

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

BUREAU OF AIR

DIVISION of AIR POLLUTION CONTROL

PERMIT SECTION

PROJECT SUMMARY for the
DRAFT CLEAN AIR ACT PERMIT PROGRAM (CAAPP) PERMIT

Cabot Corporation, Cab-O-Sil Division
700 East U.S. Highway 36
Tuscola, Illinois 61953-9643

Illinois EPA ID Number: 041808AAH

Application Number: 96030080

Application Type: CAAPP Renewal

Start of Public Comment Period: March 11, 2008

Close of Public Comment Period: April 10, 2008

Permit Engineer/Technical Contact: Dan Punzak, 217/782-2113

Community Relations/Comments Contact: Brad Frost, 217/782-7027

(This Project Summary generally describes the source and explains the draft permit. This document has been prepared pursuant to Section 39.5(8)(b) of the Illinois Environmental Protection Act, which requires "a statement that sets forth the legal and factual basis for the draft CAAPP permit conditions.")

I. INTRODUCTION

This source has applied for a renewal of its Clean Air Act Permit Program (CAAPP) operating permit. The CAAPP is the program established in Illinois for operating permits for significant stationary sources as required by Title V of the federal Clean Air Act and Section 39.5 of Illinois' Environmental Protection Act. The conditions in a CAAPP permit are enforceable by the Illinois Environmental Protection Agency (Illinois EPA), the USEPA, and the public. This document is for informational purposes only and does not shield the Permittee from enforcement actions or its responsibility to comply with applicable regulations. This document shall not constitute a defense to a violation of the Act or any rule or regulation.

A CAAPP permit contains conditions identifying the applicable state and federal air pollution control requirements that apply to a source. The permit also establishes emission limits, appropriate compliance procedures, and specific operational flexibility. The appropriate compliance procedures may include monitoring, record keeping, and reporting to show compliance with these requirements. The Permittee must carry out these procedures on an on-going basis to demonstrate that the source is operating in accordance with the requirements of the permit. Further explanations of the specific provisions of the draft CAAPP permit are contained in the attachments to this document, which also identify the various emission units at the source.

II. GENERAL SOURCE DESCRIPTION

a. Nature of source

The source produces fumed metal oxides by the flame hydrolysis of a blend of chlorosilanes, silicon tetrachloride, methyl trichlorosilane, trichlorosilane, and aluminum trichloride. HCl gas is a by-product of the reaction and it is absorbed into water and sold as hydrochloric acid or disposed of. The source also operates several other related operations where the fumed metal oxides are treated to produce specific products. Also included are several research facilities on-site for the development of both treated and untreated products.

b. Ambient air quality status for the area

The source is located in an area that is currently designated attainment or unclassifiable for the National Ambient Air Quality Standards for all criteria pollutants (carbon monoxide, lead, nitrogen dioxide, ozone, PM_{2.5}, PM₁₀, sulfur dioxide).

c. Major source status

1. The source requires a CAAPP permit as a major source of CO and HAP emissions.
 2. The source requires a CAAPP permit because the source is considered a single source with Air Products and Chemicals, I.D. No. 041808AAM, located at 700 East U.S. Highway 36 West in Tuscola. The Permittees have elected to obtain separate CAAPP permits for their operations.
- d. Source Emissions

The following table lists annual emissions of criteria pollutants from this source, as reported in the Annual Emission Reports sent to the Illinois EPA.

Pollutant	Annual Emissions (tons)				
	2006	2005	2004	2003	2002
CO	314.12	239.4	254.28	340.89	277.0
NO _x	2.40	2.37	2.37	2.37	----
PM	1.32	1.19	0.65	0.18	1.17
SO ₂	0.01	0.01	0.01	0.01	----
VOM	2.73	1.93	2.56	4.25	3.8
Chlorine (top HAP)	91.45	53.00	36.52	64.04	61.16
HCl (2 nd HAP)	21.27	9.01	14.92	6.64	11.52

III. NEW SOURCE REVIEW/TITLE I CONDITIONS

This draft permit contains terms and conditions that address the applicability of permit programs for new and modified sources under Title I of the Clean Air Act (CAA) and regulations promulgated thereunder, including 40 CFR 52.21, Prevention of Significant Deterioration (PSD) and 35 IAC Part 203, Major Stationary Sources Construction and Modification. Any such terms and conditions are identified within the draft permit by T1, T1R, or T1N. Any conditions established in a construction permit pursuant to Title I and not revised or deleted in this draft permit, remain in effect pursuant to Title I provisions until such time that the Illinois EPA revises or deletes them. Where the source has requested that the Illinois EPA establish new conditions or revise such conditions in a Title I permit, those conditions are consistent with the information provided in the CAAPP application and will remain in effect pursuant to Title I provisions until such time that the Illinois EPA revises or deletes them.

This draft permit would establish new Title I requirements.

IV. COMPLIANCE INFORMATION

The source has certified compliance with all applicable rules and regulations; therefore, a compliance schedule is not required for this source. In addition, the draft permit requires the source to certify its compliance status on an annual basis.

V. PROPOSED ILLINOIS EPA ACTION/REQUEST FOR COMMENTS

It is the Illinois EPA's preliminary determination that this source's permit application meets the standards for issuance of a CAAPP permit. The Illinois EPA is therefore proposing to issue a CAAPP permit, subject to the conditions proposed in the draft permit.

Comments are requested by the Illinois EPA for the draft or proposed permit, pursuant to 35 IAC Part 252 and Sections 39.5(8) and (9) of the Illinois Environmental Protection Act. A final decision on the draft or proposed permit will not be made until the public, affected states, and USEPA have had an opportunity to comment. The Illinois EPA is not required to accept recommendations that are not based on applicable requirements. If substantial public interest is shown in this matter, the Illinois EPA will consider holding a public hearing in accordance with 35 IAC Part 166.

ATTACHMENT 1: Summary of Source-Wide Requirements

The following table indicates the source-wide emissions control programs and planning requirements that are applicable to this source. These programs are addressed in Sections 5 and 6 of the draft permit.

Program/Plan	Applicable
Emissions Reduction Market System (ERMS)	No
Nitrogen Oxides (NO _x) Trading Program	No
Acid Rain Program	No
Compliance Assurance Monitoring (CAM) Plan ^a	Yes
Fugitive Particulate Matter (PM) Operating Program	No
Risk Management Plan (RMP)	Yes
PM ₁₀ Contingency Measure Plan	No

- a. Compliance Assurance Monitoring (CAM) is a program for pollutant-specific emission units which use an add-on control device to achieve compliance with an emission limitation or standard. A CAM plan is required for such units that have potential pre-control device emissions of the applicable regulated air pollutant that are equal to or greater than major source threshold levels, and are not specifically exempt by 40 CFR Part 64. Subject units and the CAM plans are identified in Attachment 3 of the draft permit.

The RMP is a program for reducing the levels of emissions during an emergency, consistent with safe operating procedures (Section 112(r) of the federal Clean Air Act). The program requires the immediate implementation the appropriate steps described in this plan should an emergency be declared. The Permittee is required to maintain and have this plan on file with the USEPA.

ATTACHMENT 2: Summary of Requirements for Specific Emission Units

The following tables include information on the requirements that apply to significant emission units at this source. The requirements are found in Section 7 of the draft permit, which is further divided into subsection, i.e., Section 7.1, 7.2, etc., for the different categories of units at the source. A separate table is provided for each subsection in Section 7 of the draft permit. An explanation of acronyms and abbreviations is contained in Section 2 of the draft permit.

Table 1 (Section 7.1 of the draft permit)

Emission Unit - Fumed Metal Oxide Manufacturing	
Description	Several process lines operate in a similar manner but there are minor variations. Each of the lines combust with air and hydrogen one or more of the following materials: silicon tetrachloride, methyl trichlorosilane, trichlorosilane, and aluminum trichloride.
Date Constructed	A 1992 construction permit classifies all of the units as new.
Emission Control Equipment	Dry filters for material handling. Wet scrubber on one process.
Applicable Rules and Requirements	
Emission Standards	<ul style="list-style-type: none"> • 35 IAC 212 Subpart B (opacity) and Subpart L (PM). • 40 CFR 63 Subpart NNNNN for Hydrochloric Acid Production). Although the rule became effective on April 17, 2006, the Permittee has been operating under an Early Reduction Program and thus has a six year extension to comply with the standard in Subpart NNNNN or April 17, 2012. Since this is a future rule it has been placed in Section 5 under future emission standards but when it becomes applicable it will be in Section 7.1.
Streamlining	N/A
Title I Conditions	<ul style="list-style-type: none"> • The draft permit contains limits on operation and emissions in Conditions 7.1.5 and 7.1.6. These limits were incorporated from Permit 92060026.

Emission Unit - Fumed Metal Oxide Manufacturing	
Non-applicability	<ul style="list-style-type: none"> • 40 CFR 60 Subpart III for Air Oxidation Processes: The reason for nonapplicability is explained in detail in the permit. • 35 IAC 216.362 for CO emissions: The reason for nonapplicability is explained in detail in the permit. • 40 CFR 64 (CAM) for the tall stack: The reason for nonapplicability is explained in detail in the permit. • 40 CFR 64 (CAM) for the “E” Unit: The reason for nonapplicability is explained in detail in the permit.
Periodic Monitoring (other than basic regulatory requirements)	
Testing	<ul style="list-style-type: none"> • Scrubbant checked daily for suspended solids.
Emissions Monitoring	<ul style="list-style-type: none"> • The tall stack has a CEM that uses a mass spectrometer to measure chlorine, chloromethanes, hydrogen chloride and carbon monoxide.
Operational Monitoring	<ul style="list-style-type: none"> • The methane injection system has a temperature sensor and strip chart recorder or disk storage. • Each baghouse has a gauge to measure differential pressure across the filter. • Bagfilters subject to CAM
Inspections	N/A
Recordkeeping	<ul style="list-style-type: none"> • CAM and other monitoring data. • Operation, maintenance and calibration of the monitoring systems. • Verification of operating requirements of Condition 7.1.5.
Other	
Reporting	
Prompt Reporting	<ul style="list-style-type: none"> • Exceedance of BACT limits in Condition 7.1.5 or emission limits in 7.1.6. Generally prompt reporting is 30 days but the BACT limit violations will have to be initially reported in 5 days and a follow-up report in 15 days.
Other Reporting	<ul style="list-style-type: none"> • CAM reporting • CEM reporting
Other Information	
Footnotes	

Table 2 (Section 7.2 of the draft permit)

Emission Unit - Treated Silica Process	
Description	The material produced in Section 7.1 is further treated but result in different typed of emissions.
Date Constructed	Various from 1987 to 1996
Emission Control Equipment	Bagfilters
Applicable Rules and Requirements	
Emission Standards	<ul style="list-style-type: none"> • 35 IAC 212 Subpart B (opacity) and Subpart L (PM). • 35 IAC 215 Subpart G (8/lb/hr rule for VOM).
Streamlining	N/A
Title I Conditions	<ul style="list-style-type: none"> • The draft permit contains limits on operation and emissions in Conditions 7.1.5 and 7.1.6. These limits were incorporated from Permits 72110408, 91120069, 96010073, 06110065 and 07040003
Non-applicability	<ul style="list-style-type: none"> • None
Periodic Monitoring (other than basic regulatory requirements)	
Testing	N/A
Emissions Monitoring	
Operational Monitoring	<ul style="list-style-type: none"> • CAM
Inspections	N/A
Recordkeeping	<ul style="list-style-type: none"> • CAM, amount of material processed and emissions.
Other	
Reporting	
Prompt Reporting	<ul style="list-style-type: none"> • Exceedance of rule limits or emission limits in Condition 7.2.6.
Other Reporting	

Emission Unit - Treated Silica Process	
Other Information	
Footnotes	

Table 3 (Section 7.3 of the draft permit)

Emission Unit - Advanced Material Development Center (AMDC) and Treatment Development Center (TDC)	
Description	AMDC evaluates alternative production techniques and TDC is a research facility.
Date Constructed	1998/1999
Emission Control Equipment	Thermal Oxidizer, Condensers, Scrubber, and Baghouses as Needed
Applicable Rules and Requirements	
Emission Standards	<ul style="list-style-type: none"> • 35 IAC 212 Subpart B (opacity) and Subpart L (PM). • 35 IAC 215 subpart K.
Streamlining	N/A
Title I Conditions	<ul style="list-style-type: none"> • The draft permit contains limits on operation and emissions in Conditions 7.1.5 and 7.1.6. These limits were incorporated from Permit 96080109 and 07070013.
Non-applicability	<ul style="list-style-type: none"> • CAM because the precontrol emissions are not major.
Periodic Monitoring (other than basic regulatory requirements)	
Testing	N/A
Emissions Monitoring	N/A
Operational Monitoring	<ul style="list-style-type: none"> • CAM • Observe visible emissions.
Inspections	<ul style="list-style-type: none"> • Periodic inspections of control equipment.
Recordkeeping	<ul style="list-style-type: none"> • CAM, visible emissions observations, amount of material processed and emissions.
Other	
Reporting	
Prompt Reporting	<ul style="list-style-type: none"> • Exceedance of the rules in Condition 7.3.3, the emission limits in 7.3.6.

Emission Unit -	Advanced Material Development Center (AMDC) and Treatment Development Center (TDC)
Other Reporting	• CAM
Other Information	
Footnotes	

Table 4 (Section 7.4 of the draft permit)

Emission Unit - HCl Storage and Loading Area and Small Gasoline Storage Tank	
Description	HCl Storage tanks, HCl loadout area and two small gasoline storage tanks.
Date Constructed	1974
Emission Control Equipment	Scrubber on each storage tank.
Applicable Rules and Requirements	
Emission Standards	<ul style="list-style-type: none"> • 40 CFR 63 Subpart NNNNN for Hydrochloric Acid Production). Although the rule became effective on April 17, 2006, the Permittee has been operating under an Early Reduction Program and thus has a six year extension to comply with the standard in Subpart NNNNN or April 17, 2012. Since this is a future rule it has been placed in Section 5 under future emission standards but when it becomes applicable it will be in Section 7.1. • Hydrochloric acid can be emitted as in aerosol and is thus subject to 35 IAC 212.321 for PM. • The gasoline storage tanks are subject to 35 IAC 215.122(b) which requires a submerged loading pipe be used when filling the tank.
Streamlining	N/A
Title I Conditions	<ul style="list-style-type: none"> • None
Non-applicability	<ul style="list-style-type: none"> • 35 IAC 215.583: The reason for nonapplicability is explained in detail in the permit. • CAM for storage tanks and loadout area: The reason for nonapplicability is explained in detail in the permit.
Periodic Monitoring (other than basic regulatory requirements)	
Testing	<ul style="list-style-type: none"> • Each of the HCl storage tanks shall undergo an annual certification of tank thickness.
Emissions Monitoring	N/A
Operational Monitoring	<ul style="list-style-type: none"> • Scrubbant flow to each scrubber.

Emission Unit - HCl Storage and Loading Area and Small Gasoline Storage Tank	
Inspections	<ul style="list-style-type: none"> • Every other year the gasoline storage tanks shall have the submerged loading pipe inspected.
Recordkeeping	<ul style="list-style-type: none"> • Scrubbant flow rate. • Good operating practices. • HCl and VOM emissions.
Other	
Reporting	
Prompt Reporting	<ul style="list-style-type: none"> • Exceedance of Condition 7.4.3(e). • Failure to perform wall thickness test. • Loadout of acid when the scrubber is not operating.
Other Reporting	
Other Information	
Footnotes	

Table 5 (Section 7.5 of the draft permit)

Emission Unit - Jet Mill Process	
Description	This process classifies the product by particle size and then stores the product
Date Constructed	2000
Emission Control Equipment	Baghouses
Applicable Rules and Requirements	
Emission Standards	<ul style="list-style-type: none"> • 35 IAC 212 Subpart B (opacity) and Subpart L (PM).
Streamlining	N/A
Title I Conditions	<ul style="list-style-type: none"> • The draft permit contains limits on operation and emissions in Conditions 7.1.5 and 7.1.6. These limits were incorporated from Permit 99080064.
Non-applicability	<ul style="list-style-type: none"> • CAM: The reason for nonapplicability is explained in detail in the permit.
Periodic Monitoring (other than basic regulatory requirements)	
Testing	N/A
Emissions Monitoring	
Operational Monitoring	<ul style="list-style-type: none"> • Differential pressure across the filters.
Inspections	N/A
Recordkeeping	<ul style="list-style-type: none"> • Pressure drop across the filters.
Other	
Reporting	
Prompt Reporting	<ul style="list-style-type: none"> • Exceedance of Conditions 7.5.3 or 7.5.6.
Other Reporting	
Other Information	
Footnotes	

Table 6 (Section 7.6 of the draft permit)

Emission Unit - Bag Emptying Process and D Unit Bulk Loadout	
Description	Some bags of product may be returned and the bag is slit and the material sent to storage. Other product is sent out in railcars.
Date Constructed	1993
Emission Control Equipment	Baghouses
Applicable Rules and Requirements	
Emission Standards	<ul style="list-style-type: none"> • 35 IAC 212 Subpart B (opacity) and Subpart L (PM).
Streamlining	N/A
Title I Conditions	<ul style="list-style-type: none"> • The draft permit contains limits on operation and emissions in Conditions 7.1.5 and 7.1.6. These limits were incorporated from Permit?
Non-applicability	<ul style="list-style-type: none"> • CAM: The reason for nonapplicability is explained in detail in the permit.
Periodic Monitoring (other than basic regulatory requirements)	
Testing	N/A
Emissions Monitoring	
Operational Monitoring	<ul style="list-style-type: none"> • Differential pressure across the filters.
Inspections	
Recordkeeping	<ul style="list-style-type: none"> • Pressure drop across the filters. • PM emissions.
Other	
Reporting	
Prompt Reporting	<ul style="list-style-type: none"> • Exceedance of Conditions 7.63 or 7.6.6.
Other Reporting	
Other Information	

Emission Unit - Bag Emptying Process and D Unit Bulk Loadout	
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Footnotes	
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ATTACHMENT 3: Prompt Reporting of Deviations

Prompt reporting of deviations is critical in order to have timely notice of deviations and the opportunity to respond, if necessary. The effectiveness of the permit depends upon, among other important elements, timely and accurate reporting. The Illinois EPA, USEPA and the public rely on timely and accurate reports submitted by the permittee to measure compliance and to direct investigation and follow-up activities. Prompt reporting is evidence of a permittee's good faith in disclosing deviations and describing the steps taken to return to compliance and prevent similar incidents.

Any occurrence that results in an excursion from any emission limitation, operating condition, or work practice standard as specified in this CAAPP permit is a deviation subject to prompt reporting. Additionally, any failure to comply with any permit term or condition is a deviation of that permit term or condition and must be reported to the Illinois EPA as a permit deviation. The deviation may or may not be a violation of an emission limitation or standard. A permit deviation can exist even though other indicators of compliance suggest that no emissions violation or exceedance has occurred. Reporting permit deviations does not necessarily result in enforcement action. The Illinois EPA has the discretion to take enforcement action for permit deviations that may or may not constitute an emission limitation or standard or the like, as necessary and appropriate.

Section 39.5(7)(f)(ii) of the Illinois Environmental Protection Act, which mirrors 40 CFR 70.6(a)(3)(iii)(B), requires prompt reporting of deviations from the permit requirements. The permitting authority (in this case, Illinois EPA) has the discretion to define "prompt" in relation to the degree and type of deviation likely to occur. Furthermore, Section 39.5(7)(f)(i) of the Illinois Environmental Protection Act, which mirrors 40 CFR 70.6(a)(3)(iii)(A) requires that monitoring reports must be submitted at least every 6 months. Therefore, USEPA generally considers anything less than 6 months to be "prompt" as long as the selected time frame is justified appropriately (60 Fed. Reg. 36083, 36086 (July 13, 1995)).

The USEPA has stated that, for purposes of administrative efficiency and clarity, it is acceptable to define prompt in each individual permit. *Id.* The Illinois EPA has elected to follow this approach and defines prompt reporting on a permit by permit basis. In instances where the underlying applicable requirement contains "prompt" reporting, this frequency or a shorter frequency of reporting is the required timeframe used in this permit. Where the underlying applicable requirement fails to explicitly set forth the timeframe for reporting deviations, the Illinois EPA has developed a structured manner to determine the reporting approach used in this permit.

The Illinois EPA generally uses a time frame of 30 days to define prompt reporting of most deviations. Also, for certain permit conditions in individual permits, the Illinois EPA may require an alternate timeframe that is less than 30 days if the permit requirement justifies a shorter reporting time period. Under certain circumstances, EPA may establish a deviation

reporting period longer than 30 days, but, in no event exceeding 6 months. Where it has established a deviation reporting period other than 30 days in an individual permit (specifically Section 7.x.10), the Illinois EPA has explained the reason for the alternative timeframe. (See Attachment 2 of this Project Summary.)

The timing for certain deviation reporting may be different when a source or emission unit at a source warrants reporting to address operation, independent of the occurrence of any deviations. This is the case for a source that is required to perform continuous monitoring for the emission unit, for which quarterly or semi-annual “monitoring” reports are appropriate. Where appropriate, reporting of deviations has generally been combined in, or coordinated with these quarterly or semi-annual reports, so that the overall performance of the plant can be reviewed in a comprehensive fashion. This will allow a more effective and efficient review of the overall performance of the source by the Illinois EPA and other interested parties, as well as by the source itself.

At the same time, there are certain deviations for which quicker reporting is appropriate. These are deviations for which individual attention or concern may be warranted by the Illinois EPA, USEPA, and other interested parties. Under this scenario, emphasis has been placed primarily on deviations that could represent substantial violations of applicable emission standards or lapses in control measures at the source. For these purposes, depending on the deviation, immediate notification may be required and preceded by a follow-up report submitted within 15 days, during which time the source may further assess the deviation and prepare its detailed plan of corrective action.

In determining the timeframe for prompt reporting, the Illinois EPA assesses a variety of criteria such as:

- historical ability to remain in continued compliance,
- level of public interest in a specific pollutant and/or source,
- seriousness of the deviation and potential to cause harm,
- importance of applicable requirement to achieving environmental goals,
- designation of the area (i.e., non-attainment or attainment),
- consistency among industry type and category,
- frequency of required continuous monitoring reports (i.e., quarterly),
- type of monitoring (inspection, emissions, operational, etc.), and
- air pollution control device type and operation

These prompt reporting decisions reflect the Illinois EPA’s consideration of the possible nature of deviations by different emission units and the responses that might be required or taken for those different types of deviations. As a consequence, the conditions for different emission units may identify types of deviations which include but are not limited to: 1) Immediate (or very

quick) notification; 2) Notification within 30 days as the standard; or 3) Notification with regular quarterly or semi-annual monitoring reports.

The Illinois EPA's decision to use the above stated prompt reporting approach for deviations as it pertains to establishing a shorter timeframe in certain circumstances reflects the criteria discussed as well as USEPA guidance on the topic.

- 40 CFR 71.6(a)(3)(iii)(B) specifies that certain potentially serious deviations must be reported within 24 or 48 hours, but provides for semi-annual reporting of other deviations. (Serious or severe consequences)
- FR Vol. 60, No. 134, July 13, 1995, pg. 36086 states that prompt should generally be defined as requiring reporting within two to ten days of the deviation, but longer time periods may be acceptable for a source with a low level of excess emissions. (intermediate consequences)
- Policy Statement typically referred to as the "Audit Policy" published by the USEPA defines prompt disclosure to be within 21 days of discovery. (Standard for most "pollutant limiting" related conditions)
- Responses to various States by USEPA regarding other States' definition of prompt.

As a result, the Illinois EPA's approach to prompt reporting for deviations as discussed herein is consistent with the requirements of 39.5(7)(f)(ii) of the Act as well as 40 CFR part 70 and the CAA. This reporting arrangement is designed so that the source will appropriately notify the Illinois EPA of those events that might warrant individual attention. The timing for these event-specific notifications is necessary and appropriate as it gives the source enough time to conduct a thorough investigation into the causes of an event, collecting any necessary data, and to develop preventative measures, to reduce the likelihood of similar events, all of which must be addressed in the notification for the deviation.

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