

**CONSTRUCTION PERMIT
OFFICE OF AIR MANAGEMENT**

**United States Gypsum Company
3501 Canal Street
East Chicago, Indiana 46312**

is hereby authorized to construct the equipment
listed on page 2 and 3 of this construction permit

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 089-8657-00333	
Issued by: Paul Dubenetzky, Branch Chief Office of Air Management	Issuance Date:

- (a) One (1) #2 dryer mill, equipped with a baghouse, known as MBH-10, exhausted through stack M-13.
- (b) One (1) #2 dryer mill air natural gas-fired heater rated at 20 million British thermal units per hour, known as M-12, exhausted through stack M-12.
- (c) One (1) #2 kettle burner consisting of six (6) natural gas-fired burners, each rated at 5 million British thermal units per hour, known as M-14, exhausted through stack M-14.
- (d) One (1) #2 kettle and one (1) #2 kettle feed bin, equipped with a baghouse, known as MBH-11, exhausted through stack M-16.
- (e) One (1) #2 hot pit, known as M-17, equipped with a baghouse, known as MBH-12.
- (f) One (1) board plant stucco storage bin, one (1) surge bin and one (1) hopper, known as B-11, equipped with a baghouse, known as BBH-11.
- (g) One (1) LP feed bin, known as B-12, equipped with a baghouse, known as BBH-12, exhausted through stack B-12.
- (h) One (1) HRA mill and one (1) HRA bin, equipped with a baghouse, known as BBH-14, exhausted through stack B-18.
- (i) One (1) stucco and dry additives baghouse, known as BBH-13, exhausted through stack B-13.
- (j) Two (2) additive storage bin vacuum receivers, known as BVH1 and BVH2, each equipped with a baghouse, exhausted through stacks B-14 and B-15.
- (k) Four (4) additive storage bins, two (2) feed hoppers and two (2) additive refill vacuum receivers, each equipped with a baghouse, exhausted through stack B-16 and B-17.
- (l) One (1) mixing conveyor.
- (m) One (1) end saw baghouse, known as BBH-15, exhausted through stack B-25.
- (n) One (1) miscellaneous baghouse, known as MBH-13, exhausted through stack M-18.
- (o) One (1) wet zone kiln natural gas-fired burner rated at 66 million British thermal units per hour, known as B-20, exhausted through stack B-20.
- (p) One (1) dry zone kiln natural gas-fired burner rated at 66 million British thermal units per hour, known as B-21, exhausted through stack B-21.
- (q) One (1) wet end seal natural gas-fired heater rated at 1.5 million British thermal units per hour, known as B-22, exhausted through stack B-22.
- (r) One (1) dry end seal natural gas-fired heater rated at 1.5 million British thermal units per hour, known as B-23, exhausted through stack B-23.

- (s) One (1) natural gas-fired paper heater rated at 2.2 million British thermal units per hour, known as B-26, exhausted through stack B-26.
- (t) One (1) natural gas-fired gauging water heat exchanger, rated at 3.5 million British thermal units per hour, known as B-27, exhausted through stack B-27.

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 2-7-19 (Fees).
 - (e) The Permittee has submitted their Part 70 (T-089-7532) application on December 12, 1996 for the existing source. The equipment being reviewed under this permit shall be incorporated in the submitted Part 70 application.
7. That when the facility is constructed and placed into operation the following operation conditions shall be met:

United States Gypsum Company
East Chicago, Indiana
Permit Reviewer: MES

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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 wallboard manufacturing source 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(I), the Permittee shall maintain the applicable permit on the premises of this source and shall make this permit available for inspection by the IDEM, or other public official having jurisdiction.

Performance Testing

- 7. That pursuant to 326 IAC 2-1-3 (Construction and Operating Permit Requirements) compliance stack tests shall be performed for all thirteen (13) baghouse exhausts for particulate matter and PM_{10} within 60 days after achieving maximum production rate, but no later than 180 days after initial start-up. These tests shall be performed according to 326 IAC 3-2.1 (Source Sampling Procedures) using the methods specified in the rule or as approved by the Commissioner.
 - (a) A test protocol shall be submitted to the OAM, Compliance Data Section, 35 days in advance of the test.
 - (b) The Compliance Data Section shall be notified of the actual test date at least two (2) weeks prior to the date.
 - (c) All test reports must be received by the Compliance Data Section within 45 days of completion of the testing.
 - (d) Whenever the results of the stack test performed exceed the level specified in this permit, appropriate corrective actions shall be implemented within thirty (30) days of receipt of the test results. These actions shall be implemented immediately unless notified by OAM that they are acceptable. The Permittee shall minimize emissions while the corrective actions are being implemented.
 - (e) Whenever the results of the stack test performed exceed the level specified in this permit, a second test to demonstrate compliance shall be performed within 120 days. Failure of the second test to demonstrate compliance may be grounds for immediate revocation of this permit to operate the affected facility.

Malfunction Condition

- 8. 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]

Annual Emission Reporting

9. That pursuant to 326 IAC 2-6 (Emission Reporting), the Permittee must annually submit an emission statement for the source. This statement must be received by April 15 of each year and must comply with the minimum requirements specified in 326 IAC 2-6-4. A copy of this rule is enclosed. The annual statement must be submitted to:

Indiana Department of Environmental Management
Technical Support and Modeling Section, Office of Air Management
100 North Senate Avenue, P. O. Box 6015
Indianapolis, Indiana 46206-6015

The annual emission statement covers the twelve (12) consecutive month time period starting December 1 and ending November 30.

Opacity Limitations

10. 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 20 percent opacity in 24 consecutive readings.
 - (b) visible emissions shall not exceed 60 percent opacity for more than a cumulative total of 15 minutes (60 readings) in a 6-hour period.

Particulate Matter Limitation

11. That pursuant to 326 IAC 6-1-2(a), particulate matter (PM) emissions from combustion facilities identified in the equipment list as items (o) through (t) shall be limited to 0.03 grains per dry standard cubic foot. Particulate matter (PM) emissions from process facilities shall be limited to the following:

Process Operation	Outlet Grain Loading (grains/dry standard cubic foot of outlet air)
#2 Dryer Mill (M-13)	0.010
#2 Kettle (M-16)	0.010
Board Plant Stucco (B-11)	0.008
#2 Hot Pit (M-17)	0.010
HRA L.P. Receiving (B-12)	0.008
Stucco/Additives Receiving (B-13)	0.008
Starch Bulk Bin (B-14)	0.008
Vermiculite Surge Bin (B-17)	0.008
Starch Surge Hopper (B-16)	0.008
Vermiculite Bulk Bin (B-15)	0.008
HRA Ball Mill (B-18)	0.010
End Saw (B-25)	0.008
Miscellaneous Mill (M-18)	0.008

Baghouse Operating Condition

12. That the thirteen (13) baghouses shall be operated at all times when the gypsum wallboard manufacturing processes are in operation.
- (a) The permittee shall take readings of the total static pressure drop across the baghouses, at least once per day. Unless operated under conditions for which the Preventive Maintenance Plan specifies otherwise, the pressure drop across the baghouses shall be maintained within the range of 2 and 8 inches of water. The Preventive Maintenance Plan for these baghouses shall contain troubleshooting contingency and corrective actions for when the pressure reading is outside of this range for any one reading.
 - (b) The instrument used for determining the pressure shall be subject to approval by IDEM, OAM, and shall be calibrated at least once every six (6) months.
 - (c) The gauge employed to take the pressure drop across the baghouses or any part of the facility shall have a scale such that the expected normal reading shall be no less than 20 percent of full scale and be accurate within ± 2 percent of full scale reading. The instrument shall be quality assured and maintained as specified by the vendor.
 - (d) An inspection shall be performed each calendar quarter of all the baghouses. Defective bags shall be replaced. A record shall be kept of the results of the inspection and the number of bags replaced.

- (e) In the event that a bag's failure has been observed:
 - (i) The affected compartments will be shut down immediately until the failed units have been replaced.
 - (ii) Based upon the findings of the inspection, any additional corrective actions will be devised within eight (8) hours of discovery and will include a timetable for completion.

Visible Emission Notations

13. That visible emission notations of all exhausts to the atmosphere from the thirteen baghouses shall be performed once per shift. A trained employee will record whether emissions are normal or abnormal.
- (a) For processes operated continuously, "normal" means those conditions prevailing, or expected to prevail, 80 percent of the time the process is in operation, not counting start up or shut down time.
 - (b) In the case of batch or discontinuous operation, readings shall be taken during that part of the operation specified in the facility's specific condition prescribing visible emissions.
 - (c) A trained employee is an employee who has worked at the plant at least one (1) month and has been trained in the appearance and characteristics of normal and abnormal visible emissions for that specific process.
 - (d) The Preventive Maintenance Plan for this facility shall contain troubleshooting contingency and corrective actions for when an abnormal emission is observed.

Fugitive Dust Emissions

14. 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

15. 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.

Emergency Reduction Plans

16. Pursuant to 326 IAC 1-5-2 (Emergency Reduction Plans; Submission):
- (a) The Permittee shall prepare written emergency reduction plans (ERPs) consistent with safe operating procedures.
 - (b) These ERPs shall be submitted for approval to:

Indiana Department of Environmental Management
Compliance Branch, Office of Air Management
100 North Senate Avenue, P.O. Box 6015
Indianapolis, Indiana 46206-6015

within 180 calendar days from the issuance date of this permit.

- (c) If the ERP is disapproved by IDEM, OAM (and local agency), the Permittee shall have an additional thirty (30) days to resolve the differences and submit an approvable ERP. If after this time, the Permittee does not submit an approvable ERP, IDEM, OAM (and local agency), shall supply such a plan.
- (d) These ERPs shall state those actions that will be taken, when each episode level is declared, to reduce or eliminate emissions of the appropriate air pollutants.
- (e) Said ERPs shall also identify the sources of air pollutants, the approximate amount of reduction of the pollutants, and a brief description of the manner in which the reduction will be achieved.
- (f) Upon direct notification by IDEM, OAM (and local agency), that a specific air pollution episode level is in effect, the Permittee shall immediately put into effect the actions stipulated in the approved ERP for the appropriate level. [326 IAC 1-5-3]

Facilities to be Removed

17. The following equipment shall be removed from service prior to the operation of the proposed equipment:

- (a) One (1) dry additives baghouse, known as BBH-1.
- (b) One (1) SB - Kerfing, baghouse, known as BBH-3.
- (c) One (1) panel saw baghouse, known as JBH-9.
- (d) One (1) HRA Landplaster bin baghouse, known as BBH-7.
- (e) One (1) HRA ball mill baghouse, known as BBH-8.
- (f) One (1) cut back saw baghouse, known as BBH-9
- (g) One (1) HRA bin (supply floor) baghouse, known as BBH-10.
- (h) One (1) natural gas-fired drying kiln wet end, known as B-4, rated at 28.0 million British thermal units per hour.
- (i) One (1) natural gas-fired drying kiln wet center, known as B-5, rated at 28.0 million British thermal units per hour.
- (j) One (1) natural gas-fired drying kiln dry center, known as B-6, rated at 12.0 million British thermal units per hour.
- (k) One (1) natural gas-fired drying kiln dry end, rated at 12.0 million British thermal units per hour.
- (l) One (1) natural gas-fired boiler, known as M-3, rated at 8.4 million British thermal units per hour.

- (m) One (1) natural gas-fired boiler, known as M-4, rated at 3.4 million British thermal units per hour.
- (n) One (1) natural gas-fired #1 kettle, known as M-5, rated at 15.0 million British thermal units per hour.
- (o) One (1) natural gas-fired rotary dryer, known as M-11, rated at 10.0 million British thermal units per hour.
- (p) Unpaved roads.

Natural Gas Throughput Limitations

18. The natural gas throughput to the following facilities shall be limited as specified below:

Combustion Facilities	Natural Gas Throughput (million cubic feet/month)
Dryer Mill (M-12)	14.6
Wet Zone Kiln Burner (B-20) Dry Zone Kiln Burner (B-21)	96.3 total
Gauging Water Heater (B-19) Six (6) Burners (M-14) Drying Kiln Wet Zone Seal (B-22) Drying Kiln Dry Zone Seal (B-23) Paper Heater (B-26)	28.2 total

Reporting Requirements

19. That a log of information necessary to document compliance with operation permit condition no. 18 shall be maintained. These records shall be kept for at least the past 36-month period and made available upon request to the Office of Air Management (OAM).

- (a) A quarterly summary shall be submitted to:

Indiana Department of Environmental Management
 Compliance Data Section, Office of Air Management
 100 North Senate Avenue, P.O. Box 6015
 Indianapolis, Indiana 46206-6015

and

IDEM/Northwest Indiana Office
 Gainer Bank Building
 504 North Broadway, Suite 418
 Gary, Indiana 46402-1921

within 30 days after the end of the quarter being reported in the format attached. These reports shall include the monthly throughput of natural gas.

United States Gypsum Company
East Chicago, Indiana
Permit Reviewer: MES

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- (b) Unless otherwise specified in this permit, any notice, report, or other submissions required by this permit shall be timely if:
 - (i) Delivered by U.S. mail and postmarked on or before the date it is due; or
 - (ii) Delivered by any other method if it is received and stamped by IDEM, OAM and Northwest Indiana Office, on or before the date it is due.
- (c) All instances of deviations from any requirements of this permit must be clearly identified in such reports.
- (d) Any corrective actions taken as a result of an exceedance of a limit, an excursion from the parametric values, or a malfunction that may have caused excess emissions must be clearly identified in such reports.
- (e) The first report shall cover the period commencing the postmarked submission date of the Affidavit of Construction.

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: United States Gypsum Company PHONE NO. 219 - 392 - 4600
LOCATION: (CITY AND COUNTY) East Chicago / Lake
PERMIT NO. 089-8657 AFS PLANT ID: 089-00333 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: _____

**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
Compliance Data Section**

Quarterly Report

Company Name: United States Gypsum Company
Location: 3501 Canal Street, East Chicago, Indiana 46312
Permit No.: 089-8657
Source: 089-00333
Pollutant: Nitrogen Oxides
Limit: Nitrogen oxides emissions of 72 tons per year equivalent to a natural gas throughput of 14.6 MMCF /month for M-12, 96.3 MMCF/month total for B-20 and B-21, and 28.2 MMCF/month total for B-19, M-14, B-22, B-23, and B-26.

Month: _____ Year: _____

Month	Natural Gas Throughput (million cubic feet)		
	M-12	B-20 & B-21	B-19, M-14, B-22, B-23 & B-26

Submitted by: _____
Title/Position: _____
Signature: _____
Date: _____

Indiana Department of Environmental Management Office of Air Management

Technical Support Document (TSD) for New Construction and Operation

Source Background and Description

Source Name: United States Gypsum Company
Source Location: 3501 Canal Street, East Chicago, Indiana 46312
County: Lake
Construction Permit No.: CP 089-8657-00333
SIC Code: 3275
Permit Reviewer: Mark L. Kramer

The Office of Air Management (OAM) has reviewed an application from United States Gypsum Company relating to the construction and operation of a modification to an existing permitted gypsum wallboard manufacturing source consisting of the following equipment:

- (a) One (1) #2 dryer mill, equipped with a baghouse, known as MBH-10, exhausted through stack M-13.
- (b) One (1) #2 dryer mill air natural gas-fired heater rated at 20 million British thermal units per hour, known as M-12, exhausted through stack M-12.
- (c) One (1) #2 kettle burner consisting of six (6) natural gas-fired burners, each rated at 5 million British thermal units per hour, known as M-14, exhausted through stack M-14.
- (d) One (1) #2 kettle and one (1) #2 kettle feed bin, equipped with a baghouse, known as MBH-11, exhausted through stack M-16.
- (e) One (1) #2 hot pit, known as M-17, equipped with a baghouse, known as MBH-12.
- (f) One (1) board plant stucco storage bin, one (1) surge bin and one (1) hopper, known as B-11, equipped with a baghouse, known as BBH-11.
- (g) One (1) LP feed bin, known as B-12, equipped with a baghouse, known as BBH-12, exhausted through stack B-12.
- (h) One (1) HRA mill and one (1) HRA bin, equipped with a baghouse, known as BBH-14, exhausted through stack B-18.
- (i) One (1) stucco and dry additives baghouse, known as BBH-13, exhausted through stack B-13.
- (j) Two (2) additive storage bin vacuum receivers, known as BVH1 and BVH2, each equipped with a baghouse, exhausted through stacks B-14 and B-15.

- (k) Four (4) additive storage bins, two (2) feed hoppers and two (2) additive refill vacuum receivers, each equipped with a baghouse, exhausted through stack B-16 and B-17.
- (l) One (1) mixing conveyor.
- (m) One (1) end saw baghouse, known as BBH-15, exhausted through stack B-25.
- (n) One (1) miscellaneous baghouse, known as MBH-13, exhausted through stack M-18.
- (o) One (1) wet zone kiln natural gas-fired burner rated at 66 million British thermal units per hour, known as B-20, exhausted through stack B-20.
- (p) One (1) dry zone kiln natural gas-fired burner rated at 66 million British thermal units per hour, known as B-21, exhausted through stack B-21.
- (q) One (1) wet zone kiln natural gas-fired burner rated at 1.5 million British thermal units per hour, known as B-22, exhausted through stack B-22.
- (r) One (1) dry zone kiln natural gas-fired burner rated at 1.5 million British thermal units per hour, known as B-23, exhausted through stack B-23.
- (s) One (1) natural gas-fired paper heater rated at 2.2 million British thermal units per hour, known as B-26, exhausted through stack B-26.
- (t) One (1) natural gas-fired gauging water heat exchanger, rated at 3.5 million British thermal units per hour, known as B-27, exhausted through stack B-27.

As a result of this modification, the following equipment will be taken out of service:

- (a) One (1) dry additives baghouse, known as BBH-1.
- (b) One (1) SB - Kerfing, baghouse, known as BBH-3.
- (c) One (1) panel saw baghouse, known as JBH-9.
- (d) One (1) HRA Landplaster bin baghouse, known as BBH-7.
- (e) One (1) HRA ball mill baghouse, known as BBH-8.
- (f) One (1) cut back saw baghouse, known as BBH-9.
- (g) One (1) HRA bin (supply floor) baghouse, known as BBH-10.
- (h) One (1) natural gas-fired drying kiln wet end, known as B-4, rated at 28.0 million British thermal units per hour.
- (i) One (1) natural gas-fired drying kiln wet center, known as B-5, rated at 28.0 million British thermal units per hour.

- (j) One (1) natural gas-fired drying kiln dry center, known as B-6, rated at 12.0 million British thermal units per hour.
- (k) One (1) natural gas-fired drying kiln dry end, rated at 12.0 million British thermal units per hour.
- (l) One (1) natural gas-fired boiler, known as M-3, rated at 8.4 million British thermal units per hour.
- (m) One (1) natural gas-fired boiler, known as M-4, rated at 3.4 million British thermal units per hour.
- (n) One (1) natural gas-fired boiler, #1 kettle known as M-5, rated at 15.0 million British thermal units per hour.
- (o) One (1) natural gas-fired rotary dryer, known as M-11, rated at 10.0 million British thermal units per hour.
- (p) Unpaved roads.

Stack Summary

Stack ID	Operation	Height (feet)	Diameter (feet)	Flow Rate (acfm)	Temperature (°F)
M13	#2 Dryer mill	118	3.06	22,000	220
M16	#2 Kettle	118	2.52	15,000	300
M17	#2 Hot pit	118	1.13	3,000	270
B11	Board plant stucco	58	1.30	4,000	160
B12	HRA L.P.	38	0.46	3,000	150
B13	Stucco/additives receiving	58	1.60	6,000	100
B14	Starch bulk bin	38	0.71	1,200	70
B15	Vermiculite bulk bin	38	0.71	1,200	70
B16	Starch surge hopper	43	0.50	600	70
B17	Vermiculite surge bin	43	0.50	600	70
B18	HRA ball mill	23	0.65	1,000	170
B25	End saw	28	2.76	18,000	70
M18	Miscellaneous mill	118	1.13	3,000	150

Enforcement Issue

There are no enforcement issues related to this source.

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 June 4, 1997, with additional information received on September 5 and 26, 1997 and October 8, 1997.

Emissions Calculations

See pages 1 through 7 of 7 of Appendix A (Emissions Calculation Spreadsheets) for detailed calculations.

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/yr)	Potential Emissions (tons/yr)
Particulate Matter (PM)	83.7	80,165
Particulate Matter (PM ₁₀)	80,165	80,165
Sulfur Dioxide (SO ₂)	0.501	0.501
Volatile Organic Compounds (VOC)	2.76	2.76
Carbon Monoxide (CO)	41.9	41.9
Nitrogen Oxides (NO _x)	72.0	72.0
Single Hazardous Air Pollutant (HAP)	0.00	0.00
Combination of HAPs	0.00	0.00

- (a) Allowable PM emissions are determined from the applicability of rule 326 IAC 6-1. See attached spreadsheets for detailed calculations, Appendix A, page 4 of 4.
- (b) The allowable PM emissions based on the rules cited are less than the potential emissions, therefore, the allowable emissions are used for the permitting determination.
- (c) Allowable emissions (as defined in the Indiana Rule) of particulate matter, carbon monoxide and nitrogen oxides 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. Lake County has been designated as severe nonattainment for ozone. Therefore, VOC and NO_x emissions were reviewed pursuant to the requirements for Emission Offset, 326 IAC 2-3.
- (b) Lake County has been classified as nonattainment for the remaining criteria pollutants. Therefore, these emissions were reviewed pursuant to the requirements for Emission Offset, 326 IAC 2-3.

Source Status

Existing Source PSD, Part 70 or FESOP Definition (emissions after controls, based on 8,760 hours of operation per year at rated capacity and/ or as otherwise limited):

Pollutant	Emissions (tons/yr)
PM	297
PM ₁₀	649
SO ₂	46.6
VOC	124
CO	1,551
NO _x	6,391

- (a) This existing source is a major stationary source because particulate matter, PM10, and CO are emitted at a rate of 100 tons per year or greater as well as VOC and NO_x are emitted at a rate of 25 tons per year or greater.
- (b) These emissions were based on Facility Quick Look Report, dated July 24, 1997.

Proposed Modification

PTE from the proposed modification (based on 8,760 hours of operation per year at rated capacity including enforceable emission control). Note that the contemporaneous decreases were calculated from the annual average of the actual emissions averaged over the past two (2) years for the equipment that is being taken out of service. These calculations were provided by the applicant and verified as shown on pages 6 and 7 of 7 of Appendix A..

Pollutant	PM (tons/yr)	PM₁₀ (tons/yr)	SO₂ (tons/yr)	VOC (tons/yr)	CO (tons/yr)	NO_x (tons/yr)
Proposed Modification	32.8	32.8	0.501	2.76	41.9	72.0
Contemporaneous Increases	0.00	0.00	0.00	0.00	0.00	0.00
Contemporaneous Decreases	19.2	19.2	0.220	1.19	11.9	48.6
Net Emissions	13.6	13.6	0.281	1.57	30.0	23.4
Offset Significant Level	25	15	40	40	100	40

This modification to an existing major stationary source is not major because the emissions increase is less than the Emission Offset significant levels. Therefore, pursuant to 326 IAC 2-3, the Emission Offset requirements do not apply.

In order to insure that the PM₁₀ emissions from the proposed modification do not exceed 32.8 tons per year from both combustion and process operations and the net emissions increase does not exceed 13.6 tons per year, the outlet grain loadings for the process operations will be limited to no more than the following:

Process Operation	Outlet Grain Loading (grains/dry standard cubic foot of outlet air)
#2 Dryer Mill (M-13)	0.010
#2 Kettle (M-16)	0.010
Board Plant Stucco (B-11)	0.008
#2 Hot Pit (M-17)	0.010
HRA L.P. Receiving (B-12)	0.008
Stucco/Additives Receiving (B-13)	0.008
Starch Bulk Bin (B-14)	0.008
Vermiculite Surge Bin (B-17)	0.008
Starch Surge Hopper (B-16)	0.008
Vermiculite Bulk Bin (B-15)	0.008
HRA Ball Mill (B-18)	0.010
End Saw (B-25)	0.008
Miscellaneous Mill (M-18)	0.008

In order to insure that the nitrogen oxide emissions from the proposed modification do not exceed 72.0 tons per year and the net emissions increase does not exceed 23.4 tons per year, the following natural gas throughput limitations are necessary:

Combustion Facilities	Natural Gas Throughput (million cubic feet/year)
Dryer Mill (M-12)	175
Wet Zone Kiln Burner (B-20) Dry Zone Kiln Burner (B-21)	1,156 total
Gauging Water Heater (B-19) Six (6) Burners (M-14) Drying Kiln Wet Zone Seal (B-22) Drying Kiln Dry Zone Seal (B-23) Paper Heater (B-26)	339 total

Part 70 Permit Determination

326 IAC 2-7 (Part 70 Permit Program)

This existing source has submitted their Part 70 (T-089-7532-00333) application on December 12, 1996. The equipment being reviewed under this permit shall be incorporated in the submitted Part 70 application.

Federal Rule Applicability

There are no New Source Performance Standards (326 IAC 12) and 40 CFR Part 63 applicable to this facility.

State Rule Applicability

326 IAC 2-6 (Emission Reporting)

These facilities are subject to 326 IAC 2-6 (Emission Reporting), because the source has the potential to emit more than 10 tons per year of NO_x in Lake County. Pursuant to this rule, the owner/operator of these facility must annually submit an emission statement of the facility. The annual statement must be received by April 15 of each year and must contain the minimum requirements as specified in 326 IAC 2-6-4.

326 IAC 6-1 (Nonattainment Area Particulate Limitations)

Since this source has potential particulate emissions greater than 100 tons per year and is located in Lake County, 326 IAC 6-1-2 (nonattainment area particulate limitations) is applicable. Pursuant to 326 IAC 6-1-2, particulate emissions from the PM generating facilities shall be limited to 0.03 grains per dry standard cubic foot. As shown on pages 1 - 3 of 7 of Appendix A all facilities, after controls, comply with this rule. In addition, the above grain loading limits assure compliance with this rule.

United States Gypsum Company
East Chicago, Indiana
Permit Reviewer: MES

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CP 089-8657
Plt ID 089-00333

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 these gypsum wallboard manufacturing facilities will be subject to the conditions of the attached proposed **Construction Permit No. CP 089-8657-00333**.

**Appendix A: Emission Calculations
Baghouse Operations**

Company Name: United States Gypsum Company
Address City IN Zip: 3501 Canal Street, East Chicago, Indiana 46312
CP: 089-8657
Pit ID: 089-00333
Reviewer: Mark L. Kramer
Date: June 4, 1997

Proposed New Equipment

Unit Description	Unit ID	Control Efficiency (%)	Grain Loading per Standard Cubic foot of Outlet Air (grains/std cub. ft.)	Gas or Air Flow Rate (scfm.)	Emission Rate before Controls (lb/hr)	Emission Rate before Controls (tons/yr)	Emission Rate after Controls (lb/hr)	Emission Rate after Controls (tons/yr)
#2 Dryer Mill	M-13	99.97%	0.010	17147	4899.1	21458.25	1.470	6.44
#2 kettle	M-16	99.97%	0.010	10461	2988.9	13091.19	0.897	3.93
Board Plant Stucco	B-11	99.97%	0.008	3419	781.5	3422.91	0.234	1.03
#2 hot pit	M-17	99.97%	0.010	2178	622.3	2725.61	0.187	0.818
HRAL.P. Receiving	B-12	99.97%	0.008	435	99.4	435.50	0.030	0.131
Stucco/additives receiving	B-13	99.97%	0.008	5678	1297.8	5684.49	0.389	1.71
Starch bulk bin	B-14	99.97%	0.008	1200	274.3	1201.37	0.082	0.360
Vermiculite surge bin	B-17	99.97%	0.008	600	137.1	600.69	0.041	0.180
Starch surge hopper	B-16	99.97%	0.008	600	137.1	600.69	0.041	0.180
Vermiculite bulk bin	B-15	99.97%	0.008	1200	274.3	1201.37	0.082	0.360
HRA ball mill	B-18	99.97%	0.010	841	240.3	1052.45	0.072	0.316
End Saw	B-25	99.97%	0.008	18000	4114.3	18020.57	1.234	5.41
Miscellaneous mill	M-18	99.97%	0.008	2606	595.7	2608.98	0.179	0.783

Total emissions	16462.11	72104.06	4.94	21.6
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Methodology

Emission Rate in lbs/hr (after controls) = (grains/cub. ft.) (sq. ft.) ((cub. ft./min.)/sq. ft.) (60 min/hr) (lb/7000 grains)

Emission Rate in tons/yr = (lbs/hr) (8760 hr/yr) (ton/2000 lb)

Emission Rate in lbs/hr (before controls) = Emission Rate (after controls): (lbs/hr)/(1-control efficiency)

Emission Rate in tons/yr = (lbs/hr) (8760 hr/yr) (ton/2000 lb)

Allowable Rate of Emissions

M-13
$$0.03 \frac{\text{grains}^*}{\text{dscf}} \times 17147.000 \text{ dscfm} \times \frac{1}{7000} \frac{\text{ton}}{\text{grains}} \times \frac{525600 \text{ minutes}^*}{\text{year}} \times \frac{1}{2000} \frac{\text{ton}}{\text{lbs}} = 19.3 \text{ tons/yr}$$

To meet 326 IAC 6-1, the following value must be < amount calculated above 6.44 tons/yr

M-16
$$0.03 \frac{\text{grains}^*}{\text{dscf}} \times 10461.000 \text{ dscfm} \times \frac{1}{7000} \frac{\text{ton}}{\text{grains}} \times \frac{525600 \text{ minutes}^*}{\text{year}} \times \frac{1}{2000} \frac{\text{ton}}{\text{lbs}} = 11.8 \text{ tons/yr}$$

To meet 326 IAC 6-1, the following value must be < amount calculated above 3.93 tons/yr

B-11

$$0.03 \frac{\text{grains} *}{\text{dscf}} \frac{3419.000 \text{ dscfm}}{1} = \frac{1 \text{ ton}}{2000 \text{ lbs}} = \frac{3.85 \text{ tons/yr}}{1}$$

525600 $\frac{\text{minutes} *}{\text{year}}$ $\frac{1}{7000 \text{ grains}}$ = $\frac{1 \text{ ton}}{2000 \text{ lbs}}$ = $\frac{3.85 \text{ tons/yr}}{1}$

To meet 326 IAC 6-1, the following value must be < amount calculated above 1.03 tons/yr

M-17

$$0.03 \frac{\text{grains} *}{\text{dscf}} \frac{2178.000 \text{ dscfm}}{1} = \frac{1 \text{ ton}}{2000 \text{ lbs}} = \frac{2.45 \text{ tons/yr}}{1}$$

525600 $\frac{\text{minutes} *}{\text{year}}$ $\frac{1}{7000 \text{ grains}}$ = $\frac{1 \text{ ton}}{2000 \text{ lbs}}$ = $\frac{2.45 \text{ tons/yr}}{1}$

To meet 326 IAC 6-1, the following value must be < amount calculated above 0.82 tons/yr

B-12

$$0.03 \frac{\text{grains} *}{\text{dscf}} \frac{435.000 \text{ dscfm}}{1} = \frac{1 \text{ ton}}{2000 \text{ lbs}} = \frac{0.49 \text{ tons/yr}}{1}$$

525600 $\frac{\text{minutes} *}{\text{year}}$ $\frac{1}{7000 \text{ grains}}$ = $\frac{1 \text{ ton}}{2000 \text{ lbs}}$ = $\frac{0.49 \text{ tons/yr}}{1}$

To meet 326 IAC 6-1, the following value must be < amount calculated above 0.13 tons/yr

B-13

$$0.03 \frac{\text{grains} *}{\text{dscf}} \frac{5678.000 \text{ dscfm}}{1} = \frac{1 \text{ ton}}{2000 \text{ lbs}} = \frac{6.40 \text{ tons/yr}}{1}$$

525600 $\frac{\text{minutes} *}{\text{year}}$ $\frac{1}{7000 \text{ grains}}$ = $\frac{1 \text{ ton}}{2000 \text{ lbs}}$ = $\frac{6.40 \text{ tons/yr}}{1}$

To meet 326 IAC 6-1, the following value must be < amount calculated above 1.71 tons/yr

B-14

$$0.03 \frac{\text{grains} *}{\text{dscf}} \frac{1200.000 \text{ dscfm}}{1} = \frac{1 \text{ ton}}{2000 \text{ lbs}} = \frac{1.35 \text{ tons/yr}}{1}$$

525600 $\frac{\text{minutes} *}{\text{year}}$ $\frac{1}{7000 \text{ grains}}$ = $\frac{1 \text{ ton}}{2000 \text{ lbs}}$ = $\frac{1.35 \text{ tons/yr}}{1}$

To meet 326 IAC 6-1, the following value must be < amount calculated above 0.36 tons/yr

B-17

$$0.03 \frac{\text{grains} *}{\text{dscf}} \frac{600.000 \text{ dscfm}}{1} = \frac{1 \text{ ton}}{2000 \text{ lbs}} = \frac{0.68 \text{ tons/yr}}{1}$$

525600 $\frac{\text{minutes} *}{\text{year}}$ $\frac{1}{7000 \text{ grains}}$ = $\frac{1 \text{ ton}}{2000 \text{ lbs}}$ = $\frac{0.68 \text{ tons/yr}}{1}$

To meet 326 IAC 6-1, the following value must be < amount calculated above 0.18 tons/yr

B-16
$$\frac{0.03 \text{ grains}^*}{\text{dsct}} \times \frac{600.000 \text{ dscfm}}{1} \times \frac{525600 \text{ minutes}^*}{\text{year}} \times \frac{1}{7000 \text{ grains}} \times \frac{1 \text{ ton}}{2000 \text{ lbs}} = \underline{\underline{0.68 \text{ tons/yr}}}$$

To meet 326 IAC 6-1, the following value must be < amount calculated above 0.18 tons/yr

B-15
$$\frac{0.03 \text{ grains}^*}{\text{dsct}} \times \frac{1200.000 \text{ dscfm}}{1} \times \frac{525600 \text{ minutes}^*}{\text{year}} \times \frac{1}{7000 \text{ grains}} \times \frac{1 \text{ ton}}{2000 \text{ lbs}} = \underline{\underline{1.35 \text{ tons/yr}}}$$

To meet 326 IAC 6-1, the following value must be < amount calculated above 0.36 tons/yr

B-18
$$\frac{0.03 \text{ grains}^*}{\text{dsct}} \times \frac{841.000 \text{ dscfm}}{1} \times \frac{525600 \text{ minutes}^*}{\text{year}} \times \frac{1}{7000 \text{ grains}} \times \frac{1 \text{ ton}}{2000 \text{ lbs}} = \underline{\underline{0.95 \text{ tons/yr}}}$$

To meet 326 IAC 6-1, the following value must be < amount calculated above 0.32 tons/yr

B-25
$$\frac{0.03 \text{ grains}^*}{\text{dsct}} \times \frac{18000.000 \text{ dscfm}}{1} \times \frac{525600 \text{ minutes}^*}{\text{year}} \times \frac{1}{7000 \text{ grains}} \times \frac{1 \text{ ton}}{2000 \text{ lbs}} = \underline{\underline{20.3 \text{ tons/yr}}}$$

To meet 326 IAC 6-1, the following value must be < amount calculated above 5.41 tons/yr

M-18
$$\frac{0.03 \text{ grains}^*}{\text{dsct}} \times \frac{2606.000 \text{ dscfm}}{1} \times \frac{525600 \text{ minutes}^*}{\text{year}} \times \frac{1}{7000 \text{ grains}} \times \frac{1 \text{ ton}}{2000 \text{ lbs}} = \underline{\underline{2.94 \text{ tons/yr}}}$$

To meet 326 IAC 6-1, the following value must be < amount calculated above 0.78 tons/yr

**Appendix A: Emission Calculations
Baghouse Operations**

Company Name: United States Gypsum Company
Address City IN Zip: 3501 Canal Street, East Chicago, Indiana 46312
CP: 089-8657
Plt ID: 089-00333
Reviewer: Mark L. Kramer
Date: June 4, 1997

**Equipment to Be Removed
Actual Emissions**

Unit Description	Unit ID	Grain Loading per Standard Cubic foot of Outlet Air (grains/scf)	Gas or Air Flow Rate (scfm.)	Emission Rate after Controls (lb/hr)	Actual # of Hours per Year	Emission Rate after Controls (tons/yr)
Dry Additives	BBH-1	0.020	13000	2.229	7502.000	8.359
SB - Kerfing	BBH-3	0.020	1500	0.257	1436.000	0.185
Panel Saw	JBH-9	0.020	5000	0.857	7502.000	3.215
HRA Landplaster Bin	BBH-7	0.020	600	0.103	7502.000	0.386
HRA Ball Mill	BBH-8	0.020	600	0.103	7502.000	0.386
Cutback Saw	BBH-9	0.020	600	0.103	7502.000	0.386
HRA Bin (Supply Floor)	BBH-10	0.020	600	0.103	7502.000	0.386
Subtotal						13.30

The following calculations determine the amount of emissions created by unpaved roads, based on 8760 hours of use and AP-42, Ch 11.2.1.

Total mileage: 423 miles per year

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

= 4.46 lb/mile

where k = 0.36 (particle size multiplier)

s = 10 % silt content of unpaved roads

p = 102 days of rain greater than or equal to 0.01 inches

S = 15 miles/hr vehicle speed

W = 22 tons average vehicle weight

w = 12 wheels

4.46 lb/mi x	423 mi/yr =	0.942	tons/yr
	2000 lb/ton		

subtotal	14.245	tons/yr
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Methodology

Emission Rate in lbs/hr (after controls) = (grains/cub. ft.) (sq. ft.) ((cub. ft./min.)/sq. ft.) (60 min/hr) (lb/7000 grains)

Emission Rate in tons/yr = (lbs/hr) (8760 hr/yr) (ton/2000 lb)

Emission Rate in lbs/hr (before controls) = Emission Rate (after controls): (lbs/hr)/(1-control efficiency)

Emission Rate in tons/yr = (lbs/hr) (8760 hr/yr) (ton/2000 lb)

Appendix A: Emissions Calculations
Natural Gas Combustion Only
10 < MM BTU/HR <100

Company Name: United States Gypsum Company
Address City IN Zip: 3501 Canal Street, East Chicago, Indiana 46312
CP: 089-8657
Plt ID: 089-00333
Reviewer: Mark L. Kramer
Date: June 4, 1997

Equipment to Be Removed

Actual Emissions

Two (2) Drying Kilns: Wet End & Wet Center 28 MMBtu/hr, each (B-4 & B-5)	Actual Hours	7502
Two (2) Drying Kilns: Dry End & Dry Center 12 MMBtu/hr, each (unk & B-6)	Actual Hours	7502
One (1) #1 Kettle 15 MMBtu/hr (M-5)	Actual Hours	0

Heat Input Capacity MMBtu/hr	Potential Throughput MMCF/yr
80.0	600.2

Emission Factor in lb/MMCF	Pollutant					
	PM	PM10	SO2	NOx	VOC	CO
	13.7	13.7	0.6	140.0	2.8	35.0
Potential Emission in tons/yr	4.11	4.11	0.180	42.0	0.840	10.50

Cleaver Brooks Boiler 8.4 MMBtu/hr (M3)	Actual Hours	8322
Wickes Boiler 3.4 MMBtu/hr (M4)	Actual Hours	438
Rotary Dryer 10 MMBtu/hr (M11)	Actual Hours	6012

Heat Input Capacity MMBtu/hr	Potential Throughput MMCF/yr
8.4	69.9
3.4	1.5
10.0	60.1
Total	131.5

Emission Factor in lb/MMCF	Pollutant					
	PM	PM10	SO2	NOx	VOC	CO
	12.0	12.0	0.6	100.0	5.3	21.0
Potential Emission in tons/yr	0.789	0.789	0.039	6.576	0.349	1.381

Equip Removed	Subtotal Combustion:	4.900	4.900	0.220	48.587	1.189	11.884
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Equip Removed	Subtotal Process:	14.250	14.250
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Actual	Total Removed	tons/yr	19.150	19.150	0.220	48.587	1.189	11.884
Potential	New Process	tons/yr	21.600	21.600				
	New Combustion	tons/yr	11.150	11.150	0.501	72.000	2.758	41.860
	Total Potential	tons/yr	32.750	32.750	0.501	72.000	2.758	41.860
Net	Potential - Actual	tons/yr	13.60	13.60	0.28	23.41	1.57	29.98

**Appendix A: Emissions Calculations
Natural Gas Combustion Only
10 < MM BTU/HR <100**

Company Name: United States Gypsum Company
Address City IN Zip: 3501 Canal Street, East Chicago, Indiana 46312
CP: 089-8657
Plt ID: 089-00333
Reviewer: Mark L. Kramer
Date: June 4, 1997

One (1) Dryer Mill Air Heater at 20 MMBtu/hr (M12)

Heat Input Capacity Potential Throughput
MMBtu/hr MMCF/yr

20.0

175

Emission Factor in lb/MMCF	Pollutant					
	PM	PM10	SO2	NOx	VOC	CO
	13.7	13.7	0.6	140.0	2.8	35.0
Potential Emission in tons/yr	1.20	1.20	0.053	12.3	0.245	3.07

One (1) Wet Zone Kiln Burner and One (1) Dry Zone Kiln Burner at 66 MMBtu/hr, Each (Low NOx) (B20 & B21)

Total Heat Input Capacity Potential Throughput
MMBtu/hr MMCF/yr

132.0

1156

Emission Factor in lb/MMCF	Pollutant					
	PM	PM10	SO2	NOx	VOC	CO
	13.7	13.7	0.6	74.0	2.8	61.0
Potential Emission in tons/yr	7.92	7.92	0.347	42.8	1.62	35.3

Total Potential Emission in tons/yr	9.12	9.12	0.399	55.0	1.86	38.3
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Methodology

MMBtu = 1,000,000 Btu

MMCF = 1,000,000 Cubic Feet of Gas

Emission Factors for NOx: Uncontrolled = 140, Low NOx Burner = 74, Flue gas recirculation = 30

Emission Factors for CO: Uncontrolled = 35, Low NOx Burner = 61, Flue gas recirculation = 37

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, Tables 1.4-1, 1.4-2, 1.4-3, SCC #1-02-006-02 (low NOx burner NOx from manufacturer)

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

**Appendix A: Emission Calculations
Natural Gas Combustion Only
MM Btu/hr 0.3 - < 10**

**Company Name: United States Gypsum Company
Address City IN Zip: 3501 Canal Street, East Chicago, Indiana 46312
CP: 089-8657
Plt ID: 089-00333
Reviewer: Mark L. Kramer
Date: June 4, 1997**

**One (1) Gauging Water Heater at 3.5 MMBtu/hr (B19)
Six (6) Burners at 5 MMBtu/hr, Each (M14)
One (1) Drying Kiln Wet Zone Seal and One (1) Drying Kiln Dry Zone Seal at 1.5 MMBtu/hr, Each (B22 & B23)
One (1) Paper heater at 2.2 MMBtu/hr (B26)**

Heat Input Capacity MMBtu/hr	Potential Throughput MMCF/yr
38.7	339.0

Pollutant

	PM	PM10	SO2	NOx	VOC	CO
Emission Factor in lb/MMCF	12.0	12.0	0.6	100.0	5.3	21.0
Potential Emission in tons/yr	2.03	2.03	0.102	17.0	0.898	3.56

Methodology

MMBtu = 1,000,000 Btu

MMCF = 1,000,000 Cubic Feet of Gas

Emission Factors for NOx: uncontrolled = 100, Low NOx Burner = 17, Flue gas recirculation = 36

Emission Factors for CO: uncontrolled = 21, Low NOx Burner = 27, Flue gas recirculation = ND

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

Emission Factors from AP 42, Chapter 1.4, Tables 1.4-1, 1.4-2, and 1.4-3, SCC #1-03-006-03

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

Indiana Department of Environmental Management Office of Air Management

Addendum to the Technical Support Document for New Construction and Operation

Source Name: United States Gypsum Company
 Source Location: 3501 Canal Street, East Chicago, Indiana 46312
 County: Lake
 Construction Permit No.: CP 089-8657-00333
 SIC Code: 3275
 Permit Reviewer: Mark L. Kramer

On November 26 the Office of Air Management (OAM) had a notice published in the Gary Post Tribune in Gary and the Hammond Times in Gary and Munster, Indiana, stating that United States Gypsum Company had applied for a construction permit to construct and operate a modification to an existing permitted gypsum wallboard manufacturing source. The notice also stated that OAM proposed to issue a permit for this installation and provided information on how the public could review the proposed permit and other documentation. Finally, the notice informed interested parties that there was a period of thirty (30) days to provide comments on whether or not this permit should be issued as proposed.

On December 19, 1997, Frank May of United States Gypsum Company, submitted comments received on December 29, 1997, on the proposed construction permit. The comments and corresponding responses are as follows:

COMMENT 1:

Permit, Page 2 of 15, Item "q" and TSD, Page 2 of 8, Item "q" - This equipment should be described as a "wet end seal heater" not "wet zone kiln natural gas-fired burner," in order to avoid confusion with item "o".

Permit, Page 2 of 15, Item "r" and TSD, Page 2 of 8, Item "r"- This item should be described as "dry end seal heater" for the same reason as cited above.

RESPONSE 1:

The equipment list on Page 2 of 15 of the Permit has been revised from:

- (q) One (1) wet zone kiln natural gas-fired burner rated at 1.5 million British thermal units per hour, known as B-22, exhausted through stack B-22.
- (r) One (1) dry zone kiln natural gas-fired burner rated at 1.5 million British thermal units per hour, known as B-23, exhausted through stack B-23.

to:

- (q) One (1) wet **end seal** natural gas-fired **heater** rated at 1.5 million British thermal units per hour, known as B-22, exhausted through stack B-22.
- (r) One (1) dry **end seal** natural gas-fired **heater** rated at 1.5 million British thermal units per hour, known as B-23, exhausted through stack B-23.

COMMENT 2:

Permit, Page 11 of 15, Item "n" and TSD, Page 3 of 8, Item "n" - This item should be described as "#1 kettle", not "natural gas-fired boiler".

RESPONSE 2:

Item (n) of Operation Condition 17 of the Permit has been revised from:

One (1) natural gas-fired boiler, #1 kettle known as M-5, rated at 15.0 million British thermal units per hour.

to:

One (1) natural gas-fired #1 kettle, known as M-5, rated at 15.0 million British thermal units per hour.

COMMENT 3:

TSD, Page 3 of 8, Chart Labeled "Stack Summary" - The chart should be described as "new equipment", otherwise it might be confused with equipment to be removed.

RESPONSE 3:

Your point is well taken, and the stack information in the TSD refers to only new equipment.

COMMENT 4:

TSD, Page 4 of 8, Chart Labeled "Total Potential and Allowable Emissions" - The figure in column 2 for particulate matter should be 83.7 not 80,165.

Column 2, allowable emissions is incorrect with respect to all items shown. The Summary Chart which accompanied my September 24, 1997 letter has the correct totals. However, I believe the difference is an error in transcription, not differences in calculation. I have revised the September 24, 1997 chart (attached) to show the correct totals.

SOURCE TYPE	PM ₁₀	SO ₂	NO _x	CO	VOC
I Existing Emissions					
Particulate	112.554				
Combustion	9.88				
Particulate & Combustion Total	112.442	0.429	101.144	25.244	1.978
II New & Modified Sources					
Particulate	22.037				
Combustion	11.442	0.497	71.947	44.249	2.288
Particulate & Combustion Total	33.479	0.497	71.947	44.249	2.288
III Sources to be Shut Down					
Particulate	13.833				
Combustion	5.009	0.220	49.789	12.803	1.024
Particulate & Combustion Total	18.842	0.220	49.789	12.803	1.024
IV Net Emission Increases & Decreases					
	14.637	0.277	22.158	31.446	1.264
Total New Emissions (I + II + 111)					
	137.079	0.706	123.302	56.690	3.242

RESPONSE 4:

The potential PM emissions, before controls, are 80,165 tons per year. The allowable PM emissions pursuant to 326 IAC 6-3-2 are 83.7 tons per year. The allowable emissions pursuant to 326 IAC 6-3-2 only pertain to PM and not PM₁₀. Since allowable PM₁₀ can not exceed allowable PM emissions, the allowable PM₁₀ emissions should have been listed as 83.7 tons per year. This section of the TSD has been abstracted and updated as follows:

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/yr)	Potential Emissions (tons/yr)
Particulate Matter (PM)	83.7	80,165
Particulate Matter (PM ₁₀)	83.7	80,165
Sulfur Dioxide (SO ₂)	0.501	0.501
Volatile Organic Compounds (VOC)	2.76	2.76
Carbon Monoxide (CO)	41.9	41.9
Nitrogen Oxides (NO _x)	72.0	72.0
Single Hazardous Air Pollutant (HAP)	0.00	0.00
Combination of HAPs	0.00	0.00

- (a) Allowable PM emissions are determined from the applicability of rule 326 IAC 6-1. See attached spreadsheets for detailed calculations, Appendix A, page 4 of 4.
- (b) The allowable PM emissions based on the rules cited are less than the potential emissions, therefore, the allowable emissions are used for the permitting determination.
- (c) Allowable emissions (as defined in the Indiana Rule) of particulate matter, carbon monoxide and nitrogen oxides are greater than 25 tons per year. Therefore, pursuant to 326 IAC 2-1, Sections 1 and 3, a construction permit is required.

The revision in allowable PM₁₀ emissions does not require that any change be made to the Construction Permit.

Furthermore, the calculations in Appendix A of the TSD are based on information provided and the minor differences do not affect the issuance of the proposed permit.

COMMENT 5:

TSD, Page 8 of 15, Item 12(a) - We request that the pressure drop range be 2 to 8 inches of water (not the presently stated 4 to 8 inches of water) since some of our collectors are lightly loaded and operated at lower pressure drop.

RESPONSE 5:

Operation Condition No. 12(a) has been changed from:

Baghouse Operating Condition

That the thirteen (13) baghouses shall be operated at all times when the gypsum wallboard manufacturing processes are in operation.

- (a) The permittee shall take readings of the total static pressure drop across the baghouses, at least once per day. Unless operated under conditions for which the Preventive Maintenance Plan specifies otherwise, the pressure drop across the baghouses shall be maintained within

the range of 4 and 8 inches of water. The Preventive Maintenance Plan for these baghouses shall contain troubleshooting contingency and corrective actions for when the pressure reading is outside of this range for any one reading.

to

Baghouse Operating Condition

That the thirteen (13) baghouses shall be operated at all times when the gypsum wallboard manufacturing processes are in operation.

- (a) The permittee shall take readings of the total static pressure drop across the baghouses, at least once per day. Unless operated under conditions for which the Preventive Maintenance Plan specifies otherwise, the pressure drop across the baghouses shall be maintained within the range of **2** and 8 inches of water. The Preventive Maintenance Plan for these baghouses shall contain troubleshooting contingency and corrective actions for when the pressure reading is outside of this range for any one reading.