

**CONSTRUCTION PERMIT
OFFICE OF AIR MANAGEMENT**

**Genpak, LLC
845 South Elm Street
Scottsburg, Indiana 47170**

is hereby authorized to construct

a modification to the currently existing stationary polystyrene foam extrusion operation. The facilities included in this modification are as follows:

1. Two (2) polystyrene foam tandem extruders, identified as EPS-2 and EPS-3, each extruding a maximum of 1,100 pounds per hour virgin polystyrene, and exhausting inside the building, and
2. One (1) Recuperative Thermal Oxidizer with a rated heat input of 1.0 million British thermal units (mmBtu) per hour, and exhausting through INCIN-1. This unit will control the existing repelletizer emissions.

extruding a maximum of 2,200 pounds per hour of polystyrene.

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-143-9851-00016	
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 2-7-19 (Fees)
 - (e) The Permittee shall apply for their Part 70 permit by April 3, 1999 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:

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 stationary polystyrene foam extrusion operation 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, 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 volatile organic compounds (VOC) on stack INCIN-1 to determine proper operating parameters for the thermal oxidizer, including minimum operating temperatures and fan speeds, to achieve an overall control efficiency of 80.75% (the overall control efficiency includes the capture efficiency and destruction efficiency of the catalytic oxidizer), 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 July 1 of each year and must comply with the minimum requirements specified in 326 IAC 2-6-4. 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 January 1 and ending December 31.

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 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.

Particulate Matter Limitation

11. That pursuant to 326 IAC 6-3 (Process Operations), the fabric filters shall be in operation at all times when the polystyrene foam scrap regrind operation is in operation, and particulate matter (PM) emissions from each of the two (2) polystyrene foam tandem extruders (ID EPS-2 and EPS-3) shall not exceed the allowable particulate matter (PM) emission rate of 2.75 pounds per hour.

Fugitive Dust Emissions

12. 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)].

BACT Condition

13. That pursuant to 326 IAC 8-1-6 the Best Available Control Technology (BACT) for the stationary polystyrene foam extrusion operation has been determined to be VOC emission control by a recuperative thermal oxidizer controlling exhaust from the repelletizer for three (3) polystyrene extrusion lines, controlling 53.04 tons of VOC emissions per year. The source shall meet the following:
- (a) The recuperative thermal oxidizer shall be used at all times that the polystyrene foam repelletizing line is in operation.
 - (b) Compliance tests in Operation Condition 7 are necessary and will be used to develop surrogate parameters.
 - (c) That input of VOC, minus the VOC solvent shipped out, delivered to the three (3) polystyrene extrusion lines shall be limited to 45.99 tons per month. This is equivalent to VOC emissions of 7.70 tons per month. During the first 365 days of operation, VOC usage shall be limited such that the total VOC used divided by accumulated months of operation shall not exceed the limits specified.

Thermal Oxidizer Operation

14. That the thermal incinerator shall operate at all times that the one (1) polystyrene repelletizer is operated. When operating, the thermal incinerator shall maintain a minimum operating temperature of 1,400° F or a temperature, fan amperage and duct velocity determined in the compliance tests (described in Operation Condition 7) to maintain an overall control efficiency of 80.75% (the overall control efficiency includes the capture efficiency and destruction efficiency of the catalytic oxidizer) of volatile organic compound (VOC).

Recordkeeping Requirements

15. That a log of information necessary to document compliance with operation permit condition no. 13 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) These records shall include operating parameters for the recuperative thermal oxidizer including blowing agent usage and the dates of use for the three (3) polystyrene extrusion lines (ID EPS-1, EPS-2, and EPS-3).
- (b) Unless otherwise specified in this permit, any notice, report, or other submissions required by this permit shall be timely if:
 - (i) 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 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.

**Indiana Department of Environmental Management
Office of Air Management
Compliance Data Section**

Quarterly Report

Company Name: Genpak, LLC
Location: 845 South Elm Street, Scottsburg, Indiana 47170
Permit No.: CP-143-9851-00016
Source: three (3) polystyrene extrusion lines (ID EPS-1, EPS-2, and EPS-3)
Pollutant: VOC
Limit: 45.99 tons/month

Year: _____

Month	VOC Usage/Emissions (tons/month)		

Submitted by: _____

Title/Position: _____

Signature: _____

Date: _____

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 THE NEXT PAGE ? Y N

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

COMPANY: Genpak, LLC PHONE NO. (812) 752-3111
LOCATION: (CITY AND COUNTY) Scottsburg, Scott County
PERMIT NO. CP-143-9851 AFS PLANT ID: 143-00016 AFS POINT ID: _____ INSP: Joe Foyst
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: _____

Indiana Department of Environmental Management Office of Air Management

Technical Support Document (TSD) for New Construction and Operation

Source Background and Description

Source Name: Genpak, LLC
 Source Location: 845 South Elm Street, Scottsburg, Indiana, 47170
 County: Scott
 Construction Permit No.: CP-143-9851-00016
 SIC Code: 3089
 Permit Reviewer: Phillip Ritz/EVP

The Office of Air Management (OAM) has reviewed an application from Genpak, LLC relating to the construction and operation of a modification to a stationary polystyrene foam extrusion operation, consisting of the following equipment:

- (a) Two (2) polystyrene foam tandem extruders, identified as EPS-2 and EPS-3, each extruding a maximum of 1,100 pounds per hour polystyrene, and exhausting through INCIN-1, and
- (b) One (1) Recuperative Thermal Oxidizer with a rated heat input of 1.0 million British thermal units (mmBtu) per hour, and exhausting through INCIN-1. This unit will control the existing repelletizer emissions.

Stack Summary

Stack ID	Operation	Height (feet)	Diameter (feet)	Flow Rate (acfm)	Temperature (°F)
INCIN-1	Polystyrene Foam Extrusion	30	1.5	2000	200

Recommendation

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

Unless otherwise stated, information 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 12, 1998, with additional information received on June 30, 1998 and on July 9, 1998.

Emissions Calculations

See Appendix A: Emissions Calculations for detailed calculations (four (4) 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 for the new polystyrene foam extrusion operation at maximum capacity):

Pollutant	Allowable Emissions (tons/year)	Potential Emissions (tons/year)
Particulate Matter (PM)	24.09	139.62
Particulate Matter (PM10)	24.09	139.62
Sulfur Dioxide (SO ₂)	--	--
Volatile Organic Compounds (VOC)	--	127.61
Carbon Monoxide (CO)	--	--
Nitrogen Oxides (NO _x)	--	--
Single Hazardous Air Pollutant (HAP)	--	0.00
Combination of HAPs	--	0.00

- (a) Allowable emissions are determined from the applicability of rule 326 IAC 6-3-2. See attached spreadsheets for detailed calculations.
- (b) The allowable emissions based on the rules cited for PM are less than the potential emissions, therefore, the allowable emissions are used for PM permitting determination.
- (c) The potential emissions before control for all other criteria pollutants are used for the permitting determination.
- (d) Allowable emissions (as defined in the Indiana Rule) of Particulate Matter and Volatile Organic Compounds 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

The source is located in Scott County.

- (a) Volatile organic compounds (VOC) and oxides of nitrogen (NO_x) 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. Scott 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) Scott County has been classified as attainment or unclassifiable for all other criteria 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

Existing Source PSD Definition (emissions after controls, based on 8,760 hours of operation per year at rated capacity):

Pollutant	Emissions (ton/yr)
PM	7.02
PM10	7.02
SO ₂	0.00
VOC	106.1
CO	1.80
NO _x	7.2

- (a) This existing source is **not** a major stationary source because no attainment pollutant is emitted at a rate of 250 tons per year or greater, and is not 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.

Proposed Modification

PTE from the proposed modification (based on 8,760 hours of operation per year at rated capacity including enforceable emission control and production limits, where applicable):

Pollutant	PM (ton/yr)	PM10 (ton/yr)	SO ₂ (ton/yr)	VOC (ton/yr)	CO (ton/yr)	NO _x (ton/yr)
Proposed Modification	7.01	7.01	0.00	92.35	0.7	0.44
PSD	250	250	250	250	250	250

This modification to an existing minor stationary source is not major because the emission increase is less than the PSD significant levels. 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 source is subject to the Part 70 Permit requirements because the potential to emit (PTE) of:

- (a) PM and VOC are greater 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 source shall apply for a Part 70 (Title V) operating permit within twelve (12) months after this source became subject to Title V. Since Operation Permit CP-143-9047-00016 was issued on April 3, 1998, the source must apply for a Part 70 (Title V) operating permit by April 3, 1999.

Federal Rule Applicability

- (a) There are no New Source Performance Standards (326 IAC 12), 40 CFR Part 60, applicable to this facility.
- (b) There are no National Emission Standards for Hazardous Air Pollutants (NESHAP), 40 CFR Part 63, applicable to this facility.

State Rule Applicability

326 IAC 2-2 (Prevention of Significant Deterioration)

This source is not subject to the requirements of 326 IAC 2-2 (Prevention of Significant Deterioration) because the potential emissions of any pollutant are less than two hundred fifty (250) tons per year and it is not one of the 28 listed source categories for this rule.

326 IAC 2-6 (Emission Reporting)

This source is subject to the requirements of 326 IAC 2-6 (Emission Reporting), because the source has the potential to emit more than 100 tons per year of VOC. Pursuant to this rule, the owner/operator of this source must annually submit an emission statement of the source. The annual statement must be received by July 1 of each year and must contain the minimum requirements as specified in 326 IAC 2-6-4.

326 IAC 5-1 (Visible Emissions Limitations)

Pursuant to 326 IAC 5-1-2 (Visible Emissions Limitations), except as provided in 326 IAC 5-1-3 (Temporary Exemptions), visible emissions shall meet the following, unless otherwise stated in this permit:

- (a) Visible emissions shall not exceed an average of forty percent (40%) opacity in twenty-four (24) consecutive readings as determined by 326 IAC 5-1-4,
- (b) Visible emissions shall not exceed sixty percent (60%) opacity for more than a cumulative total of fifteen (15) minutes (sixty (60) readings) in a six (6) hour period.

326 IAC 6-3-2 (Process Operations)

Pursuant to 326 IAC 6-3-2(c), the Particulate Matter (PM) from the each of the two (2) new polystyrene extruders shall each not exceed 2.75 pounds per hour when operating at a process weight rate of 0.55 tons per hour:

Interpolation and extrapolation of the data for the process weight rate up to sixty thousand (60,000) pounds per hour shall be accomplished by use of the equation:

$$E = 4.10P^{0.67}$$

Where E = rate of emission in pounds per hour; and
P = process weight rate in tons per hour

$$2.75 = 4.10 * 0.55^{0.67}$$

Where E = 2.75 pounds per hour
P = 0.55 tons per hour

The fabric filters shall be in operation at all times the polystyrene foam scrap regrind operation is in operation in order to comply with this limit.

326 IAC 8-1-6 (New Facilities: General Reduction Requirements)

The two (2) polystyrene tandem extruders are subject to the provisions of 326 IAC 8-1-6 (New Facilities: General Reduction Requirements) because their potential volatile organic compound (VOC) emissions are greater than twenty-five tons per year each and they were constructed after the January 1, 1980 applicability date. Pursuant to CP-143-9851-00016, which states: "If any additional extrusion lines are added to this source, even if their individual volatile organic compound (VOC) emissions are less than twenty-five (25) tons per year, or if the blowing agent is to be changed to another type, a new Best Available Control Technology (BACT) analysis will be performed." Therefore, they have included the following BACT analysis for the entire source including the two (2) new polystyrene extruders.*

*As the entire source is included in the BACT analysis, the Emissions Removed (tons/yr) include the modification to the source and existing units. Therefore, the evaluation for cost per ton VOC removed does not coincide with the potential VOC emissions.

The BACT analysis for VOC was performed by the applicant and was conducted in accordance with the "Top Down BACT Guidance" U.S. EPA, Office of Air Quality Planning and Standards, March 15, 1990. The BACT analysis includes control technologies found in the U.S. EPA RACT/BACT/LAER Clearinghouse database and permits issued by the State and local agencies.

A search by the applicant has been made of RACT/BACT/LAER Clearinghouse and State Regulatory agencies, for permits issued from other states and local regulatory agencies for sources currently in operation with similar process as Genpak Corporation. The major pollutant specified was VOCs and similar sources were identified as "polystyrene foam production." Similar permits issued by IDEM and local regulatory agencies were also reviewed for similar BACT analyses. Table A below summarizes the search. No verification has been made if proposed BACT has been implemented.

(A)

Company/Location	Facility Description	Control Requirements
Western Insulfoam Phoenix, AZ	Foam panel manufacturing, polystyrene bead expansion, bead storage, pre-expansion, and molding machines.	Bead storage, pre-expanders, and molding machines are routed to boiler.
Tuscarora, Inc. Putnam, CT	Expandable polystyrene (EPS) molding.	BACT is double pass pre-expander for low VOC beads
Falcon Manf., Byron Center, MI	EPS block manf.	Expander routed to direct flame incinerator.
Tuscarora, Inc. Saginaw, MI	Pre-expansion and pre-puff molding and storage.	BACT is low VOC beads.
Tuscarora, Inc.	Pre-expansion and pre-puff molding and storage.	BACT is low VOC beads.
Amoco Foam Products Winchester, VA	Expanded polystyrene manf., food service styrofoam	BACT is VOC tpy limit, R&D on alternate blowing agents.
Cellofoam Conveyors, GA	expandable polystyrene frozen bead molding.	49.9 tpy VOC limit Boiler incinerator
Free-Flow Packaging Atlanta, GA	Manf. and expansion of polystyrene beads and manf. of polyethylene sheets.	49.9 tpy VOC limit No control equipment required.
Tenneco Plastics Covington, GA	Polystyrene foam packaging and polyethylene extrusion.	Regenerative Thermal Oxidizer 249 tpy VOC limit

In cases where control equipment has been required, one of the most frequently chosen options has been regenerative thermal oxidations.

The options considered in the BACT analysis for the polystyrene foam extrusion operation are:

- (1) Recuperative Thermal Oxidizer
- (2) Regenerative Thermal Oxidation
- (3) Recuperative Catalytic Incinerator
- (4) Regenerative Catalytic Incinerator
- (5) Flare
- (6) Carbon Adsorption
- (7) Carbon Adsorption-Oxidation

Options (2) through (7) have been determined to have a low to moderate technical feasibility for the following reasons:

- (2) Regenerative Thermal Oxidation
 Plastic particulates can settle on the beds and cause fires, lower heat transfer and lower removal efficiency.

- (3) Recuperative Catalytic Incinerator
Plastic particulates can settle on the beds and cause fires, lower heat transfer and lower removal efficiency.
- (4) Regenerative Catalytic Incinerator
Plastic particulates can settle on the catalyst and cause fires, and lower removal efficiency.
- (5) Flare
Concentration requirement is high. It is difficult to sustain the flame.
- (6) Carbon Adsorption
Plastic particulates can settle in the chamber and cause fires, and lower removal efficiency.
- (7) Carbon Adsorption-Oxidation
Plastic particulates can settle in the chamber and cause fires, and lower removal efficiency. There is a fire or explosion hazard in the carbon chamber.

The technically feasible option is recuperative thermal oxidation. Genpak has evaluated the VOC reduction for thermal oxidation based on assumed 95% destruction efficiency of the thermal incinerator and 85% capture of the blowing agent. In order to evaluate the economic feasibility of recuperative thermal oxidation for various sources of VOC emissions as well as all potential VOC emissions, Genpak evaluated nine (9) control scenarios.

1. Silo exhaust for three (3) polystyrene extruders
2. Silo and Repelletizer for three (3) polystyrene extruders
3. Extruder for three (3) polystyrene extruders
4. Repelletizer for three (3) polystyrene extruders and 1CPET Extruder
5. Silo for three (3) polystyrene extruders and 1 CPET Extruder
6. Repelletizer and Silo for three (3) polystyrene extruders and 1 CPET Extruder
7. Extruder for three (3) polystyrene extruders and 1 CPET Extruder
8. Extruder, Repelletizer and Silo for 3 PS and 1 CPET Extruder
9. Repelletizer for three (3) polystyrene extruders

The tables B through D below show the results of the cost analysis.

(B) Capital Cost

Option	Base Price	Direct Cost	Indirect Cost	Total
Silo exhaust for 3 PS	\$267,301.00	\$158,572.00	\$15,960.00	\$441,833.00
Silo and Repelletizer for 3PS	\$932,893.00	\$545,950.00	\$32,438.00	\$1,511,281.00
Extruder for 3 PS	\$277,301.00	\$158,572.00	\$15,960.00	\$451,833.00
Repelletizer for 3PS and 1CPET Extruder	\$267,301.00	\$158,572.00	\$15,960.00	\$441,833.00
Silo for 3 PS and 1 CPET Extruder	\$267,301.00	\$158,572.00	\$15,960.00	\$441,833.00
Repelletizer and Silo for 3 PS and 1 CPET Extruder	\$932,893.00	\$545,950.00	\$32,438.00	\$1,511,281.00
Extruder for 3 PS and 1 CPET Extruder	\$277,301.00	\$158,572.00	\$15,960.00	\$451,833.00
Extruder, Repelletizer and Silo for 3 PS and 1 CPET Extruder	\$277,301.00	\$158,572.00	\$15,960.00	\$451,833.00
Repelletizer for 3 PS	\$246,031.00	\$119,842.00	\$15,960.00	\$381,833.00

(C) Annual Operating, Maintenance & Recovery Cost

Option	Direct Cost	Indirect Cost	Capital Recovery Cost	Total
Silo exhaust for 3 PS	\$358,800.00	\$0.00	\$116,555.00	\$475,355.00
Silo and Repelletizer for 3 PS	\$516,480.00	\$0.00	\$398,672.00	\$915,152.00
Extruder for 3 PS	\$884,400.00	\$0.00	\$119,192.00	\$1,003,592.00
Repelletizer for 3 PS and 1CPET Extruder	\$306,240.00	\$0.00	\$116,555.00	\$422,795.00
Silo for 3PS and 1CPET Extruder	\$411,360.00	\$0.00	\$116,555.00	\$527,915.00
Repelletizer and Silo for 3 PS and 1 CPET Extruder	\$569,040.00	\$0.00	\$398,672.00	\$967,712.00
Extruder for 3 PS and 1 CPET Extruder	\$1,199,760.00	\$0.00	\$119,192.00	\$1,318,952.00
Extruder, Repelletizer and Silo for 3 PS and 1 CPET Extruder	\$1,094,640.00	\$0.00	\$119,192.00	\$1,213,832.00
Repelletizer for 3 PS	\$96,000.00	\$0.00	\$100,727.00	\$196,727.00

(1) Total Cost includes Direct, Indirect, and Capital Recovery Costs.

(D)

Evaluation

Option	Potential Emissions (tons/yr)	Emissions Removed (tons/yr)*	Control Efficiency (%)	\$/ton Removed
Silo exhaust for 3 PS	234.46	65.88	28.10%	\$7,215.00
Silo and Repelletizer for 3 PS	234.46	115.94	49.45%	\$7,893.00
Extruder for 3 PS	234.46	35.64	15.20%	\$28,159.00
Repelletizer for 3 PS and 1CPET Extruder	234.46	59.91	25.55%	\$7,057.00
Silo for 3PS and 1CPET Extruder	234.46	72.75	31.03%	\$7,257.00
Repelletizer and Silo for 3 PS and 1 CPET Extruder	234.46	132.66	56.58%	\$7,295.00
Extruder for 3 PS and 1 CPET Extruder	234.46	56.65	24.16%	\$23,282.00
Extruder, Repelletizer and Silo for 3 PS and 1 CPET Extruder	234.46	189.27	80.73%	\$6,413.00
Repelletizer for 3 PS	234.46	53.04	22.62%	\$3,709.00

*As the entire source is included in the BACT analysis, the Emissions Removed (tons/yr) include the modification to the source and existing units. Therefore, the evaluation for cost per ton VOC removed does not coincide with the potential VOC emissions.

Methodology:

Emissions removed = (potential emissions from repelletizer) * (control efficiency)

\$/ton removed = total annual cost / emissions removed

The cost breakdown is as follows:

1. Capital Cost
 - (a) Base price: purchase price, auxiliary equipment, instruments, controls, taxes and freight.
 - (b) Direct installation cost: foundations/supports, erection/handling, electrical, piping, insulation, painting, site preparation and building/facility.
 - (c) Indirect installation cost: engineering, supervision, construction/field expenses, construction fee, start up, performance test, model study and contingencies.

2. Annual Cost
 - (a) Direct operating cost: operating labor (operator, supervisor), labor and material maintenance, operating materials, utilities (electricity, gas).
 - (b) Indirect operating cost: overhead, property tax, insurance, administration and capital recovery cost (for 10 years life of the system at 10% interest rate).

Genpak's economic analysis of system operation shows a cost of \$3,709 to \$28,159 per ton VOC removed by recuperative thermal oxidation. Since the evaluated BACT controls indicate that the one (1) polystyrene repelletizer was the most cost efficient method, Genpak proposes BACT to be the use of recuperative thermal oxidation on the one (1) polystyrene repelletizer exhaust. Therefore, BACT for the stationary polystyrene foam extrusion operation has been determined to be VOC emission control by a recuperative thermal oxidizer controlling 53.04 tons of VOC exhaust from the repelletizer for three (3) polystyrene extrusion lines, by capturing 35.36 tons per year of VOC from the two (2) new polystyrene extruders and 17.68 tons per year of VOC from the one (1) existing polystyrene extruder.

326 IAC 8-6 (Organic Solvent Emission Limitations)

The two (2) polystyrene foam tandem extruders are not subject to the requirements of 326 IAC 8-6 (Organic Solvent Emission Limitations) because this source is not located in Lake or Marion County and commenced operation after January 1, 1980.

No other Article 8 rules apply to this source.

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 source.

Conclusion

The operation of this modification to a polystyrene foam extrusion operation will be subject to the conditions of the attached proposed **Construction Permit No. CP-143-9851-00016**.

Total Source Emissions

Appendix A: Emission Calculations

From Polystyrene Foam Extrusion

Company Name Genpak, LLC

Address City 845 South Elm Street, Scottsburg, IN 47170

CP: 143-9851

Plt ID: 143-00016

Reviewer: Phillip Ritz

Date: June 12, 1998

Controlled Emissions (tons/year)

Emissions Generating Activity

Pollutant	Recuperative Thermal Oxidizer	EPS-2	EPS-3	TOTAL
				tons per year
PM	0.03	3.49	3.49	7.01
PM10	0.03	3.49	3.49	7.01
SO2	0.00	0.00	0.00	0.00
NOx	0.44	0.00	0.00	0.44
VOC	0.02	46.12	46.21	92.35
CO	0.37	0.00	0.00	0.37
total HAPs	0.00	0.00	0.00	0.00
worst case single HAP	0.00	0.00	0.00	0.00

Potential Emissions (tons/year)

Emissions Generating Activity

Pollutant	Recuperative Thermal Oxidizer	EPS-2	EPS-3	TOTAL
				tons per year
PM	0.00	69.81	69.81	139.62
PM10	0.00	69.81	69.81	139.62
SO2	0.00	0.00	0.00	0.00
NOx	0.00	0.00	0.00	0.00
VOC	0.00	63.81	63.81	127.62
CO	0.00	0.00	0.00	0.00
total HAPs	0.00	0.00	0.00	0.00
worst case single HAP	0.00	0.00	0.00	0.00

Total emissions based on rated capacity at 8,760 hours/year, before control.

VOC Emissions

From Polystyrene Foam Extrusion

Company Name: Genpak, LLC
Address City IN Zip: 845 South Elm Street, Scottsburg, IN 47170
CP: 143-9851
Plt ID: 143-00016
Reviewer: Phillip Ritz
Date: June 12, 1998

Uncontrolled VOC

Extrusion, Warehouse and Thermoform VOC emissions

Process	Max. Rate lb/hr	% Lost	Control Efficiency	Emission lbs/hr	Emission tons/yr
eps-2	42	8.00%	0.00%	3.36	
eps-3	42	8.00%	0.00%	3.36	
total				6.72	
Extrusion, Warehouse and Thermoform VOC emissions in tons/yr					29.43

Repelletizer and Silo VOC Emissions

Process	Max. Rate lb/hr	% Remaining after Thermoform	% Reground	% Emitted w/o control	Control Efficiency	Emission lbs/hr	Emission tons/yr
eps-2	42	92.00%	29.00%	100.00%	0.00%	11.21	
eps-3	42	92.00%	29.00%	100.00%	0.00%	11.21	
total						22.42	
Repelletizer and Silo VOC Emissions in tons/year							98.18
Total Uncontrolled VOC Emissions							127.61

Controlled VOC

Extrusion, Warehouse and Thermoform VOC emissions

Process	Max. Rate lb/hr	% Lost	Control Efficiency	Emission lbs/hr	Emission tons/yr
eps-2	42	8.00%	0.00%	3.36	
eps-3	42	8.00%	0.00%	3.36	
total				6.72	
Extrusion, Warehouse and Thermoform VOC emissions in tons/yr					29.43

Repelletizer and Silo VOC Emissions

Process	Max. Rate lb/hr	% Remaining after Thermoform	% Reground	% Emitted w/o control	Control Efficiency	Emission lbs/hr	Emission tons/yr
eps-2	42	92.00%	29.00%	44.60%	80.75%	7.17	
eps-3	42	92.00%	29.00%	44.60%	80.75%	7.17	
total						14.34	
Repelletizer and Silo VOC Emissions in tons/year							62.81
Total Controlled VOC Emissions							92.24

Blowing agent (Classified Information) is the only material containing VOCs in this facility. The max rate is for the blowing agent usage in polystyrene extrusion.

METHODOLOGY:

During extrusion, warehousing, and thermoforming there is an 8% loss of blowing agent (Confidential Information).

After extrusion, warehousing, and thermoforming, 29% of the materials are reground.

Ratio of VOC emissions from repelletizing and silo sections are (15 lbs repelletizer to 28 lbs silo) 34.88% repelletizer and 65.12% silo emissions.

During repelletizer there is a 100% loss of blowing agent, 85% of which is captured and controlled at 95% efficiency.

E.G. (42*0.08 loss of blowing agent = 3.36 lbs/hr) and (42*0.92 remains after thermoforming*0.29 scrap*1.0 = 11.21 lbs /hr).

Appendix A: Emission Calculations
Natural Gas Combustion for Recuperative Thermal Oxidizer
MM Btu/hr 0.3 - < 100

Company Name: Genpak, LLC
Address City IN Zip: 845 South Elm Street, Scottsburg, IN 47170
CP: 143-9851
Plt ID: 143-00016
Reviewer: Phillip Ritz
Date: June 12, 1998

Heat Input Capacity
MMBtu/hr

Potential Throughput
MMCF/yr

1.0

8.8

Heat Input Capacity includes:

One (1) Thermal Recuperative Oxidizer with a rated heat input of 1 MMBtu

	Pollutant					
	PM	PM10	SO2	NOx	VOC	CO
Emission Factor in lb/MMCF	7.6	7.6	0.6	100.0	5.5	84.0
Potential Emission in tons/yr	0.03	0.03	0.00	0.44	0.02	0.37

Methodology:

MMBtu = 1,000,000 Btu

MMCF = 1,000,000 Cubic Feet of Gas

Emission Factors for NOx: uncontrolled = 100, Low Nox Burner = 50, Flue gas recirculation = 32

All PM is assumed to be less than 1.0 micrometer in diameter. Therefore, the PM emission factors may be used to estimate PM10, PM2.5, and PM1 emissions.

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 #1-01-006-02, #1-02-006-02, #1-03-006-02, #1-03-006-03

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

**Particulate Matter Emissions
From Polystyrene Foam Extrusion
Modification to source**

Company Name: Genpak, LLC
Address City IN Zip: 845 South Elm Street, Scottsburg, IN 47170
CP: 143-9851
Plt ID: 143-00016
Reviewer: Phillip Ritz
Date: June 12, 1998

Uncontrolled Carryover Loss

Process	Max. Rate tons/hr	% lost	PM Emissions tons/hr	PM Emissions tons/yr
EPS-2	0.1595	5.00%	0.01	69.86
EPS-3	0.1595	5.00%	0.01	69.86
Total Potential Emissions				139.72
Controlled PM Emissions at 95% Efficiency				6.99

METHODOLOGY

When transferring materials 5% carryover occurs (i.e. 5% of material could escape if not controlled)

Controlled potential emissions calculated using 95% efficiency fabric filter

Indiana Department of Environmental Management Office of Air Management

Addendum to the Technical Support Document for New Construction and Operation

Source Name: Genpak, LLC
Source Location: 845 South Elm Street, Scottsburg, Indiana, 47170
County: Scott
Construction Permit No.: CP-143-9851-00016
SIC Code: 3089
Permit Reviewer: Phillip Ritz/EVP

On September 12, 1998, the Office of Air Management (OAM) had a notice published in the Scott County Journal, Scottsburg, Indiana, stating that Genpak, LLC had applied for a construction permit to construct and operate a modification to a stationary polystyrene foam extrusion operation with control. 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.

Upon further review by the OAM, the following revisions shall be incorporated into Construction Permit CP-143-9851-00016:

1. On page 1 of the Construction Permit, paragraph (1), which reads "Two (2) polystyrene foam tandem extruders, identified as EPS-2 and EPS-3, each extruding a maximum of 1,100 pounds per hour virgin polystyrene, and exhausting through INCIN-1, and", has been changed to read as follows:

"Two (2) polystyrene foam tandem extruders, identified as EPS-2 and EPS-3, each extruding a maximum of 1,100 pounds per hour virgin polystyrene, and exhausting inside the building, and"

2. Operating Condition #7 of the Construction Permit paragraph, the first sentence which reads "That pursuant to 326 IAC 2-1-3 (Construction and Operating Permit Requirements) compliance stack tests shall be performed ... to achieve a minimum VOC destruction efficiency of 95.0%, within 60 days after achieving maximum production rate, but no later than 180 days after initial start-up.", has been changed to read as follows:

"That pursuant to 326 IAC 2-1-3 (Construction and Operating Permit Requirements) compliance stack tests shall be performed... to achieve an overall control efficiency of 80.75% (the overall control efficiency includes the capture efficiency and destruction efficiency of the catalytic oxidizer)."

3. Under Operating Condition #14 of the Construction Permit, paragraph (1), which reads "That the thermal incinerator shall operate at all times...to maintain a minimum 85% capture of VOC emissions from the repelletizer for three (3) polystyrene extrusion lines and 95% destruction of the volatile organic compound (VOC) captured.", has been changed to read as follows:

4. "That the thermal incinerator shall operate at all times...to maintain an overall control efficiency of 80.75% (the overall control efficiency includes the capture efficiency and destruction efficiency of the catalytic oxidizer) of volatile organic compound (VOC)."

5. Under Source Background and Description in the Technical Support Document, paragraph (a), which reads "Two (2) polystyrene foam tandem extruders, identified as EPS-2 and EPS-3, each extruding a maximum of 1,100 pounds per hour virgin polystyrene, and exhausting through INCIN-1, and", has been changed to read as follows:

"Two (2) polystyrene foam tandem extruders, identified as EPS-2 and EPS-3, each extruding a maximum of 1,100 pounds per hour virgin polystyrene, and exhausting inside the building, and"

6. Under Stack Summary in the Technical Support Document, paragraph (a), which reads "

Stack ID	Operation	Height (feet)	Diameter (feet)	Flow Rate (acfm)	Temperature (°F)
INCIN-1	Polystyrene Foam Extrusion	30	1.5	2000	200

has been changed to read as follows:

Stack ID	Operation	Height (feet)	Diameter (feet)	Flow Rate (acfm)	Temperature (°F)
INCIN-1	Recuperative Thermal Oxidizer	30	1.5	2000	200