



# ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

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JB PRITZKER, GOVERNOR

JOHN J. KIM, DIRECTOR

217/785-1705

CONSTRUCTION PERMIT  
NSPS/NESHAP SOURCE

PERMITTEE

Vantage Specialties, Inc.  
Attn: Joe Lafferty  
3938 Porett Drive  
Gurnee, Illinois 60031

Application No.: 19100015

I.D. No.: 097035AAQ

Applicant's Designation:

Date Received: October 22, 2019

Subject: Annual Cap on Emissions of Ethylene Oxide

Date Issued: Draft

Source Location: 3938 Porett Drive, Gurnee, Lake County

This Construction Permit is hereby granted to the above-designated Permittee for the source at the above location setting an annual cap on the emissions of ethylene oxide of this source and requirements related to this emissions cap pursuant to the above-referenced permit application. This Permit is subject to standard conditions attached hereto and the following conditions.

If you have any questions on this permit, please contact Daniel Rowell.

Raymond E. Pilapil  
Manager, Permit Section  
Bureau of Air

REP:DBR:

Conditions for this Permit

Part 1: General Conditions

1. Introduction

- a. This permit sets an annual cap on the emissions of ethylene oxide of this source. It also sets accompanying requirements on the Permittee for emissions monitoring, operational monitoring, monitoring of components for leaks, recordkeeping and reporting related to emissions of ethylene oxide to address compliance with this cap. This cap and associated requirements are imposed on the Permittee pursuant to Senate Bill 1854, adopted by 101<sup>st</sup> Session of the Illinois General Assembly as Public Act 101-0023 (the "new law"). As this source uses and emits ethylene oxide, the new law requires the Permittee to obtain a permit from the Illinois EPA that is consistent with the requirements of this law. In issuing such permit, the Illinois EPA must "...impose a site-specific annual cap on ethylene oxide emissions set to protect the public health." This construction permit imposes this cap and associated requirements as they are measures that will act to reduce or control emissions of ethylene oxide of this source.
- b. This permit does not authorize changes to this source that would increase its production capacity or its emissions of ethylene oxide.
- c. For purposes of this permit:
  - i. The equipment at this source that emits or may emit ethylene oxide through a vent or stack is referred to as the "affected process equipment." The affected process equipment includes the six alkoxylation reactors in the Alkoxylation Area at this source, whose vent streams are controlled. (The affected process equipment is specifically addressed in Conditions 11 to 17 of this permit.)
  - ii. The equipment at this source that emits or may emit fugitive emissions of ethylene oxide, including pumps, pressure relief devices, valves, sampling connections, flanges or other connectors, compressors (if any), and closed vent systems, is referred to as the "affected components." (The affected components are specifically addressed in Conditions 18 to 22 of this permit.)
  - iii. The combination of the affected process equipment and the affected components is referred to as the "affected facility."

2. Existing Regulatory and Statutory Requirements

- a. This permit does not affect the applicability of existing emission standards for the affected facility and associated regulatory requirements for testing, monitoring, recordkeeping and reporting related to emissions, as are addressed in other permits. In particular, the affected facility will continue to be subject to the requirements of the federal New Source Performance Standards (NSPS) for Equipment Leaks of VOC in the Synthetic Organic Chemicals Manufacturing Industry for Which Construction,

Reconstruction, or Modification Commenced After November 7, 2006, 40 CFR 60 Subpart VVa, as is addressed by Condition 2(b) of Construction Permit 15110027.

- b. This permit does not excuse the Permittee from the obligation to submit a plan to the Illinois EPA describing how the Permittee will continuously collect emissions information and to then implement the approved plan, as is required by the new law.
- c. This permit does not relieve the Permittee of the responsibility to comply with all Local, State and Federal Regulations which are part of the applicable Illinois State Implementation Plan, as well as other applicable Federal, State and Local requirements.

3. Emissions Cap

- a. The emissions of ethylene oxide of the source on a calendar year basis shall not exceed 110 pounds/year, of which no more than 60 pounds/year shall be fugitive emissions from affected components. Compliance with this limit shall be determined from the emissions of ethylene oxide during the calendar year from affected process equipment and affected components, with the first determination of compliance addressing calendar year 2020 (i.e., the period of January 2020 through December 2020). For the purpose of this limit, emissions shall be determined in accordance with the requirements of this permit and the provisions of the plan for collection of emission information required by the new law, provided however that the requirements of this permit may be superseded by a subsequent air pollution control permit for the source issued by the Illinois EPA.

4. General Requirements for Good Air Pollution Control Practice

- a. At all times, the Permittee shall maintain and operate the affected facility, including the emission control system and required monitoring equipment, in a manner consistent with good air pollution control practice for minimizing emissions.

5. Recordkeeping for the Affected Facility

- a. The Permittee shall maintain records of the usage of ethylene oxide by the Alkoxylation Area (tons/month and tons/year).
- b. The Permittee shall maintain records for the emissions of ethylene oxide from the affected process equipment and the affected components as further specified in other conditions of this permit and of the total emissions of ethylene oxide of the affected facility to address compliance with the emissions cap in Condition 3(a).

6. Requirements for Retention and Availability of Required Records

- a. The Permittee shall retain all records, including logs, required by this permit for at least five years from the date of entry unless a longer retention period is specified by a particular provision and keep the records at a location at the facility that is readily accessible to the Illinois EPA and USEPA.

- b. The Permittee shall make records available for inspection and copying by the Illinois EPA or USEPA upon request, including retrieving and printing on paper 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 facility inspection, or provide an electronic copy of such information in a format that is acceptable to the agency making the request.

7. Reporting Requirements for the Affected Facility

- a. i. The Permittee shall submit quarterly reports to the Illinois EPA that include the following information. These reports shall be submitted within 30 days of the end of each calendar quarter.
  - A. For the first, second and third quarters for a calendar year: 1) The cumulative emissions of ethylene oxide in the calendar year from the affected facility in total and from affected components based on emission data collected through such period(s) and, 2) If cumulative emissions are more than 25, 50 or 75 percent, respectively, of the emission cap in Condition 3(a), a discussion of whether these cumulative emissions were the result of circumstances that are expected to be present in the remainder of the calendar year.
  - B. The information required to be reported in these quarterly reports by other conditions of this permit.
  - C. A summary of the notifications required to be submitted by other conditions of this permit for deviations from the requirements of this permit, if any, during the quarter.
- ii. With the quarterly report for the fourth quarter in each calendar year, the Permittee shall report: 1) Emissions of ethylene oxide of the affected facility and from affected components for the calendar year, and 2) If emissions exceed the emission cap in Condition 3(a), provide the notification for the deviation from this cap pursuant to Condition 7(b) in this quarterly report.
- b. i. The Permittee shall notify the Illinois EPA of deviation(s) from the requirements of this construction permit, which notifications shall include information describing the deviation(s), the probable cause of the deviation(s), the corrective actions taken, and any preventative measures taken.
- ii. Unless otherwise provided by this permit or in an operating permit for the source that addresses the requirements of this construction permit, these notifications shall be submitted to the Illinois EPA within five days of the deviation. For this purpose, the Permittee may submit an initial notification within five days of the deviation with a follow-up notification submitted within 30 days of the deviation if more time is needed to fully investigate the deviation and assemble the information that must be

included in such notifications. In such case, the initial notification need only include information describing the deviation and the corrective actions that were taken.

8. Addresses for the Illinois EPA

- a. Notifications and reports required by this permit shall be sent to:

Illinois Environmental Protection Agency  
Bureau of Air, Compliance Section (#40)  
1021 North Grand Avenue, East  
P.O. Box 19276  
Springfield, Illinois 62794-9276  
  
Telephone: 217/782-5811

- b. In addition, a copy of each report for certification of the emission monitoring systems required by this permit shall also be sent electronically to the Illinois EPA, Bureau of Air, Compliance Section, Source Monitoring Unit, using the State of Illinois File Transfer Website, unless otherwise instructed by the Illinois EPA:

<http://filet.illinois.gov>

Recipient Email Address: EPA.BOA.SMU@illinois.gov  
File Transfer Email Subject: Vantage, Gurnee  
Illinois EPA I.D. 097035AAQ

9. Effective Date of the Permit

- a. This permit will take effect on December 18, 2019 if any ethylene oxide is present at this source on this date or otherwise on such subsequent date after December 18, 2019 that ethylene oxide is received at this source. This condition supersedes Standard Condition 1.

10. Provisions for Reopening of the Permit

- a. The Illinois EPA may, as specifically provided for by the new law, reopen this permit if the Illinois EPA determines that the emissions of ethylene oxide from this source pose a risk to the public health as defined by the Illinois EPA.

Part 2: Permit Conditions for Affected Process Equipment

11. Introduction

The "affected process equipment" is the equipment at this source that emits or may emit ethylene oxide through a vent or stack. The affected process equipment includes the six reactors in the Alkoxylation Area at this source. The vent streams of these emission units are controlled by an emission control system (the "affected emission control system"). The affected emission control system consists of a scrubber followed by a dry bed absorption (DBA) device. The scrubber uses a water-acid solution to remove ethylene oxide from the vent streams by conversion to ethylene glycol. The DBA device uses an absorbent media to further reduce emissions of ethylene oxide. The DBA device has two separate pairs of beds so that operation is not interrupted by the periodic replacement of the media in the beds.

12. Operation of Affected Emission Control System

- a. The Permittee shall operate the affected emission control system at all times that a process gas stream containing any ethylene oxide is ducted to it from any affected process equipment.
- b. Internal inspections, maintenance and repair of the affected emission control system shall be conducted without interrupting the control of emissions.

13. Emissions Monitoring

- a. The Permittee shall install, operate, calibrate and maintain a continuous emissions monitoring system (CEMS) on the stack of the affected emission control system to measure the concentration of ethylene oxide in the exhaust stream in parts per billion by volume (ppbv). This monitoring system shall be designed and operated to meet the requirements in USEPA's Performance Specification 15 (PS-15), "Performance Specifications for Extractive Fourier Transform Infrared Spectroscopy (FTIR) Continuous Emissions Monitor Systems in Stationary Sources," and to maintain a limit of quantification that is no greater than 20 ppbv.
- b. The Permittee shall install, operate, calibrate and maintain a continuous monitoring system (CMS) for the affected emission control system to measure the gas flow rate so as to be able to determine the mass emissions of the affected process equipment in pounds/hour. This CMS shall be designed and operated to meet the requirements in USEPA's Performance Specification 6, "Specifications and Test Procedures for Continuous Emission Rate Monitoring Systems in Stationary Sources," 40 CFR Part 60, Appendix B, PS-6.
- c. For the monitoring systems required by Conditions 13(a) and (b):
  - i. In addition to automatically recording the data measured by each of these monitoring systems, the Permittee shall automatically record the emissions of ethylene oxide, in pounds/hour, as calculated from the data measured by these monitoring systems.

- ii. The Permittee shall operate and maintain these monitoring systems to comply with the requirements of 40 CFR 63.8(c) and (g), provided, however, that the Illinois EPA shall serve as the "Administrator" for purposes of these rules, rather than the Administrator of USEPA or his or her authorized representative.
  - d. The requirements of Conditions 13(a) through (c) shall not apply to the monitoring system(s) as needed to accommodate difficulties in the initial calibrations or certification of the monitoring system(s), e.g., difficulty in obtaining suitable calibration gases, or the relocation and recertification of these system(s), provided the Permittee notifies the Illinois EPA. For relocation of the monitor, this notification shall be provided in advance of the relocation of the system(s), including a description of the relocation (e.g., to a different location in the stack), the reason(s), and the expected duration of the period until the monitoring system(s) will be certified at their new location. For other difficulties this notification shall be provided as soon as practicable.
  - e. For the data that is automatically recorded by these continuous monitoring systems, the Permittee shall maintain a computer terminal at a location at the source so that authorized personnel or representatives of the Illinois EPA can readily view and evaluate the recorded data during the course of an on-site inspection.
14. Operational Monitoring and Instrumentation for the Affected Emission Control System
- a. For the scrubber, the Permittee shall calibrate, operate and maintain continuous monitoring systems for: 1) Scrubbant flow rate, and 2) pH of the scrubbant. Data collected by these monitoring devices shall be recorded on an hourly average and on a rolling 3-hour average, provided, however, that during a malfunction that prevents automatic recording of this data, data shall be recorded manually at least once per hour if the continuous emissions monitoring system required by Condition 13(a) is not in operation or recording valid data.
  - b. For the DBA device, the Permittee shall operate and maintain instrumentation to measure the temperatures before and after the heat exchanger for the inlet gas stream. This information shall be recorded at least twice during each operating day.
  - c. For the DBA device, the Permittee shall operate and maintain instrumentation to indicate the flow of gas to the individual pairs of beds, such as an indicator of the position of the damper (open or closed). This information shall be recorded whenever the Permittee changes the flow of gas to the pairs of beds in the device, e.g., one pair of beds is put into service in preparation for replacement of the sorbent in the other beds.
  - d. The Permittee shall keep a log or other records for the operation, calibration and maintenance of the monitoring systems and instrumentation required by Conditions 14(a) through (c) that includes information detailing all routine and non-routine maintenance performed and dates and duration of any outages.

15. Determinations of Emissions

- a. For the affected process equipment, the emissions of ethylene oxide during each hour shall be determined as follows:
  - i. During an hour in which the emission monitoring systems required by Conditions 13(a) and (b) are operating and providing valid data, the hourly emissions shall be the emissions measured by the monitoring systems.
  - ii. During an hour in which the emission monitoring system(s) required by Conditions 13(a) or (b) are not operating or are not providing valid data, the hourly emissions shall be a representative value for emissions as would be measured by the monitoring systems, as addressed in the records required by Condition 16(d), which values shall consider the level or nature of operation of the Alkoxylation Area, the operating data for scrubber in the affected emissions control system and the length of time since the sorbent in the active bed in the DBA device in the affected emissions control system was replaced.
  - iii. The Permittee shall maintain records for any calculations used in determining emissions during an hour and data upon which the calculations were based.
- b. After the initial compendium of emission values is completed, as required by Condition 16(d), the compilation of the emissions of the affected process equipment during each hour in a calendar quarter shall be completed within 20 days after the end of the calendar quarter.
- c. For purposes of the emission cap in Condition 3(a), the emissions of ethylene oxide from affected process equipment in a calendar year shall be calculated as the sum of the emissions in each hour, as addressed above, during that calendar year.

16. Recordkeeping

- a. The Permittee shall keep records for the reactors in the Alkoxylation Area for the number of batches started each day by the type or category of product.
- b. The Permittee shall maintain the following records for the DBA device in the affected emission control system:
  - i. A file containing information for:
    - A. The sorbent used in the device, including material name or trade name, manufacturer's name and manufacturer's data for ethylene oxide removal efficiency (percent) and absorption capacity (pounds ethylene oxide removed per pound of sorbent), with supporting documentation and/or calculations.
    - B. A copy of manufacturer's recommended operation and maintenance procedures for the device.



- C. A copy of the Permittee's operation and maintenance procedures for the device, including the procedures for disposal of spent sorbent, which procedures may incorporate the manufacturer's recommended procedures.
- ii. An operating log or other records that include:
    - A. The date and results of assessments conducted at least every 10 operating days for the performance of the active pair of beds for control of emissions, with the projected date by which the beds will need to be replaced by the inactive beds. These assessments shall be based on the expected loading of ethylene oxide to the DBA device considering the expected operation of the Alkoxylation Area for the next 10 days and the emissions of ethylene oxide measured by the monitoring systems required by Conditions 13(a) and (b) or, before such monitoring systems are certified, the concentration of ethylene oxide in the exhaust from the affected emission control system as measured by a portable monitoring instrument.
    - B. The dates that the operation of the DBA device is changed from one pair of beds to the other pair, with representative data for the monitored concentrations of ethylene oxide before and after the change.
    - C. The dates that the sorbent in a pair of beds is replaced, with confirmation that the DBA device continued in operation during replacement of the sorbent, as required by Condition 12(b).
    - D. Information identifying circumstances when the Permittee's operating and maintenance procedures were not followed, with description and information discussing the reason and the effect on emissions, if any.
  - iii. Records for the amount of sorbent added to the DBA device (pounds/quarter and pounds/year).
  - iv. Records for the amount of new sorbent for the DBA device in inventory at the source at the end of each quarter (pounds).
- c. The Permittee shall maintain an operating log or other records that identify periods when the affected emission control system was not in operation and confirm compliance with Condition 12(a).
  - d. The Permittee shall maintain a compendium of the values for hourly emission that it will use in lieu of monitored hourly emissions for different operational scenarios, as provided for by Condition 15(a)(ii), beginning 60 days after the monitoring systems required by Conditions 13(a) and (b) are certified. This compendium shall include an analysis demonstrating that it reasonably addresses the range of operating scenarios and the value for hourly emissions that will be used for each such

scenario, with the supporting operational and monitoring data and analysis upon which it is based.

17. Reporting Requirements

- a. The Permittee shall submit Progress Reports to the Illinois EPA on a monthly basis addressing progress toward installation and certification of the monitoring systems that are required by Conditions 13(a) and (b), continuing until the reports for the certification of these systems are submitted to the Illinois EPA. These reports shall address actions during each month. These reports shall be submitted by the 15<sup>th</sup> day of the following month.
- b. In the quarterly reports required by Condition 7, the Permittee shall provide information describing changes to the monitoring systems that are required by Conditions 13(a) and (b), if any, to improve the limit of quantification of these systems, including a description of the changes, the rationale for the changes, a description of the expected and actual result of the changes, and confirmation that the changes did not negatively affect the performance of the monitoring systems.
- c. For affected process equipment, the timing for the notifications for deviation(s) from the requirements of this construction permit, as required by Condition 7(b), shall be as follows:
  - i. Notifications for the following deviations shall be submitted within 5 days:
    - A. Deviations involving the operational requirements of Condition 12(a) or (b).
    - B. Deviations involving the timing of required emission calculations.
  - ii. Notifications for other deviations shall be submitted with the quarterly report.

Part 3: Permit Conditions for "Affected Components"18. Introduction

The "affected components" are the equipment at this source that emits or may emit fugitive emissions of ethylene oxide, including pumps, pressure relief devices, valves, sampling connections, flanges or other connectors, compressors (if any), and closed vent systems. The emissions of the affected components are addressed by implementation of a Leak Detection and Repair (LDAR) Program. This program entails monitoring of the individual components to measure the concentration of ethylene oxide around the surface of the component. This monitoring is generally conducted in periodic "campaigns" in which monitoring is conducted for the various subject components at the facility. When the monitoring for a particular component measures an elevated level of ethylene oxide, which represents a leak, timely repairs must be made to the component to eliminate the leak.

19. Implementation of an Enhanced LDAR Program

- a. For affected components, the Permittee shall implement a Leak Detection and Repair (LDAR) Program that includes the following enhancements and features compared to the LDAR program that is required to be implemented for the components in the Alkoxylation Area "process unit" pursuant to the NSPS, 40 CFR 60 Subpart VVa, for components that are in VOC service:
  - i. The program shall address components that are "in ethylene oxide service," including any such components that are not also in volatile organic compound service as defined in 40 CFR 60.481a. For this purpose, "in ethylene oxide service" shall be defined to include any piece of equipment that contains or contacts a process fluid that is at least 1.0 percent ethylene oxide by weight.
  - ii. A list of the identification numbers of components in ethylene oxide service shall be maintained or other method used so that components in ethylene oxide service may be distinguished from other components addressed in the recordkeeping that is part of the LDAR program required by 40 CFR 60 Subpart VVa and information for these components can be separately retrieved, compiled and reviewed.
  - iii. Under the enhanced program, monitoring of components required to be conducted on a quarterly basis under 40 CFR 60 Subpart VVa shall be conducted on at least a monthly basis for components in ethylene oxide service, with such monitoring separated by at least 15 days.
  - iv. The frequency or extent of monitoring for components in ethylene oxide service that are "unsafe-to-monitor" or that would be "difficult-to-monitor" (i.e., require elevation of monitoring personnel more than 2 meters above a support surface), if any, shall not be reduced or be less frequent than monitoring that is conducted for other otherwise similar components.
  - v. The frequency of monitoring for components in ethylene oxide service shall not be reduced based on fulfillment of the

criteria for and the designation of components for "no detectable emissions."

- vi. The instrument that is used to monitor components in ethylene oxide service shall have multiple scales with digital readout, with the bottom scale calibrated to measure a lower concentration of no more than 0.1 ppm.
  - vii. The instrument readings that are recorded when components in ethylene oxide service are monitored shall include concentration values recorded to the nearest tenth of a ppm or at least two significant digits, whichever is greater.
  - viii. For components in ethylene oxide service, if instrument readings that are below the detection limit of the monitoring instrument are entered as zero or the detection limit of the instrument in the records for LDAR monitoring, such records shall be accompanied by explanatory information noting that such values indicate readings that were below the detection limit of the instrument.
  - ix. The instrument reading that defines a leaking component for components in ethylene oxide service shall be a concentration of no more than 50 ppm, adjusted for the response factor for ethylene oxide.
- b. The affected facility shall not have any open-ended valves or lines in ethylene oxide service.

20. Determinations of Emissions

- a. After each periodic monitoring campaign for the affected components is conducted, the total emissions of ethylene oxide from the components during the period since the previous campaign shall be calculated as follows:
  - i. The emissions shall be calculated using the correlation approach for determining emissions from components at sources in the Synthetic Organic Compound Manufacturing Industry (SOCMI) set forth in USEPA's *Protocol for Equipment Leak Emission Estimates*, USEPA, Office of Air Quality Planning and Standard, EPA-453/R-95-017, or the latest version of or successor to this document, unless otherwise provided in a subsequent permit issued by the Illinois EPA.
  - ii. The emissions shall be calculated from the data collected for affected components in the periodic monitoring campaign and the previous monitoring campaign, including the measured concentrations for individual components, and from the data collected for any components in "non-periodic monitoring" conducted between the monitoring campaigns, such as component-specific monitoring to address the effectiveness of repairs to or preventative maintenance for particular components.
  - iii. The calculations of emissions for each monitoring campaign shall be completed within 30 days after completing the campaign.

- iv. The Permittee shall maintain records for the calculations of emissions from the affected components and the data upon which these calculations were based.
- b. For purposes of the emission cap in Condition 3(a), the emissions of ethylene oxide from affected components during a calendar year shall be calculated from the data for emissions for individual monitoring campaigns as addressed above, using the formula in Attachment 1.

21. Recordkeeping for Affected Components

- a. For the enhanced LDAR program for affected components required by Condition 19(a), the Permittee shall keep following records:
  - i. The records required by 40 CFR 60 Subpart VVa.
  - ii. Records for the implementation of this program that address the various elements for an enhanced LDAR program set forth in Condition 19(a).
  - iii. A log or other records addressing deviations from the requirements for this program, including a description of each deviation, the number and types of components that were affected by the deviation, the implications of the effectiveness of the LDAR program and other information required to be reported for a deviation pursuant to Condition 7(b).
- b. For the records of data that is electronically recorded for the affected components, such as the records of data collected during monitoring campaigns, the Permittee shall maintain a computer terminal at a location at the source so that authorized personnel or representatives of the Illinois EPA can readily view and evaluate the recorded data during the course of an on-site inspection.

22. Reporting for the Affected Components

- a. In the quarterly reports required by Condition 7(a), the Permittee shall include the following information for each monitoring campaign for affected components completed during the quarter. To the extent that the specified information is not yet available (e.g., maintenance of components in response to the campaign is not completed), such information shall be reported in the subsequent quarterly report.
  - i. General information for each monitoring campaign, including 1) Responsible entity; 2) Start and end dates; 3) Number of monitoring personnel; 4) Total number of components in the affected facility; 5) Number of components monitored; and 6) Numbers of components, by the applicable reason (e.g., not in operation or not in ethylene oxide service at the time of the campaign), that were not monitored.
  - ii. Summary information for components that were not leaking for which maintenance was initiated as a result of the monitoring, including the numbers of components, by the type of component, for which maintenance was performed.

- iii. Detailed information for each leaking component that was identified in the monitoring campaign, including: 1) Component Identifier; 2) Type of component; 3) Dates and times when the initial repair was completed and follow-up monitoring was conducted; 4) If further repairs were needed, dates and times when final repairs were completed and follow-up monitoring conducted, and 5) A description of the repair(s) that were completed for the component.
  
- b. For affected components, the timing for the notifications for deviation(s) from the requirements of this construction permit, as required by Condition 7(b), shall be as follows:
  - iii. Notifications for any of the following deviations shall be submitted within five days:
    - A. Deviations involving the timing of a required monitoring campaign.
  
    - B. Deviations involving the timing of required calculations of emissions for an individual monitoring campaign.
  
  - iii. Notifications for other deviations shall be submitted with the quarterly report.

## ATTACHMENT 1:

DETERMINATION OF THE ANNUAL EMISSIONS OF ETHYLENE OXIDE FROM COMPONENTS

The mass of emissions of ethylene oxide from affected components for a calendar year shall be determined in accordance with the following formula.

$$\text{Emissions} = E_1(F_1) + \sum_{i=2}^n E_i + E_{n+1}(F_{n+1})$$

Where:

$E_1$  = The mass of emissions of ethylene oxide as determined from the initial monitoring of components conducted in January of the calendar year, which determination is also based on the data from the monitoring of components conducted in December of the preceding year.

$E_i$  = The determinations of the mass of emissions of ethylene oxide from components during the calendar year, inclusive, which determinations are based on only the data from monitoring of components conducted during the calendar year. For example, with monitoring conducted on a monthly basis, the summation would address 11 determinations of emissions ( $n = 11$ ). The first determination of emissions ( $E_3$ ) would address the emissions of the period between monitoring conducted in January and in February. The last determination of emissions ( $E_n$ ) would address emissions for the period between the monitoring conducted in November and in December.

$E_{n+1}$  = The mass of emissions of ethylene oxide as determined from the initial monitoring of components conducted in January of the subsequent calendar year, which determination is also based on the monitoring data from the monitoring of components conducted in December of the calendar year.

$F_1$  = The ratio of the number of days in the calendar year until monitoring was first conducted for components in the calendar year and the total number of days between the date that monitoring was last conducted in the previous year and the date that monitoring was first conducted in the calendar year. For example, if monitoring of components was conducted on the 20<sup>th</sup> day in both January of the current year and December of the previous year,  $F_1$  would be 20/31 or 0.645 (20 days in the calendar year divided by 31 days between the monitoring conducted in December and January).

$F_{n+1}$  = The ratio of the number of days in the calendar year after the date that monitoring was last conducted for components in the calendar year and the total number of days between that date and the date that monitoring was first conducted in the subsequent calendar year. For example, if monitoring of components was conducted on the 15<sup>th</sup> day in both December of the current year and January of the subsequent year,  $F_{n+1}$  would be 16/31 or 0.516 (16 days in the calendar year divided by 31 days between the monitoring conducted in December and January).



STATE OF ILLINOIS  
ENVIRONMENTAL PROTECTION AGENCY  
DIVISION OF AIR POLLUTION CONTROL  
P. O. BOX 19506  
SPRINGFIELD, ILLINOIS 62794-9506

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

July 1, 1985

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 Agency and a supplemental written permit issued.
4. The Permittee shall allow any duly authorized agent of the Agency 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 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 emission 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 the 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 Agency (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.
- 6.
- a. Unless a joint construction/operation permit has been issued, a permit for operation shall be obtained from the Agency 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 Agency 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 statements 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.