

Illinois Environmental Protection Agency  
Bureau of Air, Permit Section  
Springfield, Illinois

Project Summary for a  
Construction Permit Application from  
Koppers Industries, Inc.  
For a New Tube Heater for  
Tar Distillation System #2 at  
its Manufacturing Plant in  
Cicero, Illinois

Site Identification No.: 031300AAJ  
Application No.: 11100041  
Date Received: October 24, 2011

Schedule

Public Comment Period Begins: May 10, 2012  
Public Comment Period Closes: June 9, 2012

Illinois EPA Contacts

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## I. Introduction

Koppers Industries, Inc. (Koppers) has applied for construction permit for a new heater for Tar Distillation System #2 at its manufacturing plant in Cicero, Illinois. The new heater will replace the existing heater that serves this system.

The Illinois EPA has reviewed the application for a construction permit and made preliminary determination that the application meets applicable requirements. Accordingly, the Illinois EPA has prepared a draft of the construction permit that it would propose to issue for the proposed project. However, before issuing the permit, the Illinois EPA is holding a public comment period to receive comments on the proposed issuance of the construction permit and the terms and conditions of the draft of the construction permit.

## II. Project Description

Tar Distillation System #2 processes crude coal tar to separate out different intermediate streams in the material, such as naphtha and refined chemical oil. The new heater will supply the thermal energy for the distillation process, heating the crude tar that is fed to the distillation column for processing. The new heater will also serve as the afterburner control device for the distillation column in the tar distillation system, combusting the process gases that pass through the condensers on the top of the column. The new heater will replace the existing heater. Like the existing heater, the new heater will use natural gas and process gas from the distillation process as its fuel. The new tube heater will be used in an identical way the existing heater is operated. For this project, Koppers has not requested any changes to the plant-wide emission limits as permitted by its Clean Air Act Permit Program (CAAPP), Permit 96030134.

The new heater would have a natural gas burner with a nominal capacity of 14 mmBtu/hour. It would be constructed from the external shell of an existing heater for the Naphthalene Distillation System, which has been idle for a number of years, and various new components, i.e., new burner systems, fuel train, heat exchange tubing and exhaust stack. The project cost is estimated to be about 40 percent of a comparable new heater.

The principal air contaminants emitted from the heater would be sulfur dioxide (SO<sub>2</sub>) and nitrogen oxide (NO<sub>x</sub>). Volatile organic materials (VOM), carbon oxide (CO), and PM/PM<sub>10</sub> are also emitted as products of combustion. The SO<sub>2</sub> is formed from sulfur compounds, i.e., carbonyl sulfide (COS), hydrogen sulfide (H<sub>2</sub>S) and carbon disulfide (CS<sub>2</sub>), in the process gas. These compounds are oxidized during combustion in the heater, converting the sulfur to SO<sub>2</sub>. The natural gas fuel contains minimal amounts of sulfur. NO<sub>x</sub> can be formed thermally by combination of oxygen and nitrogen in the air at the temperatures at which fuel is burned. Thermal NO<sub>x</sub> is formed during the operation of all common high temperature combustion processes including natural gas tube heater. NO<sub>x</sub> can also be formed from oxidation of any nitrogen in the process gas.

IV. Emissions

A summary of the future permitted or potential emissions of the new heater, as would be provided by the draft permit, is provided below in Table 1. These limits are based on the maximum emission rates provided in the application for operation at the requested level of production. Actual annual emissions of the heater would be less than these limits to the extent that the actual fuel consumption of the heater is lower than projected and the distillation system does not operate at its capacity.

Table 1: Summary of Permitted Emissions  
of the New Heater

Pollutant	Limit
	Tons/Year
CO	13.1
NO <sub>x</sub>	26.2
PM/PM <sub>10</sub>	2.2
SO <sub>2</sub>	181.2
VOM	13.1

V. 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 new heater should readily comply with applicable emission standards of the State of Illinois (35 IAC Subtitle B, Subchapter c), since it will be essentially identical to the existing heater that it would replace.

This project will not affect applicable emission standards for Tar Distillation System #2, as addressed in the current Clean Air Act Permit Program (CAAPP) for the source, Permit 96030134. Pursuant to applicable emission standards, the waste process gas from this system must be controlled by an afterburner or equivalent control device.<sup>1</sup>

VI. Applicability of New Source Review

The proposed project is not a major project for purposes of Prevention of Significant Deterioration (PSD), 40 CFR 52.21 and Major Stationary Sources Construction and Modification (MSSCAM), 35 IAC Part 203, also known as nonattainment new source review (NA NSR). This project is not significant for emissions of pollutants other than SO<sub>2</sub>.

While the project's emissions for SO<sub>2</sub> are significant, Koppers chose to evaluate the net change in SO<sub>2</sub> emissions at the source, considering the

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<sup>1</sup> Tar Distillation System #2 is not subject to the National Emission Standards for Organic Hazardous Air Pollutants (NESHAP) from the Synthetic Organic Chemical Manufacturing Industry, etc., 40 CFR 63 Subparts F, G, and H because the primary products manufactured by the system are not listed in 40 CFR 63.100(b)(1)(i) or (b)(1)(ii).

Tar Distillation System #2 is not subject to New Source Performance Standards (NSPS) for Volatile Organic Compound (VOC) Emissions From Synthetic Organic Chemical Manufacturing Industry (SOCMI) Distillation Operations, 40 CFR 60 Subpart NNN. This is because construction of the system commenced prior to December 30, 1983 and this project, which involves the heater for the system, would not entail a modification of this system for purposes of this NSPS.

decrease in emissions of SO<sub>2</sub> that will accompany the shutdown of the existing heater. This evaluation involves summing all creditable increases and decreases in SO<sub>2</sub> emissions for the project as well as other creditable increases and decreases that have occurred over the contemporaneous time period. The results of this evaluation show that the net changes in SO<sub>2</sub> emissions for this project will be less than significant, i.e., an increase of 28.7 tons per year compared to the 40.0 ton per year significant emission rate for SO<sub>2</sub>. The project shows an increase in SO<sub>2</sub> emissions because MSSCAM requires that this analysis account for the potential operation of the system and maximum sulfur content of waste gas, as compared to the actual levels of operation and actual levels of sulfur in process gas, which are the basis for data for past actual SO<sub>2</sub> emissions. A summary of this evaluation is provided in Attachment 1 of the draft permit.

#### VII. Draft Permit

The permit for the new heater would set forth the air pollution control requirements that apply to the heater, including the applicable emission standards. They also include the measures that must be used as good air pollution control practices to minimize emissions.

The permit would also establish requirements for the sampling and analyzing process waste gas for its sulfur content. It also sets limits on the emissions of the new heater. In addition to annual limits on emissions, the permit includes short-term emission limits. Operational monitoring is also required for the new heater as it serves as an afterburner for the process gases from the system, as needed to provide practical enforceability of emission limits.

The permit also establishes appropriate compliance procedures for the new tube heater, including requirements for emission testing, required work practices, operational monitoring, recordkeeping, and reporting. These measures are imposed to assure that the operation and emissions of the system are appropriately tracked to confirm compliance with both the short-term and annual emission limits established for emission units.

#### VIII. Request for Comments

It is the Illinois EPA's preliminary determination that the application for this project meets all applicable state and federal air pollution control requirements. The Illinois EPA is therefore proposing to issue a construction permit for this project.

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

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