

PROJECT SUMMARY

I. Introduction

The Chicago Coke Company has submitted a construction permit application for a "pad-up rebuild" prior to resuming operations of its plant in the City of Chicago. The plant produces metallurgical coke primarily for use in blast furnaces in the iron and steel industry. The pad-up rebuild would involve replacing the brickwork of the coke oven battery, in which coal is processed to convert it into coke. As part of the rebuild, Chicago Coke would also make various improvements to the emissions controls on the plant, as further described below. The proposed project requires a construction permit from the Illinois EPA because the plant is a source of emissions and the project involves modifications to the plant.

II. Project Description

Metallurgical coke is produced by "cooking" coal in coke ovens. In the ovens, appropriate coal that is suitable for "coking" is heated at high temperature in an oxygen-free atmosphere. This drives off volatile components in the coal, yielding coke oven gas as a by-product. The solid material remaining behind in the ovens is the coke. In a recovery coke plant, like Chicago Coke's plant, the raw coke oven gas from the coke battery is processed in the by-product plant through a series of processes to recover coal tar, sulfur compounds, ammonia, benzene and certain other organic chemical components. The gaseous material that remains after processing in the by-products plant has fuel value and is used for heating the coke ovens. Support operations at the plant for the coke making process include coal and coke handling and material processing. The plant also has four boilers, which are fired with cleaned coke oven gas and natural gas, that supply heat and power for the coke making process.

This project involves the coke oven battery located in the south side of Chicago that was formerly owned by LTV Steel, Inc. LTV operated the plant until December 2001. In December 2001, LTV discontinued coke production and the battery was put into hot idle mode. In February 2002, the battery was placed into cold idle-mode. On December 30, 2002, the plant was sold to Calumet Transfer Company, LLC and Chicago Coke Company was organized to operate the plant for Calumet Transfer.

Chicago Coke has decided that for effective operation, a "pad-up rebuild" is necessary. The most appropriate time to perform a "pad-up rebuild" is during the current cold idle mode. This "pad-up rebuild" involves rebricking the coke oven battery from the pad up, i.e., it does not involve changes to the existing deck slab or coke oven battery layout or "footprint." However, Chicago Coke will be making various enhancements to the battery and ancillary operations during the "pad-up rebuild" that should improve operation and the level of emissions control. The plant would also be subject to tighter operating and emission limitations such that a significant increase in emissions will not occur.

The planned improvements to the plant include installation of a PROven System in the gas collection system from the battery, to better manage the pressure in the ovens. This is an electronic controller system, called the Pressure Regulated Oven (PROven) System, that should increase the effectiveness of gas collection and emissions control from the coke oven battery. With the PROven System, the gas collecting main is maintained under suction (negative pressure) and the pressure of individual ovens is controlled depending on the stage of the coking cycle, independent of the pressure in the collecting main. Chicago Coke expects that by better management of oven pressure during the coking cycle, the PROven system will reduce the number and extent of leaks from the ovens and reduce the associated emissions.

For emissions of nitrogen oxides (NO_x), enhancements would be made to the existing staged combustion system in the battery. Low NO_x burners would be installed in two of the boilers at the plant, Boilers 1 and 4. Chicago Coke would also replace the steam turbine generator associated with the boiler house with a larger unit, so that the capacity of the turbine does not act to limit the amount of the coke oven gas burned in the boilers. Chicago Coke anticipates that with the larger turbine, less coke oven gas would be flared. This "extra" coke oven gas would be burned in the lower emitting boilers (as compared to flaring).

III. Emissions

Particulate matter (PM), volatile organic material (VOM), nitrogen oxides (NO_x), carbon monoxide (CO) and sulfur dioxide (SO₂) are the principal contaminants emitted from the battery operations, by-products plant, combustion stacks, and support operations. Emissions from the source will generally be limited to the levels shown in Table 1 (attached). This table provides annual limitations for groups of similar emission units. A comparison of the plant's historical actual emissions (see Table 3, attached) to the permitted emissions shows that the project would not be accompanied by a significant increase in emissions, as further described in Table 2 (attached).

Chicago Coke is located in the greater Chicago ozone nonattainment area and a portion of Chicago that is designated nonattainment for PM₁₀. The location of the plant is designated attainment for all other pollutants. Accordingly, the nonattainment New Source Review (NSR) pollutants are PM₁₀/PM, NO_x (8-hour ozone standard) and VOM. The Prevention Significant Deterioration (PSD) pollutants of concern are CO, NO_x and SO₂.

The draft permit would require Chicago Coke to promptly apply for and obtain a future revision to the permit, if needed, to adjust the annual limit for SO₂ emissions, as allowed by the PSD rules. Such a revision could be needed as a result of the data on the sulfur content of the by-product gas that would initially be gathered during actual operation of the plant if it shows significantly different levels of organic sulfur in the gas than the data from other representative coke plants submitted with the application.

Because coal contains trace levels of mercury, the plant would be a source of mercury emissions. However, available information indicates that mercury emissions from the plant, which has a by-products recovery plant, are effectively controlled (greater than 90 percent collection of mercury). Unlike non-recovery coke plants, the coke oven gas is processed by a series of process steps that clean the gas prior to its use as fuel and release to the atmosphere. The draft permit would require Chicago Coke to measure the content of processed coke oven gas and determine the level of overall control being achieved for mercury. If mercury is not being effectively controlled, Chicago Coke would have to evaluate and potentially implement further actions to reduce emissions, including both improvements in the operation of the by-products plant and physical improvements to the plant.

IV. Applicable Emission Standards

All emission sources in Illinois must comply with the Illinois Pollution Control Board's emission standards. The Board's emission standards represent the basic requirements for sources in Illinois. The Board has standards for sources of nitrogen oxides, carbon monoxide, volatile organic material, sulfur dioxide, and particulate matter. The plant complied with the applicable Board standards.

Various operations at the plant are also subject to a number of federal emission standards adopted by the United States EPA. These include both New Source Performance Standards (NSPS) under 40 CFR Part 60 and National Emissions Standards for Hazardous Air Pollutants (NESHAP) under 40 CFR Parts 61 and 63.

40 CFR 60, Subpart D: NSPS for Fossil-Fuel-Fired Steam Generators for Which Construction Is Commenced After August 17, 1971

40 CFR 61, Subpart L: NESHAP for Benzene Emissions from Coke By-Product Recovery Plants

40 CFR 61, Subpart FF: NESHAP for Benzene Waste Operations

40 CFR 63, Subpart L: NESHAP for Coke Oven Batteries

40 CFR 63, Subpart CCCCC: NESHAP for Coke Ovens: Pushing, Quenching, and Battery Stacks*

*These rules became effective April 14, 2003, with a compliance date of April 14, 2006 for existing plants.

V. Regulatory Programs

The application for this project shows that it would not be a major modification for purposes of New Source Review (NSR). As Chicago Coke is located in a nonattainment area for PM₁₀ and ozone, the nonattainment pollutants are PM₁₀, VOM and NO_x (as NO_x is considered a precursor to ozone formation under the 8-hour ozone standard). As described in the attachments, the application showed that the project would not be a major modification for these pollutants under: Major

Stationary Sources Construction and Modification (MSSCAM), 35 IAC Part 203.

The location of the plant is designated attainment for other criteria pollutants. Accordingly the attainment pollutants of concern are CO, SO₂ and NO_x (as NO₂ is also a pollutant independent of its role in ozone formation). As described in the Attachments, the application showed that the project would not be a major modification for these pollutants under Prevention Significant Deterioration (PSD), 40 CFR 52.21.

VI. Proposed Permit

The conditions of the permit summarize applicable regulatory requirements for the plant. In addition to applicable regulations, these include requirements for the plant that were established in the PSD permit originally issued for the plant. The permit would also contain limitations and requirements that are intended to assure that this project would not constitute a major modification under MSSCAM or PSD. For this purpose, as appropriate to ensure practical enforceability, the permit sets limitations on emissions from the plant and various groups of emission units at the plant.

The permit conditions also establish appropriate compliance procedures, including requirements for testing, monitoring, recordkeeping and reporting. Chicago Coke would have to carry out these procedures on an on-going basis to demonstrate that the plant is complying with applicable regulations and operating within the limitations set by the permit.

VII. Request For Comments

It is the Illinois EPA's preliminary determination that the project would meet all applicable state and federal air pollution control requirements, subject to the conditions proposed in the draft permit. The Illinois EPA is therefore proposing to issue a permit for this project.

Comments are requested on this proposed action by the Illinois EPA and the conditions on the draft permit.

Table 1: Annual Emission Limitations (Tons/Year)

	PM	PM ₁₀	SO ₂	VOM	NO _x	CO
Combustion*	58.1	48.2	NA	36.5	1,093.9	NA
Battery						
Doors, Lids, Offtakes & Charging	0.7	0.5	NA	6.2	0.1	NA
Pushing	63.1	33.7	NA	34.6	12.6	NA
Quenching	232.0	23.0	---	---	---	---
By Products Plant						
Fugitive Organic Compounds	---	---	---	3.0	---	---
Ammonium Sulfate System	1.0	1.0	---	---	---	---
Support Operations						
Coal and Coke Handling & Storage	18.0	9.0	---	---	---	---
Material Processing**	42.0	42.0	---	---	---	---
Roads	38.0	14.0	---	---	---	---
Gasoline Storage and Handling	---	---	---	0.1	---	---
TOTALS:	452.9	171.4	232.9	80.4	1,106.6	1,407.9

Note: "NA" Indicates limit not applicable to individual units, only source wide limit.

"*" Does not include unrelated emissions attributable to combustion of natural gas not related to the coke plant.

"**" Includes the Shaker, Breaker, Bunker, Screen and Utility Systems, which are controlled by baghouses.

Table 2: Source Wide Emissions Comparison

	<u>PM</u> <u>(Tons)</u>	<u>PM₁₀</u> <u>(Tons)</u>	<u>SO₂</u> <u>(Tons)</u>	<u>VOM</u> <u>(Tons)</u>	<u>NO_x</u> <u>(Tons)</u>	<u>CO</u> <u>(Tons)</u>
Actual Emissions*	428.4	156.9	193.4	55.9	1,067.1	1,308.3
Potential to Emit	452.9	171.4	232.9	80.4	1,106.6	1,407.8
Difference	24.5	14.5	39.5	24.5	39.5	99.5
Significant Emission Rates**	N/A	15.0	40.0	25.0	40.0	100.0

* For the PSD pollutants (NO_x for the 1-hour standard, SO₂ and CO), the definition of baseline actual emissions is used and is defined as the average rate, in tons per year, at which the emissions unit actually emitted the pollutant during any consecutive 24-month period selected by the owner or operator within the 10-year period immediately preceding either the date the owner or operator begins actual construction of the project, or the date a complete permit application is received by the reviewing authority, whichever is earlier, except that the 10-year period shall not include any period earlier than November 15, 1990 [40 CFR 52.21(b) (48) (ii)].

For the NAA NSR pollutants (NO_x for the 8-hour standard, PM (measured as PM₁₀), PM₁₀, and VOM), actual emissions means the actual rate of annual emissions of a pollutant from an emissions unit as of a particular date. Actual emissions are equal to the average rate in tons per year, at which the emissions unit actually emitted the pollutant during the two-year period which immediately precedes the particular date or such other period that is determined by the Illinois EPA to be representative of normal source operation. Actual emissions shall be calculated using the unit's actual operating hours, production rates, and types of materials processed, stored or combusted during the selected time period; however, the Illinois EPA shall allow the use of a different time period upon a demonstration by the applicant to the Illinois EPA that the time period is more representative of normal source operation. Such demonstration may include, but need not be limited to, operating records or other documentation of events or circumstances indicating that the preceding two years is not representative of normal source operations [35 IAC 203.104].

** For the PSD pollutants, the significant emission rates are defined at 40 CFR 52.21(b) (23). For the NAA NSR pollutants, the significant emission rates are defined at 35 IAC 203.209.

Table 3: Unit-by-Unit Historical Actual* Emissions (Tons)

	PM	PM ₁₀	SO ₂	VOM	NO _x	CO
Combustion	39.3	38.4	150.0	20.0	1,058.7	1,280.1
Battery						
Doors, Lids, Offtakes & Charging	0.1	0.1	0.1	1.6	---	0.4
Pushing	60.0	31.2	43.3	32.6	8.4	27.8
Quenching	231.5	22.7	---	---	---	---
By Products Plant						
Fugitive Organic Compounds	---	---	---	1.6	---	---
Ammonium Sulfate System	0.9	0.9	---	---	---	---
Support Operations						
Coal and Coke Handling & Storage	17.4	8.3	---	---	---	---
Material Processing**	41.9	41.9	---	---	---	---
Other						
Roads	37.3	13.4	---	---	---	---
Gasoline Storage and Handling	---	---	---	0.1	---	---
TOTALS:	428.4	156.9	193.4	55.9	1,067.1	1,308.3

Note: "*" For VOM, the actual emission data is based on the calendar years 2000 and 2001. For all other pollutants, the actual emission data is based on the calendar years 2001 and 2002.

"**" Includes the Shaker, Breaker, Bunker, Screen and Utility Systems, which are controlled by baghouses.