

**CONSTRUCTION PERMIT
OFFICE OF AIR MANAGEMENT**

**Koch Industries, Inc.
7438 East C.R. 800 South
Walton, Indiana 46994**

is hereby authorized to construct an ammonia terminal including the following equipment:

- (a) two (2) ammonia heaters designated H-1 and H-2 having maximum heat input rates of 15 million British thermal units per hour and 22.9 million British thermal units per hour, respectively. Both heaters are fired by natural gas.
- (b) eight (8) vaporizer units designated V-1 through V-8 each having a maximum heat input rate of 0.08 million British thermal units per hour fired by natural gas.
- (c) two (2) emergency ammonia flares designated as F-1 and F-2, both piloted by natural gas and each having a maximum heat input rate of 1.14 million British thermal units per hour.

This permit is issued to the above mentioned company (herein known as the Permittee) under the provisions of 326 IAC 2-1 and 40 CFR 52.780, with conditions listed on the attached pages.

Construction Permit No.: CP-017-8982-00042	
Issued by: Paul Dubenetzky, Branch Chief Office of Air Management	Issuance Date:

Construction Conditions

General Construction Conditions

1. That the data and information supplied with the application shall be considered part of this permit. Prior to any proposed change in construction which may affect allowable emissions, the change must be approved by the Office of Air Management (OAM).
2. That this permit to construct does not relieve the permittee of the responsibility to comply with the provisions of the Indiana Environmental Management Law (IC 13-11 through 13-20; 13-22 through 13-25; and 13-30), the Air Pollution Control Law (IC 13-17) and the rules promulgated thereunder, as well as other applicable local, state, and federal requirements.

Effective Date of the Permit

3. That pursuant to IC 13-15-5-3, this permit becomes effective upon its issuance.
4. That pursuant to 326 IAC 2-1-9(b)(Revocation of Permits), the Commissioner may revoke this permit if construction is not commenced within eighteen (18) months after receipt of this approval or if construction is suspended for a continuous period of one (1) year or more.
5. That notwithstanding Construction Condition No. 6, all requirements and conditions of this construction permit shall remain in effect unless modified in a manner consistent with procedures established for modifications of construction permits pursuant to 326 IAC 2 (Permit Review Rules).

First Time Operation Permit

6. That this document shall also become a first-time operation permit pursuant to 326 IAC 2-1-4 (Operating Permits) when, prior to start of operation, the following requirements are met:
 - (a) The attached affidavit of construction shall be submitted to the Office of Air Management (OAM), Permit Administration & Development Section, verifying that the facilities were constructed as proposed in the application. The facilities covered in the Construction Permit may begin operating on the date the Affidavit of Construction is postmarked or hand delivered to IDEM.
 - (b) If construction is completed in phases; i.e., the entire construction is not done continuously, a separate affidavit must be submitted for each phase of construction. Any permit conditions associated with operation start up dates such as stack testing for New Source Performance Standards (NSPS) shall be applicable to each individual phase.
 - (c) Permittee shall receive an Operation Permit Validation Letter from the Chief of the Permit Administration & Development Section and attach it to this document.
 - (d) The operation permit will be subject to annual operating permit fees pursuant to 326 IAC 2-1-7.1(Fees).

- (e) Pursuant to 326 IAC 2-1-4, the Permittee shall apply for an operation permit renewal at least ninety (90) days prior to the expiration date established in the validation letter. The operation permit issued shall contain as a minimum the conditions in the Operation Conditions section of this permit.
7. That when the facility is constructed and placed into operation the following operation conditions shall be met:

Operation Conditions

General Operation Conditions

1. That the data and information supplied in the application shall be considered part of this permit. Prior to any change in the operation which may result in an increase in allowable emissions exceeding those specified in 326 IAC 2-1-1 (Construction and Operating Permit Requirements), the change must be approved by the Office of Air Management (OAM).
2. That the permittee shall comply with the provisions of the Indiana Environmental Management Law (IC 13-11 through 13-20; 13-22 through 13-25; and 13-30), the Air Pollution Control Law (IC 13-17) and the rules promulgated thereunder.

Preventive Maintenance Plan

3. That pursuant to 326 IAC 1-6-3 (Preventive Maintenance Plans), the Permittee shall prepare and maintain a preventive maintenance plan, including the following information:
- (a) Identification of the individual(s) responsible for inspecting, maintaining, and repairing emission control devices.
- (b) A description of the items or conditions that will be inspected and the inspection schedule for said items or conditions.
- (c) Identification of the replacement parts which will be maintained in inventory for quick replacement.

The preventive maintenance plan shall be submitted to IDEM, OAM upon request and shall be subject to review and approval.

Transfer of Permit

4. That pursuant to 326 IAC 2-1-6 (Transfer of Permits):
- (a) In the event that ownership of this ammonia terminal is changed, the Permittee shall notify OAM, Permit Branch, within thirty (30) days of the change. Notification shall include the date or proposed date of said change.
- (b) The written notification shall be sufficient to transfer the permit from the current owner to the new owner.
- (c) The OAM shall reserve the right to issue a new permit.

Permit Revocation

5. That pursuant to 326 IAC 2-1-9(a)(Revocation of Permits), this permit to construct and operate may be revoked for any of the following causes:
- (a) Violation of any conditions of this permit.
 - (b) Failure to disclose all the relevant facts, or misrepresentation in obtaining this permit.
 - (c) Changes in regulatory requirements that mandate either a temporary or permanent reduction of discharge of contaminants. However, the amendment of appropriate sections of this permit shall not require revocation of this permit.
 - (d) Noncompliance with orders issued pursuant to 326 IAC 1-5 (Episode Alert Levels) to reduce emissions during an air pollution episode.
 - (e) For any cause which establishes in the judgment of IDEM, the fact that continuance of this permit is not consistent with purposes of 326 IAC 2-1 (Permit Review Rules).

Availability of Permit

6. That pursuant to 326 IAC 2-1-3(l), the Permittee shall maintain the applicable permit on the premises of this source and shall make this permit available for inspection by the IDEM, (local agency if applicable) or other public official having jurisdiction.

Malfunction Condition

7. That pursuant to 326 IAC 1-6-2 (Records; Notice of Malfunction):
- (a) A record of all malfunctions, including startups or shutdowns of any facility or emission control equipment, which result in violations of applicable air pollution control regulations or applicable emission limitations shall be kept and retained for a period of three (3) years and shall be made available to the Indiana Department of Environmental Management (IDEM), Office of Air Management (OAM) or appointed representative upon request.
 - (b) When a malfunction of any facility or emission control equipment occurs which lasts more than one (1) hour, said condition shall be reported to OAM, using the Malfunction Report Forms (2 pages). Notification shall be made by telephone or facsimile, as soon as practicable, but in no event later than four (4) daytime business hours after the beginning of said occurrence.
 - (c) Failure to report a malfunction of any emission control equipment shall constitute a violation of 326 IAC 1-6, and any other applicable rules. Information of the scope and expected duration of the malfunction shall be provided, including the items specified in 326 IAC 1-6-2(a)(1) through (6).
 - (d) Malfunction is defined as any sudden, unavoidable failure of any air pollution control equipment, process, or combustion or process equipment to operate in a normal and usual manner. [326 IAC 1-2-39]

Opacity Limitations

8. That pursuant to 326 IAC 5-1-2 (Visible Emission Limitations) except as provided in 326 IAC 5-1-3 (Temporary Exemptions), the visible emissions shall meet the following:

- (a) visible emissions shall not exceed an average of 40% opacity in 24 consecutive readings.
- (b) visible emissions shall not exceed 60% opacity for more than a cumulative total of 15 minutes (60 readings) in a 6-hour period.

Fugitive Dust Emissions

- 9. That pursuant to 326 IAC 6-4 (Fugitive Dust Emissions), the permittee shall be in violation of 326 IAC 6-4 (Fugitive Dust Emissions) if any of the criteria specified in 326 IAC 6-4-2(1) through (4) are violated. Observations of visible emissions crossing the property line of the source at or near ground level must be made by a qualified representative of IDEM. [326 IAC 6-4-5(c)].

Open Burning

- 10. That the permittee shall not open burn any material except as provided in 326 IAC 4-1-3, 326 IAC 4-1-4 or 326 IAC 4-1-6.

MALFUNCTION REPORT

**INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF AIR MANAGEMENT
FAX NUMBER - 317 233-5967**

**This form should only be used to report malfunctions applicable to Rule 326 IAC 1-6
and to qualify for the exemption under 326 IAC 1-6-4.**

THIS FACILITY MEETS THE APPLICABILITY REQUIREMENTS BECAUSE: IT HAS POTENTIAL TO EMIT 25 LBS/HR PARTICULATES ?____, 100 LBS/HR VOC ?____, 100 LBS/HR SULFUR DIOXIDE ?____ OR 2000 LBS/HR OF ANY OTHER POLLUTANT ?____ EMISSIONS FROM MALFUNCTIONING CONTROL EQUIPMENT OR PROCESS EQUIPMENT CAUSED EMISSIONS IN EXCESS OF APPLICABLE LIMITATION _____.

THIS MALFUNCTION RESULTED IN A VIOLATION OF: 326 IAC _____ OR, PERMIT CONDITION # _____ AND/OR PERMIT LIMIT OF _____

THIS INCIDENT MEETS THE DEFINITION OF 'MALFUNCTION' AS LISTED ON REVERSE SIDE ? Y N

THIS MALFUNCTION IS OR WILL BE LONGER THAN THE ONE (1) HOUR REPORTING REQUIREMENT ? Y N

COMPANY: _____ PHONE NO. () _____

LOCATION: (CITY AND COUNTY) _____

PERMIT NO. _____ AFS PLANT ID: _____ AFS POINT ID: _____ INSP: _____

CONTROL/PROCESS DEVICE WHICH MALFUNCTIONED AND REASON: _____

DATE/TIME MALFUNCTION STARTED: ____/____/19____ AM / PM

ESTIMATED HOURS OF OPERATION WITH MALFUNCTION CONDITION:

DATE/TIME CONTROL EQUIPMENT BACK-IN SERVICE ____/____/19____ AM/PM

TYPE OF POLLUTANTS EMITTED: TSP, PM-10, SO2, VOC, OTHER: _____

ESTIMATED AMOUNT OF POLLUTANT EMITTED DURING MALFUNCTION: _____

MEASURES TAKEN TO MINIMIZE EMISSIONS: _____

REASONS WHY FACILITY CANNOT BE SHUTDOWN DURING REPAIRS:

CONTINUED OPERATION REQUIRED TO PROVIDE ESSENTIAL* SERVICES: _____

CONTINUED OPERATION NECESSARY TO PREVENT INJURY TO PERSONS: _____

CONTINUED OPERATION NECESSARY TO PREVENT SEVERE DAMAGE TO EQUIPMENT: _____

INTERIM CONTROL MEASURES: (IF APPLICABLE) _____

MALFUNCTION REPORTED BY:

TITLE: _____
(SIGNATURE IF FAXED)

MALFUNCTION RECORDED BY: _____ DATE: _____ TIME: _____

PAGE 1 OF 2

Please note - This form should only be used to report malfunctions applicable to Rule 326 IAC 1-6 and to qualify for the exemption under 326 IAC 1-6-4.

326 IAC 1-6-1 Applicability of rule

Sec. 1. The requirements of this rule (326 IAC 1-6) shall apply to the owner or operator of any facility which has the potential to emit twenty-five (25) pounds per hour of particulates, one hundred (100) pounds per hour of volatile organic compounds or SO₂, or two thousand (2,000) pounds per hour of any other pollutant; or to the owner or operator of any facility with emission control equipment which suffers a malfunction that causes emissions in excess of the applicable limitation.

326 IAC 1-2-39 “Malfunction” definition

Sec. 39. Any sudden, unavoidable failure of any air pollution control equipment, process, or combustion or process equipment to operate in a normal and usual manner. (Air Pollution Control Board; 326 IAC 1-2-39; filed Mar 10, 1988, 1:20 p.m. : 11 IR 2373)

***Essential services** are interpreted to mean those operations, such as, the providing of electricity by power plants. Continued operation solely for the economic benefit of the owner or operator shall not be sufficient reason why a facility cannot be shutdown during a control equipment shutdown.

If this item is checked on the front, please explain rationale:

Indiana Department of Environmental Management Office of Air Management

Technical Support Document (TSD) for New Construction and Operation

Source Background and Description

Source Name: Koch Industries, Inc.
 Source Location: 7438 East C.R. 800 South, Walton, Indiana 46994
 County: Cass
 Construction Permit No.: CP-017-8982-00042
 SIC Code: 4226
 Permit Reviewer: Janusz Johnson

The Office of Air Management (OAM) has reviewed an application from Koch Industries, Inc., relating to the construction and operation of an ammonia terminal including the following equipment:

- (a) two (2) ammonia heaters designated H-1 and H-2 having maximum heat input rates of 15 million British thermal units per hour and 22.9 million British thermal units per hour, respectively. Both heaters are fired by natural gas.
- (b) eight (8) vaporizer units designated V-1 through V-8 each having a maximum heat input rate of 0.08 million British thermal units per hour fired by natural gas.
- (c) two (2) emergency ammonia flares designated as F-1 and F-2, both piloted by natural gas and each having a maximum heat input rate of 1.14 million British thermal units per hour.

Stack Summary

Stack ID	Operation	Height (feet)	Diameter (feet)	Flow Rate (acfm)	Temperature (°F)
H1	heater H-1	28	1.7	6000	800
H2	heater H-2	28	1.5	8500	800
F1	flare F-1	80	0.3	25.4	1200
F2	flare F-2	80	0.5	25.4	1200

Enforcement Issue

IDEM is aware that the heaters, vaporizers, and flares listed above have been constructed and operated prior to receipt of the proper permit. IDEM is reviewing this matter and will take appropriate action. This proposed permit is intended to satisfy the requirements of the construction permit rules.

Recommendation

The staff recommends to the Commissioner that the construction and operation be approved. This recommendation is based on the following facts and conditions:

Information, unless otherwise stated, used in this review was derived from the application and additional information submitted by the applicant.

An application for the purposes of this review was received on September 12, 1997, with additional information received on October 23, 1997.

Emissions Calculations

See Appendix A (Emissions Calculation Spreadsheets) for detailed calculations (5 pages).

Total Potential and Allowable Emissions

Indiana Permit Allowable Emissions Definition (after compliance with applicable rules, based on 8,760 hours of operation per year at rated capacity):

Pollutant	Allowable Emissions (tons/year)	Potential Emissions (tons/year)
Particulate Matter (PM)	79.2	79.2
Particulate Matter (PM10)	30.3	30.3
Sulfur Dioxide (SO ₂)	0.1	0.1
Volatile Organic Compounds (VOC)	1.4	1.4
Carbon Monoxide (CO)	9.6	9.6
Nitrogen Oxides (NO _x)	24.2	24.2
Single Hazardous Air Pollutant (HAP)	0	0
Combination of HAPs	0	0

- (a) Allowable emissions (as defined in the Indiana Rule) of particulate matter (PM) are greater than 25 tons per year. Therefore, pursuant to 326 IAC 2-1, Sections 1 and 3, a construction permit is required.

County Attainment Status

- (a) Volatile organic compounds (VOC) and oxides of nitrogen are precursors for the formation of ozone. Therefore, VOC and NO_x emissions are considered when evaluating the rule applicability relating to the ozone standards. Cass County has been designated as attainment or unclassifiable for ozone. Therefore, VOC and NO_x emissions were reviewed pursuant to the requirements for Prevention of Significant Deterioration (PSD), 326 IAC 2-2 and 40 CFR 52.21.
- (b) Cass County has been classified as attainment or unclassifiable for all other regulated air pollutants. Therefore, these emissions were reviewed pursuant to the requirements for Prevention of Significant Deterioration (PSD), 326 IAC 2-2 and 40 CFR 52.21.
- (c) Fugitive Emissions

Since this type of operation is not one of the 28 listed source categories under 326 IAC 2-2 and since there are no applicable New Source Performance Standards that were in effect on August 7, 1980, the fugitive PM emissions are not counted toward determination of PSD and Emission Offset applicability.

Source Status

New Source PSD Definition (emissions after controls, based on 8,760 hours of operation per year at rated capacity and/ or as otherwise limited):

Pollutant	Emissions (ton/yr)
PM	2.8
PM10	2.8
SO ₂	0.1
VOC	1.4
CO	9.6
NO _x	24.2
Single HAP	0.0
Combination HAPs	0.0

- (a) This new source is **not** a major stationary source because no attainment pollutant is emitted at a rate of 250 tons per year or greater and it is not in one of the 28 listed source categories. Therefore, pursuant to 326 IAC 2-2, and 40 CFR 52.21, the PSD requirements do not apply.

Part 70 Permit Determination

326 IAC 2-7 (Part 70 Permit Program)

This new source is not subject to the Part 70 Permit requirements because the potential to emit (PTE) of:

- (a) each criteria pollutant is less than 100 tons per year,
- (b) a single hazardous air pollutant (HAP) is less than 10 tons per year, and
- (c) any combination of HAPs is less than 25 tons/year.

This is the first air approval issued to this source.

Federal Rule Applicability

There are no New Source Performance Standards (326 IAC 12), 40 CFR Part 60, applicable to these facilities. 40 CFR Part 60.40c, Subpart Dc (Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units) does not apply because the two (2) ammonia heaters were constructed prior to June 9, 1989 and are not steam generators.

There are no National Emissions Standards for Hazardous Air Pollutants, 40 CFR Part 63, applicable to these facilities.

State Rule Applicability

326 IAC 5-1-2 (Visible Emission Limitations)

That pursuant to 326 IAC 5-1-2 except as provided in 326 IAC 5-1-3 (Temporary Exemptions), the visible emissions shall meet the following:

- (a) visible emissions shall not exceed an average of 40% opacity in 24 consecutive readings.
- (b) visible emissions shall not exceed 60% opacity for more than a cumulative total of 15 minutes (60 readings) in a 6-hour period.

326 IAC 6-2 (Particulate Limitations for Sources of Indirect Heating)

This rule does not apply because the two (2) ammonia heaters heat the ammonia directly.

326 IAC 6-3 (Process Operations)

This rule does not apply because the particulate matter emissions at this source come from combustion facilities or are fugitive emissions from unpaved roads. There are no other facilities which emit particulate matter at this source.

326 IAC 6-4 (Fugitive Dust Emissions)

The Permittee shall be in violation of 326 IAC 6-4 if any of the criteria specified in 326 IAC 6-4-2(1) through (4) are violated. Observations of visible emissions crossing the property line of the source at or near ground level must be made by a qualified representative of IDEM.

Air Toxic Emissions

Indiana presently requests applicants to provide information on emissions of the 187 hazardous air pollutants set out in the Clean Air Act Amendments of 1990. These pollutants are either carcinogenic or otherwise considered toxic and are commonly used by industries. They are listed as air toxics on the Office of Air Management (OAM) Construction Permit Application Form Y. None of these listed air toxics will be emitted from this proposed construction.

Conclusion

The construction of this ammonia terminal will be subject to the conditions of the attached proposed **Construction Permit No. CP-017-8982-00042**.

**Appendix A: Emissions Calculations
FLARE EMISSIONS**

Company Name: Koch Industries, Inc.
City, Indiana: Walton, IN
Reviewer: Janusz Johnson
Date: October 23, 1997

CP#: 017-8982
Plt ID: 017-00042

Heat Input Capacity MMBtu/hr	Effluent Rate scf/hr	Potential Throughput** MMCF/yr
2.28	969.60	26.63

(two flares, each with max heat input of 1.14 MMBtu/hr and exhaust of 25.4 acfm at 1200 deg F)

	Pollutant					
	PM*	PM10*	SO2	NOx	VOC	CO
Emission Factor in lb/MMBtu [ug/L]	177.00	177.00	0.00	0.07	0.09	0.37
Potential Emission in tons/yr	0.47	0.47	0.00	0.68	0.86	3.69

Methodology

Emission Factors from AP42 13.5 - Flare Emissions

* PM/PM10 emissions based on assumption that allowable opacity is 40% and this corresponds to "average smoking flares"
 $177 \text{ ug/L} * E_f \text{ (Effluent rate in scf/hr)} * 28.3165 \text{ L/scf} * g/10^6 \text{ ug} * \text{ton}/90718 \text{ g} * 8760 \text{ hr/yr} = \text{emissions (ton/yr)}$

** BASED ON 20% PILOT FUEL AND 80% AMMONIA

Potential Throughput (MMCF) = Heat Input Capacity (MMBtu/hr) x 8,760 hrs/yr x 1 MMCF/(0.2*2,314 MMBtu/MMCF + 0.8*359 MMBtu/MMCF)

MMBtu = 1,000,000 Btu

MMCF = 1,000,000 Cubic Feet of Gas

Emission (tons/yr) = Throughput (MMBtu/yr) x Emission Factor (lb/MMBtu)/2,000 lb/ton

10/797

**Appendix A: Emissions Calculations
Fugitive Emissions**

Company Name: Koch Industries, Inc.
City, Indiana: Walton, IN
Reviewer: Janusz Johnson
Date: October 23, 1997

CP#: 017-8982
Plt ID: 017-00042

Unpaved Road Fugitives

Plant Road Emissions:

$$E_f = k * 5.9 * (s/12) * (S/30) * (W/3)^{0.7} * (w/4)^{0.5} * (365 - p)/365$$

where: E_f is the emission factor
 k is particle size multiplier (assumed 1.0)
 s is silt content of road surface
 S is mean vehicle speed
 W is mean vehicle weight
 w is mean number of vehicle wheels
 p is number of days it rains > 0.01 inches (assumed 125)

$$E_p = (\text{trips/hr}) * (\text{miles/trip}) * 2 * E_f (\text{lbs/ton}) * 8760 (\text{hrs/yr}) * 0.0005 (\text{ton/lb})$$

Semi-Trucks

$$E_f = 1.0 * 5.9 * (5/12) * (10/30) * (13/3)^{0.7} * (20/4)^{0.5} * (365 - 125)/365$$

$E_f = 3.36 \text{ lbs/ton}$

$$E_p = 10.3 * 0.25 * 2 * 3.36 * 8760 * 0.0005$$

$E_p = 75.79 \text{ tons PM/yr}$

Pickups

$$E_f = 1.0 * 5.9 * (5/12) * (10/30) * (2/3)^{0.7} * (4/4)^{0.5} * (365 - 125)/365$$

$E_f = 0.41 \text{ lbs/ton}$

$$E_p = 0.083 * 0.25 * 2 * 3.36 * 8760 * 0.0005$$

$E_p = 0.61 \text{ tons PM/yr}$

Fugitive emissions from roads (tons/yr)	
PM	76.40
PM10 (36% PM)	27.50

**Appendix A: Existing Source
Natural Gas Combustion Only
Commercial Boiler (mm Btu/hr 0.3 - < 10)**

Company Name: Koch Industries, Inc.
City, Indiana: Walton, IN
Reviewer: Janusz Johnson
Date: October 23, 1997

CP#: 017-8982
Plt ID: 017-00042

Heat Input Capacity
MMBtu/hr

Potential Throughput
MMCF/yr

0.6 eight (8) 0.08 MMBtu/hr (V-1, 2, 3, 4, 5, 6, 7 & 8)

5.6

		Pollutant					
Emission Factor in lb/MMCF	**	PM 11.9	PM10 11.9	SO2 0.6	NOx 100.0	VOC 5.3	CO 21.0
Potential Emission in tons/yr		0.0	0.0	0.0	0.3	0.0	0.1

	Uncontrolled	Low NOx Burn	Flue Recirculation
**Emission Factor for NOx:	100	17	36
**Emission Factor for CO:	21	27	No Data

Methodology

MMBtu = 1,000,000 Btu

MMCF = 1,000,000 Cubic Feet of Gas

Potential Throughput (MMCF) = Heat Input Capacity (MMBtu/hr) x 8,760 hrs/yr x 1 MMCF/1,000 MMBtu

Emission Factors from AP42 1.4 - Natural Gas Combustion (EPA 450/4-90-003 SCC #1-03-006-03)

Emission (tons/yr) = Throughput (MMCF/yr) x Emission Factor (lb/MMCF)/2,000 lb/ton

**Appendix A: Emissions Calculations
Natural Gas Combustion Only
Small Industrial Boiler (10 < MM BTU/HR <100)**

Company Name: Koch Industries, Inc.
City, Indiana: Walton, IN
Reviewer: Janusz Johnson
Date: October 23, 1997

CP#: 017-8982
Plt ID: 017-00042

Heat Input Capacity
MMBtu/hr

Potential Throughput
MMCF/yr

37.9 15 MMBtu/hr (H-1), 22.9 MMBtu/hr (H-2)

332.0

Emission Factor in lb/MMCF **	Pollutant					
	PM	PM10	SO2	NOx	VOC	CO
	14.0	14.0	0.6	140.0	2.8	35.0
Potential Emission in tons/yr	2.3	2.3	0.1	23.2	0.5	5.8

	Uncontrolled	Low NOx Burn	Flue Recirculation
**Emission Factor for NOx:	140	79	30
**Emission Factor for CO:	35	61	37

Methodology

MMBtu = 1,000,000 Btu

MMCF = 1,000,000 Cubic Feet of Gas

Potential Throughput (MMCF) = Heat Input Capacity (MMBtu/hr) x 8,760 hrs/yr x 1 MMCF/1,000 MMBtu

Emission Factors are from AP 42, Chapter 1.4, EPA 450/4-90-003 SCC #1-02-006-02

Emission (tons/yr) = Throughput (MMCF/yr) x Emission Factor (lb/MMCF)/2,000 lb/ton

**Appendix A: Emissions Calculations
Emissions Summary**

Company Name: Koch Industries, Inc.
City, Indiana: Walton, IN
Reviewer: Janusz Johnson
Date: October 23, 1997

CP#: 017-8982
Plt ID: 017-00042

Worst Case Emissions (ton/yr)

Unit(s)	Heaters	Vaporizers	Flares	Fugitives	TOTAL	TOTAL LESS FUGITIVES
PM	2.30	0.00	0.47	76.40	79.17	2.77
PM10	2.30	0.00	0.47	27.50	30.27	2.77
SO2	0.10	0.00	0.00	0.00	0.10	0.10
NOx	23.20	0.30	0.68	0.00	24.18	24.18
VOC	0.50	0.00	0.86	0.00	1.36	1.36
CO	5.80	0.10	3.69	0.00	9.59	9.59