bleed valves and close coupled isolation valve(s).

k. Cast steel valves for steam and water piping are acceptable for sizes 2-inch and over.

l. Knuckle clearance shall be a minimum of 3-inches in addition to insulation thickness for all valve handles. Maintenance clearance shall be provided for all valves, not less than 12-inches. Handles shall be oriented for operator convenience.

5.15 Instruments and Connections

a. Supplier shall provide instrumentation including, but not necessarily limited to, the following or as noted on Supplier supplied P&ID:

- Electronic transmitters
- Pressure switches
- Differential pressure switches
- Pressure gauges
- Differential pressure gauges
- Flow measuring orifices

- Flow measuring nozzles, venturi, and low loss tubes
- Analyzers
- Thermocouples, RTDs, and thermowells
- Temperature switches, if required
- Temperature gauges
- Solids ultrasonic level transmitters
- Solids level switches
- Liquid level transmitters
- Liquid level switches
- Level gauges
- Control valves
- Position transmitters (where applicable) are required on all modulating control valves

b. All components using instrument air shall fail in a "safe" position on loss of air. Supplier must indicate what the fail safe position is for all components

c. All instrumentation and systems shall be designed to provide safe and reliable operation of each unit in accordance with all applicable codes and standards.

d. All instrumentation shall be of heavy-duty industrial quality design with all materials of construction suitable for the application. The makes and models of instruments and instrument accessories to be used shall be subject to approval by Buyer and provided by the Supplier with their bid documents. All instrumentation and control devices supplied shall be NEMA 4X rated.

e. Provision shall be made for local reading of the measured variable sensed by instruments required to maintain daily local operations or to support maintenance activities. The provision shall use transmitters and a direct-connected separate instrument.

f. The following signal levels shall be used for instrumentation and control valve actuating; other signals must be approved by the Buyer:

• Analog	4 to 20 mA at 24 VDC
• Thermocouples	Type K
• Digital outputs	120 VAC
• Digital inputs	120 VAC
• Solenoids	120 VAC
• Pneumatic signals	3 to 15 psi

g. All instrumentation used for critical control shall be redundant. All other instrumentation shall not have redundancy.

h. Electronic process transmitters shall be smart-type, Fisher-Rosemount Indicating Transmitters (Model 3051) or approved equal. Pressure and differential transmitter shall have traditional flanges with mount the manifold type manifolds.

i. Dual element temperature probes shall be furnished as a minimum. All thermocouples shall be ISA Type K (Chromel Alumel) ungrounded tip. All resistance temperature detectors

(RTD) used for process monitoring shall be 100 ohm platinum, three wire type. (With the exception of specified rotary atomizers.)

j. Temperature, pressure, and level switches shall generally have double-pole, double-throw (two Form C) contacts for each actuation point and shall be equipped with screw-type terminal connections on a terminal block for terminating field wiring. The switch set point shall be adjustable with a calibrated scale to indicate the set point. Contacts shall be of the snap-acting type except for moving-float- and displacement-type level switches.

k. Thermometers for local mounting shall be of bimetal with 4-inch dials. The pointer of the thermometer shall be adjustable from the front of the thermometer dial. Dial scales shall have the normal operating range, which is in the middle third of the dial range. The dials shall be engraved with service legends, or the separate nameplates of engraved laminated phenolic shall be furnished attached to the dial faces to identify the service. Thermowells shall be of material compatible with the associated header and furnished for all thermometers.

l. Gauges for control air supply and signal pressures integral to an instrument shall be in accordance with the instrument manufacturer's standards.

m. All other gauges shall have a 4-inch dial with a pointer that is adjustable from the front of the gauge. Dial scales shall have the normal operating range, which is in the middle third of the dial range. Dials shall be engraved with service legends, or the separate nameplates of engraved laminated phenolic shall be attached to the gauge faces to identify the service. All gauges, except on control air service, shall have stainless steel movements and nylon bearings. Gauges for separate mountings shall have ½ inch, threaded-bottom connections. Each gauge, except control air gauges or those equipped with diaphragm seals, shall be furnished with a pulsation dampener made of the same material as the bourdon tube. Gauges for fluids that may be corrosive to the gauge internals shall be furnished with diaphragm seals.

n. Supplier shall define instrumentation protection requirements for each instrument, including designating instruments/instrument lines requiring heat tracing and/or instrument cabinets.

o. Supplier shall provide embossed stainless steel tags for all instrumentation:
   - All instruments shall be tagged with the appropriate instrument tag number in accordance with Specification No. GRC-00-1S-003, "Submittal Procedures Specification".
   - . Tags shall be secured with stainless steel wire with ends crimped together.

5.16 Instrument Tap Installation Criteria

a. Each instrument shall have its own process tap(s) off of the main process line. This requirement also applies to all level instrumentation.

b. Instrument pressure taps in horizontal process piping should generally be mounted on the top centerline where the process is air or gas. When the process is steam or a liquid, instrument pressure taps should generally be mounted on the side centerline of the process pipe. There shall not be any instrument taps on the bottom of process lines.

c. Instrument pressure taps shall be located such that there is undisturbed flow in the area of the tap. Thus, there should not be any device or component which could cause flow disturbance for a distance of at least 10 pipe diameters upstream and downstream distances should be no less than one foot.

d. Thermowells should generally be mounted on the top centerline of horizontal process piping. Thermowells should generally be located at least 5 pipe diameters or one foot (whichever is greater) downstream of any instrument pressure tap or flow tap. Thermowells may be located at least 10 pipe diameters or one foot (whichever is greater) upstream of any instrument pressure tap; however, this is not a preferred installation and should be avoided if possible.

e. Orifice flanges and flow nozzles or venturies shall be oriented such that taps are horizontal, neither above nor below the centerline of the pipe.

5.17 Instrument Installation

a. Instruments attached to Supplier's equipment shall not interfere with equipment access or removal areas nor be located in aisle ways. Supplier shall provide sufficient clearance area for site personnel to perform maintenance, calibration, or testing with instrument in place. Supplier's installation design shall not require removal of access housing or covers to disconnect and remove an instrument from service, nor should Supplier's design impede site personnel from easily viewing any instrument provided with local indication.

b. All instrument valves shall be installed and oriented so that a minimum clearance of 2-inches exists between the handle turning radius and any physical obstruction, including the turning radius of any adjacent valve handles.

c. All pressure instruments shall be provided with facilities for testing, calibration, and bleed-off in their installed positions. These facilities may be configured from fittings, union, valves, etc., or utilize valve manifolds. Instruments on Supplier's equipment may be mounted at the process taps provided the instruments are accessible and maintainable from the nearest permanent platform and are not subject to vibration or process pulsations.

5.18 FGD Control Hardware and Software Requirements

a. The Supplier Control System shall be a PLC-based system with all necessary control and operating functions for complete operation. The Supplier's system shall allow for integration of the PLC with the main coke plant's PLCs to permit control of the FGD system by the HMI's located in the coke plant's central control room. Communications between the Supplier PLCs and main coke plant PLCs shall be interconnected via Buyer supplied fiber optic network and have a common communication protocol, i.e. Modbus+. Specific criteria for the control system scope of supply are provided below.

b. PLC Based System – Hardware for Requirements for Control System

- One (1) main processor with specified redundancy and remote I/O drops as required.
- All PLC controllers shall be Quantum series manufactured by Modicon.
- All PLC's shall be provided with redundant processors, power supplies, and remote I/O communications with automatic changeover to the standby unit upon detection of a fault or failure of the operating unit. Automatic transfer between redundant processors shall be bumpless.
- PLC I/O cards shall not be redundant. PLC I/O associated with redundant equipment and instruments shall not be connected to the same I/O card. Where redundant equipment/devices are required, the I/O shall be segregated such that no control card or cable failure shall affect both devices.
- I/O modules shall be Modicon Quantum series configured as remote I/O using a dual (redundant) cable configuration. Digital I/O modules shall have individually isolated

signals, rated for 120 VAC service. Analog input modules shall be configurable for either current or voltage input signal. Analog output modules shall provide 4-20 mA output. Thermocouples input modules shall be configurable for any ISA thermocouple type.

- Control wiring panels should have at a minimum 20% spare I/O capacity.
- The PLC programming software shall be Concept by Modicon. The software shall permit online changes to the control system program with no interruption to operations. Actual Vendor and/or Buyer instrument/equipment numbers shall be used in the PLC programming in order to match Vendor and/or Buyer documentation. All PLC I/O tag descriptions shall be documented and software tags shall match Vendor and/or Buyer instrument/equipment tag numbers.The rotary atomizers shall use individual PLCs for control monitoring. PLC type to be from Modicon family capable of communicating with primary FGD control system.

c. Control Interface (HMI)

Operator interface screens shall allow for monitoring, control, alarming, and adjustment of the operation conditions via high-resolution Windows system graphics display. The screens shall be developed by the supplier, using the latest version GE Proficy's iFIX SCADA software, and integrated into the main coke plant control system to allow for operation from the coke plant central control room HMIs. Actual Vendor and/or Buyer instrument/equipment numbers shall be used on the HMI Displays in order to match Vendor and/or buyer documentation. All HMI tag descriptions shall be documented and software tags shall match Vendor and/or Buyer instrument/equipment tag numbers.

d. As a minimum, Supplier shall provide written system control descriptions and/or control logic diagrams (SAMA or binary logic format) for all system I/O, I/O lists, alarm lists, and all instrumentation required for control of the FGD and auxiliaries. This shall include the the system control description and/or control logic diagrams for the ID fans. Actual Buyer instrument/equipment numbers shall be incorporated into control logic drawings.

e. The FGD control design shall be such that failure of the control system does not affect the safe operation of the plant. The main objective of the control scheme is to provide safe, reliable and efficient start-up and shutdown with control and monitoring of all plant areas from the central control room. The instrumentation and control package shall allow automatic and local manual control including safety interlocks, emergency tripping, process control, alarm equipment and local instrumentation.

f. The latest proven version of the Supplier's system software shall be provided with the application (logic, screens, alarms, etc.) fully developed, debugged, tested, and installed.

g. Access to software and applications programs at various levels shall be restricted by the use of passwords.

h. Supplier will supply an automatic control interface with the Buyer's CEMs equipment such that the slurry injection rate will remain constant through the duration of the CEMs equipment calibration. Normal operation should resume once the calibration cycle is completed.

6 FABRICATION AND SHOP ASSEMBLY

6.1 Storage Vessels, Structure and Duct

a. Modular fabrication and delivery shall be utilized as much as possible within shipping and handling constraints.

b. Sections shipping in one piece shall be unitized weldments.

c. Bolted sections shall be trial fitted and match marked when practical. When not practical, matching members shall be simultaneously punched or punched from templates to maintain bolting pattern alignment.

d. Threads of bolts securing damper blades to shafts shall be scored or tack welded after installation.

e. Warped or distorted members or sections, including galvanized components, shall be pressed, straightened, or replaced prior to shipment.

6.2 Welding

All exhaust gas path boundary duct plate joints shall be continuous full penetration welds or continuous fillet welds per AWS D1.1.

6.3 Insulation

a. All material shall be handled and installed in accordance with the material manufacturer's recommendations, health and safety regulations and the minimum requirements specified herein.

b. Seams at corners, between panels and between dissimilar materials shall be sealed in accordance with details proven successfully in operation.

6.4 Shop Assembly

a. Shop assembly shall be maximized provided it suits the job-site transportation, off-loading, lay-down and storage area availability. Supplier to provide Buyer with a detailed description (i.e. piece-marked assembly drawings) of field erection requirements. Required internal equipment welds shall be clearly noted.

b. External piping larger than 2.0 inch NPS shall be shop fabricated into maximum size spools permitted by shipping limitations. Excess length in x, y and z direction shall be included for field fit-up and trim. Shop fabrication shall include connections 2-inch NPS and under such as thermowells, pressure, sample, vent and drain connections.

c. External piping 2.0 inch NPS and smaller shall be supplied by the Buyer.

d. Instruments shall be shipped loose to the job-site. Thermowells shall be shop installed in shop-fabricated piping.

e. Ladder, stairways, and platforms shall be shop assembled in sections to the maximum extent permitted by shipping and local limitations.

f. Clips and angles shall be shop installed on structural members with the exception of ladder platform clips, and pipe hangers.

g. All base plates shall be shop installed.

7 INSPECTION, EXAMINATION AND TESTING

7.1 Extended Surface

Extended surface shall be visually inspected to verify materials and dimensions.

7.2 Structure and Duct – General Fabrication Tolerances

a. Erection tolerances specified in the AISC Code of Standard Practice, Section 7, Erection, apply to the steel fabrication to the extent work affects the final erected outcome.

b. Plates of flat sections shall be within 1/2 inch of a straight line, and within 3/8 inch in any 3 foot span.

c. Framed beam length shall be within 1/16 inch for dimensions to 30 feet and 1/8 inch for dimensions over 30 feet.

d. The distance from structural support members to the nearest splice or base plate surface shall be within 1/8 inch.

e. Shop fabricated section overall dimensions shall be within +1/8 inch and -1/4 inch.

7.3 Witness, Inspection, Review and Hold Points

Inspection, review, witness and hold points for both the Buyer and Supplier shall be established during pre-inspection meetings. The Supplier shall promptly respond to notifications of damage or expected damage to components and of field installation problems. The Supplier shall physically inspect the components upon request to verify suitability for use, extent of damage and repair or replacement methods. These inspections shall be considered part of the work.

8 STORAGE, HANDLING, IDENTIFICATION AND SHIPPING

8.1 General Requirements

a. All precautions necessary for shipments to arrive at destinations without damage when handled by commercial handlers and carriers and that they are properly protected for storage at the job-site shall be taken.

b. The Supplier shall confirm shipping clearances and shall provide the status of shipments in transit upon request.

8.2 Storage and Handling

a. Buyer will receive, unload, store and install the equipment.

b. All equipment and components shall be packaged to withstand recommended method of shipment without damage. Each package shall be clearly labeled on the outside as to its contents.

c. Prepare all equipment for outdoor storage, except for bags, cages, rotary atomizer system and electrical equipment, unless otherwise authorized in writing by the Buyer.

d. All equipment, including insulated duct sections, shall be sealed to prevent entry of water, dirt or other foreign matter. Seals used on nozzles shall not affect threads, weld preparation or flange faces. Sheet metal caps extending over the entire weld preparation with a plywood disc inserted into the cap shall protect piping with ends prepared for field welding.

e. Thoroughly clean all exposed surfaces and paint exterior surfaces before shipping. Protect machined surfaces against corrosion prior to shipping.

f. Identify all equipment and components with equipment numbers specified and/or match marked to assist field assembly and erection. All items shipped shall be accompanied by instructions for storing and protecting.

g. Provide any fittings and material shipped loose with an identifying metal tag.

h. Include a complete packing list and Bill of Material with shipment of all materials.

i. Provide lifting lugs as necessary for unloading of equipment deliveries. Provide lifting load (weight) to the Buyer as part of the Receiving and Storing instructions.

8.3 Equipment Identification

a. The Seller shall incorporate equipment Tag numbers and identifications on drawings. As provides on submittal drawing reviews returns.

b. Identify equipment with stainless steel or engraved laminated phenolic tags permanently affixed to the device. All stainless steel tags shall be machine stamped on 1/16" thick, ¾" X 1 ½" minimum stainless plate. All laminated tags shall be machine engraved on 1/16" thick, ¾" X 1 ½" minimum, white finish plastic with a black core. Lettering for all tags shall be a minimum of ¼" high with all upper case letters. Electrical cables shall be tagged using heat-shrink, wrap-type markers. Pump nameplates shall include the following:

- Tag number
- Serial numbers,
- Date of manufacture,
- Manufacturer's name, model number
- Capacity and TDH
- Horsepower

c. All other equipment nameplates shall include, in addition to markings required by applicable code:

- Design temperature,
- Design pressure,
- Equipment service,
- Tag number

9 SUPPLIERS DRAWING AND DOCUMENTATION REQUIREMENTS

a. Submittals shall be made in accordance with Specification No. GRC-00-1S-003, "Submittal Procedures Specification".

b. The Supplier shall submit the following drawing sets as noted below. All drawings shall be dimensioned in English units.

- General Arrangement Drawings which identify all mechanical and electrical interface limits.
- Process Flow Diagrams (PFDs) and Piping and Instrumentation Diagrams (P&IDs).
- Control diagrams, logic schematics and narratives.
- Assembly and Erection drawings.

- Instrumentation location drawings. All instruments and control equipment located by Supplier shall be shown on one set of instrument location drawings. Buyer will not review different types of drawings to locate all instruments.
- Wiring and schematic diagrams showing complete internal and external point-to-point wiring, including all equipment that is factory wired as an integral part of the equipment.
- One-line electrical diagram with connective loads.
- Bills of Material for all equipment.
- Thermal insulation, lagging and lagging anchorage typical details and specifications.
- Routing arrangement and dimension drawings for large bore piping systems.
- Foundation, embedment requirements, and Foundation Load Diagram. Anchor bolt information shall include the size and location of bolts in relation to the unit's centerline, anchor bolt projection above concrete surface, bolt material strength, and required thread length. Leveling provisions shall be fully described.
- Structural design criteria and load diagrams. The load diagrams shall indicate all vertical, lateral and dynamic loads transmitted to the foundation at each support location. Load diagram drawings shall be sealed by a Professional Engineer registered in the State of Illinois.

c. Lists

The following lists shall be provided.

- Piping and valve lists
- I&C input/output list
- Alarm list
- Instrument list (including instrument names, models, and calibration data)
- Motor List

d. Procedures

The following procedures shall be provided by the Supplier.

- Shop cleaning, checking and testing procedures,
- Surface preparation and painting
- Welding Procedures
- Unloading Procedures
- Installation turn over Procedures
- Start-up and Commissioning Procedure

e. Supplier shall furnish detailed specifications, calibration, and set point data for all instruments and control devices (including safety-relief valves) furnished by Supplier for field installation or which require calibration and set point adjustments.

f. The Supplier will supply the following for their complete scope of supply:

- Installation guides, including any special tolerances, clearances or instructions.
- Construction test(s) instructions, including data sheets.

- Construction completion certification documents.
- Commissioning instructions, including commissioning testing and documentation. Support requirements for commissioning; people, skill sets, equipment, etc.
- Start-up instructions, test requirements, and documentation. Support requirements for start-up; people, skill sets, equipment, etc..
- Final completion and customer acceptance documentation.

NOTE: Assume that all of the work performed above will be by others and that the Supplier will provide a construction advisor, commissioning assistance, and Supplier services during construction and commissioning to advise, witness and or approve the results.

g. Supplier will provide guidance on equipment lay-down and pull space area requirement with component weights and overall dimensions that will be required for erection of the FGD system.

h. Motor nameplate data for all motors furnished in the form of nameplate drawing or a completed proposal data form certified to be actual nameplate data.

i. Supplier will provide a utility requirement table listing required utility connections, sizes, and average and peak loads.

j. Operation and Maintenance Manuals

Supplier shall furnish Buyer with eight (8) bound sets of complete instruction, operating and maintenance manuals for all equipment furnished by Supplier, consisting of manufacturers' instruction books, leaflets and drawings for maintenance, operation, and erection of the equipment to give Buyer complete information for operation, maintenance, ordering of spare parts and dismantling of equipment. The information shall be separated into logical groups or sections with identifying tabs. Each instruction/operating book shall have an index listing all leaflets in the same order as they appear in the book. (Individual submittal of various manufacturers' instruction books, etc., will not be acceptable.) These manuals shall also be provided in an electronic format compatible with standard software from Microsoft, Autodesk Autocad or Adobe Acrobat.

- Two (2) preliminary copies of the final instruction/operating books for all equipment furnished by Supplier shall be submitted to Buyer for comments four (4) weeks before final issue of the books.
- The final submittal of all O&M manuals shall be issued after erection of the FGD system and shall include:
- Equipment identification by equipment number, area number, Unit number, and function name.
- Final reduced as-built drawings of general arrangements and cross sections, guaranteed performance data, design data, test results, and performance curves for all equipment.
- Complete operation, troubleshooting, and maintenance instructions.
- Parts list shall be complete in every respect. Parts shall be identified by the original manufacturers' complete part number as well as by Supplier's identification number.
- Recommended lubricants and frequency of lubrication.
- List of special maintenance tools furnished.
- Electronic pdf copy of description, operating, troubleshooting, and other functional aspect of the O&M manual which will be integrated by the Buyer into an overall system O&M manual.

- O&M manuals shall be thoroughly edited before submittal, to exclude and/or to cross out text, data, illustrations, curves, etc., that do not apply to the specific equipment purchased.
- Supplier shall supply additional information or replace information or entire O&M manuals if field inspection of equipment indicates omissions or inaccuracy of the books.
- The furnishing of the above O&M manuals, which include engineering data, drawings, etc., is not related to the responsibility of Supplier to submit drawings and data as listed in SUPPLIERS DRAWINGS AND DATA. The O&M manuals are to be submitted in addition to, and separate from, the submittal of drawings and data listed under this section.

10 PERFORMANCE AND OPERATING REQUIREMENTS

Equipment shall be designed and installed to maximize flexibility of operation and enable operation with the entire range of gas conditions specified herein. It shall be the Seller's responsibility to ensure that the equipment can achieve the entire range of operating and guaranteed parameters defined by this specification.

10.1 Operating Conditions

The Seller shall use the following Operating Conditions in the design of the Equipment:

- FGD Design Summary Conditions as stated in Attachment A, Table 2.
- Site Conditions as stated in Specification No. GRC-00-1S-002

10.2 Guarantee Points

The Seller shall provide the Buyer with guarantees at the specified Site Conditions and FGD Design Summary (Table 2) conditions under the average design case specified (24.5% VM Normal Operating case) in Attachment A.

- Supplier to guarantee 30-day rolling average of emission values per table in paragraph 10.4 with all atomizers running.
- Supplier to demonstrate ability to meet the guarantee emissions values by maintaining 4-hour rolling average of emissions per the table in paragraph 10.4 during the 48-hour plant performance test. Supplier shall provide performance predictions curves to correct for site specific performance test conditions.
- Supplier to guarantee FGD System pressure drop from the FGD inlet duct terminal point to the common outlet duct terminal point for both the normal operating condition, as well as the maximum flow condition, described in Attachment A.
- Guarantee pressure of -13 inches WC at maximum flow case at the duct inlet terminal point.
- EPA Method 17 for particulate emissions testing. EPA Method 8 or certified CEMs for SO_2 emissions testing.

10.3 Environmental Requirements

In addition to the environmental stipulations contained herein, the Seller shall ensure that all environmental restrictions in effect at the time of the contract within the guidelines stipulated by the US Environmental Protection Agency and by the local authority, where applicable, are adhered to when designing, installing and commissioning the plant.

10.4 Gaseous and Particulate Emissions

The following table represents the emissions data from the environmental permit application that the Equipment Contractor must guarantee that the Equipment shall not exceed.

Name of Air Contaminant		Emissions Concentrations	Emission Rate in lb/hr from FGD
Particulates	PM	0.005 gr/dscf	
Sulfur Dioxide	SO_2		227 [A]

[A] Based on a 30 day rolling average

The exhaust stack of the FGD shall be continuously monitored for SO_2 and opacity. The monitoring equipment (by Buyer) shall meet the requirements of CFR40, Part 60. The following information shall be displayed:

- SO_2 in ppmvd at actual stack conditions
- SO_2 in lb/hr
- Opacity in percent of light transmitted

The measured values shall be recorded at least once every 15 minutes and displayed in the Control Room. The stack shall also be fitted with an oxygen monitor and results from this shall be used to correct the SO_2 measured value to the format required by US EPA. Sampling points and safe access adjacent to the monitoring points shall be installed.

10.5 Aqueous Emissions

The Supplier shall notify Buyer of any effluent discharge requirements (if any) for the Equipment.

10.6 Noise

The 1 meter average surface sound pressure level as defined in ISO 3744:1981 shall not exceed 85 dBA for any item of individual equipment. The measured noise level on the Site at 1 meter from normally accessible machinery surfaces when measured at a height of 1 meter above ground level, from all equipment sources together and including the effect of reflections shall not exceed 90 dBA. This requirement does not apply to the SDA Penthouse which will be designated as a hearing protection area.

The noise level as defined in ISO 3744:1981 shall not exceed Noise Rating 50 in the Control Room or the Workstation. Due account shall also be made for noise containment with regard to auxiliary equipment and locations.

ATTACHMENT A

TABLE 1 – DESIGN COAL CHEMISTRY

Compound	Description
Chlorine	0.15% by weight, dry basis (max)
Sulfur (1)	1.1% by weight, dry basis (max)
Mercury	0.20 ppm by weight, dry basis (max)
Moisture	8%

(1) 52% reports to the flue gas to produce SO_2
48% remains within the coke

TABLE 2 - FGD DESIGN SUMMARY

GECC - FGD Design Basis	Normal Case 0 24.5% VM MINIMUM	Normal Case 1 24.5% VM AVERAGE	Normal Case 2 24.5% VM MAXIMUM	Design Case 3 27.0% VM AVERAGE	Design Case 4 27.0% VM MAXIMUM
Coke Plant Basis					
Number of Coke Ovens	120	120	120	120	120
Number of HRSGs	6	6	6	6	6
Overall Peak / Mean	1.22	1.22	1.22	1.22	1.22
Coal & Coke Basis					
Coal VM - %	24.50%	24.50%	24.50%	27.00%	27.00%
Coal Moisture - %	8.00%	8.00%	8.00%	8.00%	8.00%
Wet Coal Charge - tons	50	50	50	50	50
Dry Coal Charge - tons	46	46	46	46	46
Coke Yield - % dry	72.50%	72.50%	72.50%	70.00%	70.00%
Sulfur & Chlorine Basis					
Sulfur in Coal Blend - % dry	1.10%	1.10%	1.10%	1.10%	1.10%
Sulfur % → Flue Gas	52.00%	52.00%	52.00%	52.00%	52.00%
Sulfur % → Coke	48.00%	48.00%	48.00%	48.00%	48.00%
Chlorine in Coal Blend - % dry	0.15%	0.15%	0.15%	0.15%	0.15%
Chlorine % → Flue Gas	100.00%	100.00%	100.00%	100.00%	100.00%
Chlorine % → Coke	0.00%	0.00%	0.00%	0.00%	0.00%
Flue Gas Basis					
SDA Inlet Temperature - °F (2)	375	375	400	500	500
Flue Gas Moisture - %	13.47%	13.47%	15.23%	12.48%	14.13%
Flue Gas O_2 - % dry	8.00%	8.00%	6.00%	8.00%	6.00%
Molecular Weight - kg/kmol	28.14	28.14	28.14	28.14	28.24
Mass Flow Rate - lbs/hr	1,009,930	1,294,782	1,392,624	1,405,360	1,510,717
SCFM	233,768	299,703	322,350	325,298	348,447
DSCFM	202,280	259,333	273,256	284,701	299,211
ACFM	375,378	481,254	517,620	600,551	643,287
SO_3 Inlet Rate - lbs/hr	2052	2631	3210	2631	3210

SO_2 Inlet Concentration - ppm	-	-	-	-	-	
HCl Inlet Rate - lbs/hr (1)	355	355	355	355	355	
HCl Inlet Concentration - ppm	-	-	-	-	-	
FGD System Basis						
SO_2 Outlet Limit - lbs/hr	227	227	227	227	227	
Removal Efficiency - %	88.94%	91.37%	92.93%	91.37%	92.93%	
Outlet Conditions						
Temperature - °F	Supplier +3% air leakage	Supplier +3% air leakage	Supplier +3% air leakage	Supplier +3% air leakage	Supplier +3% air leakage	
Flow - lbs/hr						
SO2 Rate - lbs/hr (3)	(4)	(4)	(4)	(4)	(4)	
HCl Concentration - ppm	Supplier	Supplier	Supplier	Supplier	Supplier	
Hg Concentration - ppm						
Water vapor Mole %	Supplier	Supplier	Supplier	Supplier	Supplier	
Pressure - Inch WC	Supplier	Supplier	Supplier	Supplier	Supplier	

1. Note that GECC basis does not allow peak-to-mean following for HCl loading

2. Supplier to provide calculated condensation temperature based on flue gas. The SDA shall operate at a temperature range as specified in paragraph 3.1f.. This information shall be provided with the Suppliers bid proposal.

3. SO_2 to SO_3 conversion at SDA inlet is 3%

4. See Section 10 as the basis for Outlet SO_2 limits

Note: All cases at specified Design Coal chemistry.

TABLE 3 – BOILER ASH ANALYSIS

From Indiana Harbor Coke Company

	Radiant Section	Evaporative Section	Economizer Section
Mineral Analysis	Ignited Basis	Ignited Basis	Ignited Basis
	% Weight	% Weight	% Weight
Silica, SiO_2	30.40	30.82	26.10
Alumina, Al_2O_3	15.98	34.80	12.28
Titania, TiO_2	0.91	1.04	0.84
Iron oxide, Fe_2O_3	8.80	4.16	15.66
Calcium oxide, CaO	2.16	2.61	1.42
Magnesium oxide, MgO	0.45	0.21	0.38
Potassium oxide, K_2O	4.20	2.70	4.80

Sodium oxide, Na_2O	8.80	4.90	11.24
Sulfur trioxide, SO_3	20.40	13.05	18.15
Phosphorus pentoxide, P_2O_5	6.00	5.20	7.50
Strontium oxide, SrO	0.05	0.04	0.05
Barium oxide, BaO	0.08	0.03	0.08
Manganese oxide, Mn_3O_4	0.07	0.04	0.14
Undetermined	1.70	0.40	1.36
Ash Fusion Temperatures			
Reducing	**°F**	**°F**	**°F**
Initial Deformation	2135	1980	1755
Softening	2220	2040	1855
Hemispherical	2285	2090	1955
Fluid	2330	2140	2050
Oxidizing	**°F**	**°F**	**°F**
Initial Deformation	2200	2120	1915
Softening	2285	2185	2085
Hemispherical	2375	2240	2170
Fluid	2460	2300	2250

From Haverhill North Coke Company

Mineral Ash Analysis	#4 Boiler Ignited Basis % Weight
Silica, SiO_2	38.54
Alumina, Al_2O_3	10.77
Titania, TiO_2	1.21
Iron oxide, Fe_2O_3	10.65
Calcium oxide, CaO	0.86
Magnesium oxide, MgO	0.42
Potassium oxide, K_2O	11.15
Sodium oxide, Na_2O	7.34
Sulfur trioxide, SO_3	12.7
Phosphorus pentoxide, P_2O_5	5.09
Strontium oxide, SrO	0.07
Barium oxide, BaO	0.09
Manganese oxide, Mn_3O_4	0.03
Undetermined	1.08
Ash Fusion Temperatures	
Reducing	°F
Initial Deformation	2198
Softening	2236
Hemispherical	2307
Fluid	2389
Oxidizing	°F
Initial Deformation	2232
Softening	2276
Hemispherical	2322
Fluid	2402

TABLE 4 – TYPICAL BAGHOUSE DUST ANALYSIS

	Six Days of Data					
Mineral Analysis	Dry Basis	Dry Basis	Dry Basis	Dry Basis	Dry Basis	Dry Basis
After Firing at 1000°C	% Weight	% Weight	% Weight	% Weight	% Weight	% Weight
Silica, SiO_2	0.31	0.29	0.31	0.30	0.46	0.49
Alumina, Al_2O_3	0.08	0.08	0.06	0.10	0.10	0.10
Titania, TiO_2	0.01	0.01	0.01	0.01	0.01	0.01
Iron oxide, Fe_2O_3	0.16	0.15	0.16	0.25	0.23	0.24
Calcium oxide, CaO	43.49	43.79	44.65	44.63	45.42	45.55
Magnesium oxide, MgO	0.48	0.48	0.30	0.48	0.60	0.43
Potassium oxide, K_2O	0.05	0.05	0.05	0.06	0.05	0.05
Sodium oxide, Na_2O	0.06	0.06	0.06	0.10	0.06	0.08
Sulfur trioxide, SO_3	46.62	46.12	46.02	42.42	40.62	44.42
Phosphorus pentoxide, P_2O_5	0.04	0.05	0.05	0.04	0.04	0.04
Strontium oxide, SrO	0.01	0.01	0.01	0.01	0.01	0.01
Barium oxide, BaO	0.02	0.02	0.02	0.02	0.03	0.02
Manganese oxide, Mn_3O_4	0.01	0.01	0.01	0.01	0.01	0.01
Undetermined	8.66	8.90	8.31	11.5	12.3	8.55
Loss at Ignition at 1000°C	7.19	7.88	7.84	10.25	9.92	6.73
	Dry Basis	Dry Basis	Dry Basis	Dry Basis	Dry Basis	Dry Basis
Calcium sulfate, $CaSO_4$	13.00	11.77	14.75	10.16	11.05	10.12
Calcium sulfite, $CaSO_3$	58.46	58.76	55.99	54.67	50.88	57.71
Calcium Hydroxide, $Ca(OH)_2$	11.30	10.52	11.68	26.88	10.94	10.24
Calcium carbonate, $CaCO_3$	0.86	0.96	0.98	0.92	0.88	0.98

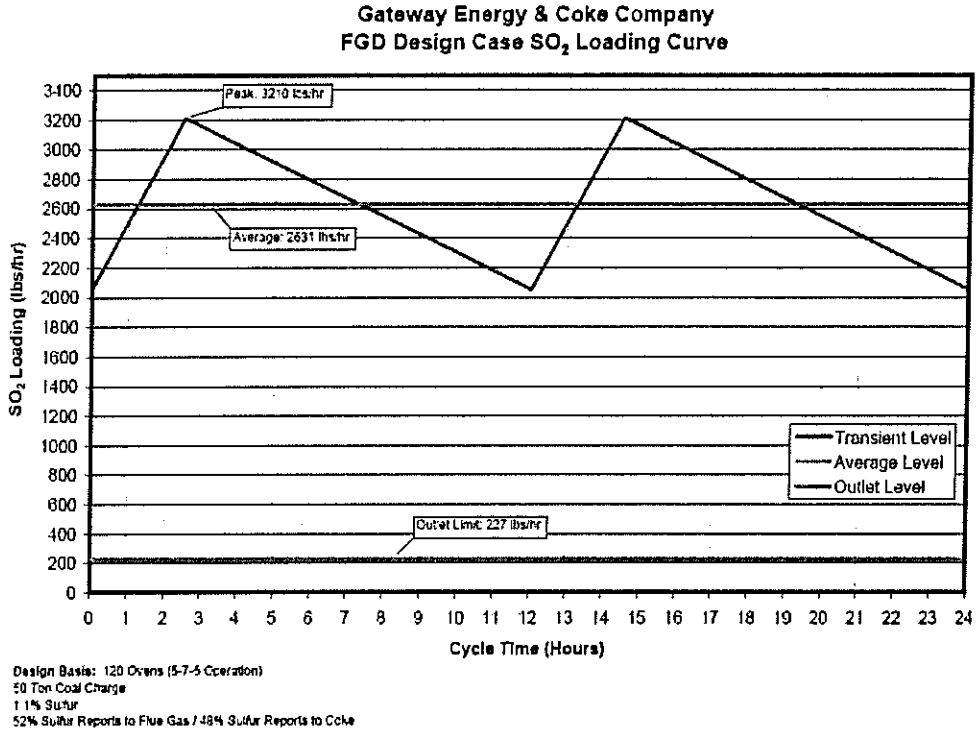
ATTACHMENT B

FLUE GAS COMPOSITION

24.5%VM			
	Case 1 - Average	**Case 2 - Maximum**	**Minimum**
Flow Rate (lbs/hr)	1,294,782	1,392,624	-
Flue Gas Temperature	-	-	-
H_2O	13.47 mole %	15.23 mole %	-
CO_2	8.26 mole % dry	9.53 mole % dry	-
SO_2	0.10 mole % dry	0.12 mole % dry	-
N_2	83.64 mole % dry	84.35 mole % dry	-
O_2	8.00 mole % dry	6.00 mole % dry	-

ATTACHMENT C

SO_2 Loading Curve



GECC - Granite City, Illinois 10/2/2006

ATTACHMENT D
SLAKING WATER QUALITY

Characteristic	Slaking Water	Dilution Water Maximum, PPM
Calcium		232
Copper		-
Iron		4
Magnesium		116
Sodium		-
Chlorides	<100	-
Sulfate, Sulfite and Bi-Sulfite	<500 (Total)	-
Fluoride		-
Total Silica	<20	-
Bicarbonate		-
Total Harness, as CaCO3	<250	348 as ion, 870
Total Organic Carbon		-
pH	7-8	(7.5 to 8.3) 7.82
TSS – Total Suspended Solids	<50	(205) 79
TDS – Total Suspended Solids	<400	(1050) 1000

Note:

Values in Parenthesis, (x) are the maximum measurements, but not necessarily the same grab sample.

ATTACHMENT E
Submittal Requirements

Document	Weeks after Purchase Order for non-recurring documentation
General Arrangements	2
P&IDs	2
Mechanical and Electrical Interfaces	4
Control Diagrams, logic and narratives	6
Instrument Locations	6
One line Electrical	4
Bill of Material (trim list)	4
Thermal Insulation typical specifications	6
Foundation Load Diagram (except ID Fans) (Preliminary)	2
Foundation Load Diagram (ID Fans) (Preliminary)	2
Final Load Diagram	4
Piping and Valve List	4
I/O List	4 s
Alarm List	4
Instrument List	4
Motor List	4
Shop Cleaning and Inspection Procedures	8
Surface Preparation and Painting Procedures	8
Welding Procedures (preliminary)	As generated
Erection Procedures (final)	8
Start Up and Commissioning Procedures	8
Off Loading Procedures	8
Detailed Instrument Data	W/Instrument List
Motor Nameplate Data	W/Motor List
Field Erection Manual (preliminary)	As generated
Field Erection Manual (final)	8
Equipment Lay Down Requirements	8
O&M Manuals (preliminary)	TBD
O&M Manuals (final)	TBD
As Built Drawings	4 weeks after Constructor Mark ups
Final Control Settings	4 weeks after Performance Test

Sunoco, Inc.
1735 Market Street Ste LL
Philadelphia PA 19103-7583
Richard F. Booker
(215) 977-6010

VIA FEDEX
October 18, 2010

Alan Keller, P.E.
Manager, Permits Section
Illinois Environmental Protection Agency
/ Bureau of Water
1021 N Grand Ave E
Springfield, IL 62702

Ed Bakowski
Illinois Environmental Protection
Agency / Dept. of Air Pollution Cont.
1021 N Grand Ave E
Springfield, IL 62702

Re: SunCoke Energy, Inc. – Gateway Energy & Coke Company, LLC, Application for Certification of Pollution Control Facilities - State Route 203, Granite City Illinois

Dear Messrs. Keller and Bakowski:

On behalf of SunCoke Energy, Inc. and its subsidiary, Gateway Energy & Coke Company, LLC (both of which are wholly owned subsidiaries of Sunoco, Inc.), we do hereby respectfully submit two (2) amended Applications for Certification (Property Tax Treatment) Pollution Control Facility (Air), located at State Route 203, Madison County, Illinois, on Parcel No. 22-2-20-1-00-000-004.002. The prior applications for the same pollution control facilities were filed on December 28, 2009, and reflected incorrect information in Section E (5)(a) (the Fair Cash Value if Considered Real Property).

Specifically, the original Application for Certification of Pollution Control Facility on parcel no. 22-2-20-1-00-000-004.002 (Water) incorrectly identified the Fair Cash Value if Considered Real Property at $250,000,000. This figure was reported based on the mistaken belief that only 50% of the costs should have been reported. The actual Fair Cash Value if Considered Real Property of this Pollution Control Facility is $250,000,000, and this is the amount reported in Section E(5)(a) of the amended Application enclosed. All other information on the amended Application is the same as reported on the original application.

Similarly, the original Application for Certification of Pollution Control Facility on parcel no. 22-2-20-1-00-000-004.002 (Air) incorrectly identified the Fair Cash Value if Considered Real Property at $500,000. This figure was reported based on the mistaken belief that only 50% of the costs should have been reported. The actual Fair Cash Value if Considered Real Property of this Pollution Control Facility is

Exhibit B

$1,000,000, and this is the amount reported in Section E(5)(a) of the amended Application enclosed. All other information on the amended Application is the same as reported on the original application.

For your records and use, we have enclosed an original of each Amended Application. We have also enclosed a copy of each Amended Application, which we request that you file-stamp and return in the self-addressed envelope enclosed.

If you have any questions or comments, please contact me at (215) 977-6001.

Very truly yours,

Richard F. Booker,
Senior Tax Counsel and
Manager, State and Local Taxes
Sunoco, Inc. (R&M)

RFB:
Enclosures

cc: M. Prendergast (USS; via Fax w/o enc.)

APPLICATION FOR CERTIFICATION (PROPERTY TAX TREATMENT)
POLLUTION CONTROL FACILITY
AIR ☒ WATER ☐

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
P. O. Box 19276, Springfield, IL 62794-9276

This Agency is authorized to request this information under Illinois Revised Statues, 1979, Chapter, 120, Section 502a-5. Disclosure of this information is voluntary. However, failure to comply could prevent your application from being processed or could result in denial of your application for certification.

FOR AGENCY USE

File No.	Date Received	Certification No.	Date

Sec. A — APPLICANT

Company Name SunCoke Energy	
Person Authorized to Receive Certification Richard F. Booker, Esq.	Person to Contact for Additional Details John Mendillo
Street Address 1735 Market Street, 15th Floor	Street Address 11400 PARKSIDE DRIVE
Municipality, State & Zip Code Philadelphia, PA 19103	Municipality, State & Zip Code KNOXVILLE, TN 37934
Telephone Number (215) 977-6010	Telephone Number (865) 288-5257
Location of Facility Quarter Section: 19 — Township: 3N — Range: 9W	Municipality: Granite City, IL — Township: 3N
Street Address State Route 203	County: Madison — Book Number: 5
Property Identification Number 22-2-20-1-00-000-004.002	Parcel Number 22-2-20-1-00-000-004.002

Sec. B — MANUFACTURING OPERATIONS

Nature of Operations Conducted at the Above Location

Production of metalurgical coke, used in steel production (heat recovery coke plant).

Water Pollution Control Construction Permit No. 2009IA1747	Date Issued 01/09/09	
NPDES PERMIT No. ILR006808	Date Issued 08/27/09	Expiration Date 04/30/14
Air Pollution Control Construction Permit No. 06070020	Date Issued 03/13/08	
Air Pollution Control Operating Permit No. N/A	Date Issued	

Sec. C — MANUFACTURING PROCESS

Describe Unit Process

SunCoke Energy furnishes metallurgical coke to integrated steel makers utilizing blast furnace technology. Ovens operate on a regenerative principle that separates coal into carbon in solid state and transforms volatile matter into gases. These toxic gases are then thermally destroyed.

Materials Used in Process

A horizontal bed of coal approximately 1m deep, 4m wide and 14m long is charged into the side of a hot oven using a leveling conveyor. SunCoke Energy uses large batch coal charges and 48-hour coking cycles.

Sec. D — POLLUTION CONTROL FACILITY DESCRIPTION

Describe Pollution Abatement Control Facility

See attached description of pollution control facilities

Sec. E — POLLUTION CONTROL FACILITY – CONTAMINANTS / ACCOUNTING DATA

(1) Nature of Contaminants or Pollutants

Contaminant or Pollutant	Material Retained, Captured or Recovered: DESCRIPTION	DISPOSAL OR USE
Particulate Matter/Sulfur Dioxide	Spray dryer/Baghouse	Fly ash sent to municipal landfill
Particulate Matter	PCM Baghouse	Dust recycle back to coal stock
Particulate Matter	Hot Car Multiclone	Reclaim dust to coke breeze
Particulate Matter	Coke Screen Baghouse	Reclaim dust to coke breeze ($7/ton)
Particulate Matter (see also air permit attch'd.)	Wet Supression	N/A (dust control)

(2) Point(s) of Waste Water Discharge

	Plans and Specifications Attached	Yes ☒	No ☐
(3)	Are contaminants (or residues) collected by the control facility?	Yes ☒	No ☐
(4)	Date installation completed 10/09/09 status of installation on date of application		
(5) a.	FAIR CASH VALUE IF CONSIDERED REAL PROPERTY:	$ 124,544,186.00	
b.	NET SALVAGE VALUE IF CONSIDERED REAL PROPERTY:	$ 1,000,000.00	
c.	PRODUCTIVE GROSS ANNUAL INCOME OF CONTROL FACILITY:	$ 321,930.00	
d.	PRODUCTIVE NET ANNUAL INCOME OF CONTROL FACILITY:	$ 0.00	
e.	PERCENTAGE CONTROL FACILITY BEARS TO WHOLE FACILITY VALUE:	% 40.6	

Sec. F — SIGNATURE

The following information is submitted in accordance with the Illinois Property Tax Code, as amended, and to the best of my knowledge, is true and correct. The facilities claimed herein are "pollution control facilities" as defined in Section 11-10 of the Illinois Property Tax Code.

Signature — Mgr. State and Local Taxes (Title)

Sec. G — INSTRUCTIONS

INSTRUCTIONS FOR COMPILING AND FILING APPLICATION

General: Separate applications must be completed for each control facility claimed. Do not mix types (water and air). Where both air and water operations are related, file two applications. If attachments are needed, record them consecutively on an index sheet.

Sec. A	Information refers to applicant as listed in the tax records and the person to be contacted for further details or for inspection of facilities. Define facility location by street address or legal description. A plat map location is required for facilities located outside of municipal boundaries. The property identification number is required.
Sec. B	Self-explanatory. Submit copies of all permits issued by local pollution control agencies. (e.g. MSD Construction Permit)
Sec. C	Refers to manufacturing processes or materials on which pollution control facility is used.
Sec. D	Narrative description of the pollution control facility, indicating that its primary purpose is to eliminate, prevent or reduce pollution. State the type of control facility. State permit number, date, and agency issuing permit. A narrative description and a process flow diagram describing the pollution control facility. Include a listing of each major piece of equipment included in the claimed fair cash value for real property. Include an average analysis of the influent and effluent of the control facility stating the collection efficiency.
Sec. E	List air contaminants, or water pollution substances released as effluents to the manufacturing processes. List also the final disposal of any contaminants removed from the manufacturing processes. Item (1) – Refers to pollutants and contaminants removed from the process by the pollution control facility. Item (2) – Refers to water pollution but can apply to water-carried wastes from air pollution control facilities. Submit drawings, which clearly show (a) Point(s) of discharge to receiving stream, and (b) Sewers and process piping to and from the control facility. Item (3) – If the collected contaminants are disposed of other than as wastes, state the disposition of the materials, and the value in dollars reclaimed by sale or reuse of the collected substances. State the cost of reclamation and related expense. Item (4) – State the date which the pollution control facility was first placed in service and operated. If not, explain. Item (5) – This information is essential to the certification and assessment actions. This accounting data must be completed to activate project review prior to certification by this Agency.
Sec. F	Self-explanatory. Signature must be a corporate authorized signature.

Submit to:	Attention:	Attention:
Illinois EPA P.O. Box 19276 Springfield, IL 62794-9276	Al Keller Permit Section Division of Water Pollution Control	Donald E. Sutton Permit Section Division of Air Pollution Control

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

1021 NORTH GRAND AVENUE EAST, P.O. BOX 19276, SPRINGFIELD, ILLINOIS 62794-9276 • (217)782-2829

PAT QUINN, GOVERNOR LISA BONNETT, DIRECTOR

Memorandum
Technical Recommendation for Tax Certification Approval

Date: December 6, 2013

To: Robb Layman, Assistant Counsel

From: Jim Ross, Division Manager

Subject: SunCoke Energy, Inc., **TC-12-28-09**

The Illinois EPA received a request on December 28, 2009, from SunCoke Energy, Inc., for an Illinois EPA recommendation regarding tax certification of air pollution control facilities pursuant to 35 Ill. Adm. Code 125.204. A revised application containing additional supporting materials was received from the company on October 18, 2010. In consultation with my staff, I approve the following recommendation:

The air pollution control facilities in this request include the following:

> Lime Spray Dryer Absorber, Fabric Filter systems, Afterburner Tunnel System and other control measures, which remove particulate matter and fugitive emissions, sulfur dioxide emissions and volatile organic material emissions from manufacturing activities relating to the new Heat Recovery Coke Plant. Because the primary purpose of this system is to reduce or prevent air pollution, it can be certified as a pollution control facility.

This facility is located at State Route 203, Edwardsville Road, in Granite City, Illinois.
The property/parcel identification number is 22-2-20-1-00-000-004.002.

Based on the information included in this submittal, it is the Division of Air Pollution Control's engineering judgment that the proposed facility may be considered "Pollution Control Facilities" under 35 IAC 125.200(a), with the primary purpose of eliminating, preventing, or reducing air pollution, or as otherwise provided in this section, and is therefore eligible for tax certification from the Illinois Pollution Control Board. Therefore, it is the Illinois EPA's recommendation that the Board issue the requested tax certification for this facility.

Exhibit C