



INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

We Protect Hoosiers and Our Environment.

Michael R. Pence
Governor

Thomas W. Easterly
Commissioner

100 North Senate Avenue
Indianapolis, Indiana 46204
(317) 232-8603
Toll Free (800) 451-6027
www.idem.IN.gov

TO: Interested Parties / Applicant

DATE: January 16, 2013

RE: Fort Recovery Industries, Inc. / 075-32440-000034

FROM: Matthew Stuckey, Branch Chief
Permits Branch
Office of Air Quality

Notice of Decision: Approval - Registration

Please be advised that on behalf of the Commissioner of the Department of Environmental Management, I have issued a decision regarding the enclosed matter. Pursuant to IC 4-21.5-3-4(d) this order is effective when it is served. When served by U.S. mail, the order is effective three (3) calendar days from the mailing of this notice pursuant to IC 4-21.5-3-2(e).

If you wish to challenge this decision, IC 4-21.5-3-7 requires that you file a petition for administrative review. This petition may include a request for stay of effectiveness and must be submitted to the Office of Environmental Adjudication, 100 North Senate Avenue, Government Center North, Suite N 501E, Indianapolis, IN 46204, **within eighteen (18) calendar days of the mailing of this notice**. The filing of a petition for administrative review is complete on the earliest of the following dates that apply to the filing:

- (1) the date the document is delivered to the Office of Environmental Adjudication (OEA);
- (2) the date of the postmark on the envelope containing the document, if the document is mailed to OEA by U.S. mail; or
- (3) The date on which the document is deposited with a private carrier, as shown by receipt issued by the carrier, if the document is sent to the OEA by private carrier.

The petition must include facts demonstrating that you are either the applicant, a person aggrieved or adversely affected by the decision or otherwise entitled to review by law. Please identify the permit, decision, or other order for which you seek review by permit number, name of the applicant, location, date of this notice and all of the following:

- (1) the name and address of the person making the request;
- (2) the interest of the person making the request;
- (3) identification of any persons represented by the person making the request;
- (4) the reasons, with particularity, for the request;
- (5) the issues, with particularity, proposed for considerations at any hearing; and
- (6) identification of the terms and conditions which, in the judgment of the person making the request, would be appropriate in the case in question to satisfy the requirements of the law governing documents of the type issued by the Commissioner.

If you have technical questions regarding the enclosed documents, please contact the Office of Air Quality, Permits Branch at (317) 233-0178. Callers from within Indiana may call toll-free at 1-800-451-6027, ext. 3-0178.

Enclosures
FN-REGIS.dot 1/2/08



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REGISTRATION OFFICE OF AIR QUALITY

Fort Recovery Industries, Inc.
710 East 100 North
Portland, Indiana 47371

Pursuant to 326 IAC 2-5.1 (Construction of New Sources: Registrations) and 326 IAC 2-5.5 (Registrations), (herein known as the Registrant) is hereby authorized to construct and operate subject to the conditions contained herein, the source described in Section A (Source Summary) of this registration.

Registration No. R075-32440-00034	
Issued by:  Iryn Calilung, Section Chief Permits Branch Office of Air Quality	Issuance Date: January 16, 2013

SECTION A

SOURCE SUMMARY

This registration is based on information requested by the Indiana Department of Environmental Management (IDEM), Office of Air Quality (OAQ). The information describing the source contained in conditions A.1 and A.2 is descriptive information and does not constitute enforceable conditions. However, the Registrant should be aware that a physical change or a change in the method of operation that may render this descriptive information obsolete or inaccurate may trigger requirements for the Registrant to obtain additional permits pursuant to 326 IAC 2.

A.1 General Information

The Registrant owns and operates a stationary aluminum and zinc molding and die casting plant, that uses aluminum and zinc ingots and is not primarily engaged in the metal recovery process.

Source Address:	710 East 100 North, Portland, Indiana 47371
General Source Phone Number:	419-375-4121
SIC Code:	3363 (Aluminum Die-castings)
County Location:	Jay
Source Location Status:	Attainment for all criteria pollutants
Source Status:	Registration

A.2 Emission Units and Pollution Control Equipment Summary

This stationary source consists of the following emission units and pollution control devices:

- (a) Six (6) natural gas-fired reverberatory aluminum and zinc melting and holding furnaces, consisting of the following:
 - (1) One (1) natural gas-fired reverberatory aluminum and zinc melting and holding furnace, identified as V41-01, constructed in 2011, rated at 2.4 MMBtu/hr, with a maximum capacity of 1,200 lbs/hr of clean aluminum or zinc, with a maximum flux rate during aluminum melt of 1.16 lbs/hr, equipped with no control, and with emissions exhausting indoors
 - (2) One (1) natural gas-fired reverberatory aluminum and zinc melting and holding furnace, identified as V41-02, constructed in 2011, rated at 2.4 MMBtu/hr, with a maximum capacity of 1,000 lbs/hr of clean aluminum or zinc, with a maximum flux rate during aluminum melt of 0.97 lbs/hr, equipped with no control, and with emissions exhausting indoors
 - (3) One (1) natural gas-fired reverberatory aluminum and zinc melting and holding furnace, identified as V41-03, constructed in 2012, rated at 2.4 MMBtu/hr, with a maximum capacity of 1,200 lbs/hr of clean aluminum or zinc, with a maximum flux rate during aluminum melt of 1.16 lbs/hr, equipped with no control, and with emissions exhausting indoors
 - (4) One (1) natural gas-fired reverberatory aluminum and zinc melting and holding furnace, identified as V41-04, approved for construction in 2012, rated at 2.4 MMBtu/hr, with a maximum capacity of 1,000 lbs/hr of clean aluminum or zinc, with a maximum flux rate during aluminum melt of 0.97 lbs/hr, equipped with no control, and with emissions exhausting indoors.
 - (5) One (1) natural gas-fired reverberatory aluminum and zinc melting and holding furnace, identified as V41-05, approved for construction in 2012, rated at 2.4 MMBtu/hr, with a maximum capacity of 1,000 lbs/hr of clean aluminum or zinc, with a maximum flux rate during aluminum melt of 0.97 lbs/hr, equipped with no control, and with emissions exhausting indoors.

- (6) One (1) natural gas-fired reverberatory aluminum and zinc melting and holding furnace, identified as V41-06, approved for construction in 2012, rated at 2.4 MMBtu/hr, with a maximum capacity of 1,200 lbs/hr of clean aluminum or zinc, with a maximum flux rate during aluminum melt of 1.16 lbs/hr, equipped with no control, and with emissions exhausting indoors.

Note: The maximum flux throughput for each furnace is 4.31 lb/ton of scrap, which is equivalent to 6.40 pounds of flux per hour total for all six (6) furnaces. The HF flux is used during aluminum melt only.

- (b) One (1) hydrogen fluoride fluxing operation, constructed in 2011, maximum throughput of 4.31 lbs hydrogen fluoride per ton of aluminum scrap (56,067 lbs of hydrogen fluoride per year), with no control, emissions exhausting indoors. HF fluxing occurs in each of the six (6) aluminum and zinc melting and holding furnaces.

- (c) Dross handling operations, with a maximum process weight rate of 0.10 tons per hour.

Note: The dross is manually skimmed from the melting furnace and the holding pot, and is sent to outside facility.

- (d) Seven (7) enclosed aluminum and zinc die casting processes, consisting of the following:

- (1) One (1) enclosed aluminum and zinc die casting processes, identified 41-01, constructed in 2011, with a maximum capacity of 1,200 pounds per hour of clean aluminum or zinc, using no control, and exhausting indoors.

- (2) One (1) enclosed aluminum and zinc die casting processes, identified 41-02, constructed in 2011, with a maximum capacity of 1,000 pounds per hour of clean aluminum or zinc, using no control, and exhausting indoors.

- (3) One (1) enclosed aluminum and zinc die casting processes, identified 41-03, constructed in 2012, with a maximum capacity of 1,200 pounds per hour of clean aluminum or zinc, using no control, and exhausting indoors.

- (4) One (1) enclosed aluminum and zinc die casting processes, identified 41-04, approved for construction in 2012, with a maximum capacity of 1,000 pounds per hour of clean aluminum or zinc, using no control, and exhausting indoors.

- (5) One (1) enclosed aluminum and zinc die casting processes, identified 41-05, approved for construction in 2012, with a maximum capacity of 1,000 pounds per hour of clean aluminum or zinc, using no control, and exhausting indoors.

- (6) One (1) enclosed aluminum and zinc die casting processes, identified 41-06a, approved for construction in 2012, with a maximum capacity of 1,200 pounds per hour of clean aluminum or zinc, using no control, and exhausting indoors.

- (7) One (1) enclosed aluminum and zinc die casting processes, identified 41-06b, approved for construction in 2012, with a maximum capacity of 1,200 pounds per hour of clean aluminum or zinc, using no control, and exhausting indoors.

- (e) One (1) totally enclosed mechanical blasting unit, identified as Shot Blast 5141, constructed in 2012, using steel shot, with a maximum blast rate of 129,600 pounds per hour and a maximum non-recycled media usage rate of 35 pounds per hour, with a maximum process weight rate of 3,600 pounds per hour of aluminum or zinc parts, using a dust collector, identified as 41-15, as control, and exhausting to stack V41-15.

- (f) One natural gas-fired air make-up unit, identified as MUA 5154, approved for construction in 2012, with a maximum heat input capacity of 3.50 MMBtu/hr, using no control, and exhausting indoors.

SECTION B

GENERAL CONDITIONS

B.1 Definitions [326 IAC 2-1.1-1]

Terms in this registration shall have the definition assigned to such terms in the referenced regulation. In the absence of definitions in the referenced regulation, the applicable definitions found in the statutes or regulations (IC 13-11, 326 IAC 1-2 and 326 IAC 2-1.1-1) shall prevail.

B.2 Effective Date of Registration [IC 13-15-5-3]

Pursuant to IC 13-15-5-3, this registration is effective immediately, unless a petition for stay of effectiveness is filed and granted according to IC 13-15-6-3, and may be revoked or modified in accordance with the provisions of IC 13-15-7-1.

B.3 Registration Revocation [326 IAC 2-1.1-9]

Pursuant to 326 IAC 2-1.1-9 (Revocation), this registration to operate may be revoked for any of the following causes:

- (a) Violation of any conditions of this registration.
- (b) Failure to disclose all the relevant facts, or misrepresentation in obtaining this registration.
- (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 registration shall not require revocation of this registration.
- (d) For any cause which establishes in the judgment of IDEM the fact that continuance of this registration is not consistent with purposes of this article.

B.4 Prior Permits Superseded [326 IAC 2-1.1-9.5]

- (a) All terms and conditions of permits established prior to Registration No. 075-32440-00034 and issued pursuant to permitting programs approved into the state implementation plan have been either:
 - (1) incorporated as originally stated,
 - (2) revised, or
 - (3) deleted.
- (b) All previous registrations and permits are superseded by this registration.

B.5 Annual Notification [326 IAC 2-5.1-2(f)(3)] [326 IAC 2-5.5-4(a)(3)]

Pursuant to 326 IAC 2-5.1-2(f)(3) and 326 IAC 2-5.5-4(a)(3):

- (a) An annual notification shall be submitted by an authorized individual to the Office of Air Quality stating whether or not the source is in operation and in compliance with the terms and conditions contained in this registration.
- (b) The annual notice shall be submitted in the format attached no later than March 1 of each year to:

Indiana Department of Environmental Management
Compliance and Enforcement Branch, Office of Air Quality
100 North Senate Avenue
MC 61-53 IGCN 1003

Indianapolis, IN 46204-2251

- (c) The notification shall be considered timely if the date postmarked on the envelope or certified mail receipt, or affixed by the shipper on the private shipping receipt, is on or before the date it is due. If the document is submitted by any other means, it shall be considered timely if received by IDEM, OAQ on or before the date it is due.

B.6 Source Modification Requirement [326 IAC 2-5.5-6(a)]

Pursuant to 326 IAC 2-5.5-6(a), an application or notification shall be submitted in accordance with 326 IAC 2 to the Office of Air Quality (OAQ) if the source proposes to construct new emission units, modify existing emission units, or otherwise modify the source.

B.7 Registrations [326 IAC 2-5.1-2(i)]

Pursuant to 326 IAC 2-5.1-2(i), this registration does not limit the source's potential to emit.

B.8 Preventive Maintenance Plan [326 IAC 1-6-3]

- (a) If required by specific condition(s) in Section D of this registration, the Registrant shall prepare and maintain Preventive Maintenance Plans (PMPs) no later than ninety (90) days after issuance of this registration or ninety (90) days after initial start-up, whichever is later, including the following information on each facility:

- (1) Identification of the individual(s) responsible for inspecting, maintaining, and repairing emission control devices;
- (2) A description of the items or conditions that will be inspected and the inspection schedule for said items or conditions; and
- (3) Identification and quantification of the replacement parts that will be maintained in inventory for quick replacement.

If, due to circumstances beyond the Registrant's control, the PMPs cannot be prepared and maintained within the above time frame, the Registrant may extend the date an additional ninety (90) days provided the Registrant notifies:

Indiana Department of Environmental Management
Compliance and Enforcement Branch, Office of Air Quality
100 North Senate Avenue
MC 61-53 IGCN 1003
Indianapolis, Indiana 46204-2251

The Registrant shall implement the PMPs.

- (b) A copy of the PMPs shall be submitted to IDEM, OAQ upon request and within a reasonable time, and shall be subject to review and approval by IDEM, OAQ. IDEM, OAQ may require the Registrant to revise its PMPs whenever lack of proper maintenance causes or is the primary contributor to an exceedance of any limitation on emissions.
- (c) To the extent the Registrant is required by 40 CFR Part 60 or 40 CFR Part 63 to have an Operation Maintenance, and Monitoring (OMM) Plan for a unit, such OMM Plan is deemed to satisfy the PMP requirements of 326 IAC 1-6-3 for that unit.

SECTION C

SOURCE OPERATION CONDITIONS

Entire Source

Emission Limitations and Standards [326 IAC 2-5.1-2(g)] [326 IAC 2-5.5-4(b)]

C.1 Opacity [326 IAC 5-1]

Pursuant to 326 IAC 5-1-2 (Opacity Limitations), except as provided in 326 IAC 5-1-3 (Temporary Alternative Opacity Limitations), opacity shall meet the following, unless otherwise stated in this registration:

- (a) Opacity shall not exceed an average of forty percent (40%) in any one (1) six (6) minute averaging period as determined in 326 IAC 5-1-4.
- (b) Opacity shall not exceed sixty percent (60%) for more than a cumulative total of fifteen (15) minutes (sixty (60) readings as measured according to 40 CFR 60, Appendix A, Method 9 or fifteen (15) one (1) minute nonoverlapping integrated averages for a continuous opacity monitor) in a six (6) hour period.

C.2 Fugitive Dust Emissions [326 IAC 6-4]

The Registrant shall not allow fugitive dust to escape beyond the property line or boundaries of the property, right-of-way, or easement on which the source is located, in a manner that would violate 326 IAC 6-4 (Fugitive Dust Emissions).

SECTION D.1

OPERATION CONDITIONS

Facility Description [326 IAC 2-5.1-2(f)(2)] [326 IAC 2-5.5-4(a)(2)]:

- (a) Six (6) natural gas-fired reverberatory aluminum and zinc melting and holding furnaces, consisting of the following:
- (1) One (1) natural gas-fired reverberatory aluminum and zinc melting and holding furnace, identified as V41-01, constructed in 2011, rated at 2.4 MMBtu/hr, with a maximum capacity of 1,200 lbs/hr of clean aluminum or zinc, with a maximum flux rate during aluminum melt of 1.16 lbs/hr, equipped with no control, and with emissions exhausting indoors
 - (2) One (1) natural gas-fired reverberatory aluminum and zinc melting and holding furnace, identified as V41-02, constructed in 2011, rated at 2.4 MMBtu/hr, with a maximum capacity of 1,000 lbs/hr of clean aluminum or zinc, with a maximum flux rate during aluminum melt of 0.97 lbs/hr, equipped with no control, and with emissions exhausting indoors
 - (3) One (1) natural gas-fired reverberatory aluminum and zinc melting and holding furnace, identified as V41-03, constructed in 2012, rated at 2.4 MMBtu/hr, with a maximum capacity of 1,200 lbs/hr of clean aluminum or zinc, with a maximum flux rate during aluminum melt of 1.16 lbs/hr, equipped with no control, and with emissions exhausting indoors
 - (4) One (1) natural gas-fired reverberatory aluminum and zinc melting and holding furnace, identified as V41-04, approved for construction in 2012, rated at 2.4 MMBtu/hr, with a maximum capacity of 1,000 lbs/hr of clean aluminum or zinc, with a maximum flux rate during aluminum melt of 0.97 lbs/hr, equipped with no control, and with emissions exhausting indoors.
 - (5) One (1) natural gas-fired reverberatory aluminum and zinc melting and holding furnace, identified as V41-05, approved for construction in 2012, rated at 2.4 MMBtu/hr, with a maximum capacity of 1,000 lbs/hr of clean aluminum or zinc, with a maximum flux rate during aluminum melt of 0.97 lbs/hr, equipped with no control, and with emissions exhausting indoors.
 - (6) One (1) natural gas-fired reverberatory aluminum and zinc melting and holding furnace, identified as V41-06, approved for construction in 2012, rated at 2.4 MMBtu/hr, with a maximum capacity of 1,200 lbs/hr of clean aluminum or zinc, with a maximum flux rate during aluminum melt of 1.16 lbs/hr, equipped with no control, and with emissions exhausting indoors.
- Note: The maximum flux throughput for each furnace is 4.31 lb/ton of scrap, which is equivalent to 6.40 pounds of flux per hour total for all six (6) furnaces. The HF flux is used during aluminum melt only.
- (b) One (1) hydrogen fluoride fluxing operation, constructed in 2011, maximum throughput of 4.31 lbs hydrogen fluoride per ton of aluminum scrap (56,067 lbs of hydrogen fluoride per year), with no control, emissions exhausting indoors. HF fluxing occurs in each of the six (6) aluminum and zinc melting and holding furnaces.

(c)	Dross handling operations, with a maximum process weight rate of 0.10 tons per hour.
Note:	The dross is manually skimmed from the melting furnace and the holding pot, and is sent to outside facility.
(d)	Seven (7) enclosed aluminum and zinc die casting processes, consisting of the following:
(1)	One (1) enclosed aluminum and zinc die casting processes, identified 41-01, constructed in 2011, with a maximum capacity of 1,200 pounds per hour of clean aluminum or zinc, using no control, and exhausting indoors.
(2)	One (1) enclosed aluminum and zinc die casting processes, identified 41-02, constructed in 2011, with a maximum capacity of 1,000 pounds per hour of clean aluminum or zinc, using no control, and exhausting indoors.
(3)	One (1) enclosed aluminum and zinc die casting processes, identified 41-03, constructed in 2012, with a maximum capacity of 1,200 pounds per hour of clean aluminum or zinc, using no control, and exhausting indoors.
(4)	One (1) enclosed aluminum and zinc die casting processes, identified 41-04, approved for construction in 2012, with a maximum capacity of 1,000 pounds per hour of clean aluminum or zinc, using no control, and exhausting indoors.
(5)	One (1) enclosed aluminum and zinc die casting processes, identified 41-05, approved for construction in 2012, with a maximum capacity of 1,000 pounds per hour of clean aluminum or zinc, using no control, and exhausting indoors.
(6)	One (1) enclosed aluminum and zinc die casting processes, identified 41-06a, approved for construction in 2012, with a maximum capacity of 1,200 pounds per hour of clean aluminum or zinc, using no control, and exhausting indoors.
(7)	One (1) enclosed aluminum and zinc die casting processes, identified 41-06b, approved for construction in 2012, with a maximum capacity of 1,200 pounds per hour of clean aluminum or zinc, using no control, and exhausting indoors.
(e)	One (1) totally enclosed mechanical blasting unit, identified as Shot Blast 5141, constructed in 2012, using steel shot, with a maximum blast rate of 129,600 pounds per hour and a maximum non-recycled media usage rate of 35 pounds per hour, with a maximum process weight rate of 3,600 pounds per hour of aluminum or zinc parts, using a dust collector, identified as 41-15, as control, and exhausting to stack V41-15.
(f)	One natural gas-fired air make-up unit, identified as MUA 5154, approved for construction in 2012, with a maximum heat input capacity of 3.50 MMBtu/hr, using no control, and exhausting indoors.
(The information describing the process contained in this emissions unit description box is descriptive information and does not constitute enforceable conditions.)	

Emission Limitations and Standards [326 IAC 2-5.1-2(f)(1)] [326 IAC 2-5.5-4(a)(1)]

D.1.1 Particulate Matter [326 IAC 6-3-2]

- (a) Pursuant to 326 IAC 6-3-2(e) (Particulate Emission Limitations for Manufacturing Processes), the allowable particulate emission rate from the each of the melting furnaces shall not exceed the pound per hour limit in the following table:

Emission Unit	Aluminum or Zinc Process Weight Rate (lb/hr)	Flux Rate (during aluminum melt only) (lb/hr)	Total Throughput Metal + Flux (ton/hr)	Allowable PM Emissions (lb/hr)
Furnace V41-01	1,200	1.16	0.6006	2.91
Furnace V41-02	1,000	0.97	0.5005	2.58
Furnace V41-03	1,200	1.16	0.6006	2.91
Furnace V41-04	1,000	0.97	0.5005	2.58
Furnace V41-05	1,000	0.97	0.5005	2.58
Furnace V41-06	1,200	1.16	0.6006	2.91

The above pounds per hour limitations were calculated with the following equation:

Interpolation 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:

$$E = 4.10 P^{0.67} \quad \text{where } E = \text{rate of emission in pounds per hour and} \\ P = \text{process weight rate in tons per hour}$$

- (b) Pursuant to 326 IAC 6-3-2(e) (Particulate Emission Limitations for Manufacturing Processes), the allowable particulate emission rate from the blasting unit shall not exceed 68.31 pounds per hour when operating at a process weight rate of 133,200 pounds per hour.

The above pound per hour limitation was calculated with the following equation:

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

$$E = 55.0 * P^{0.11} - 40 \quad \text{where } E = \text{rate of emission in pounds per hour and} \\ P = \text{process weight rate in tons per hour}$$

D.1.2 Material Usage [40 CFR 63, Subpart RRR]

When melting aluminum, the Permittee shall only melt clean aluminum ingots, or internal scrap or customer returns in the aluminum foundry as defined under 40 CFR 63.1503. Therefore, the requirements of 40 CFR 63, Subpart RRR (Secondary Aluminum Production) do not apply.

D.1.3 Preventive Maintenance Plan

A Preventive Maintenance Plan is required for these facilities. Section B - Preventive Maintenance Plan contains the Permittee's obligation with regard to the preventive maintenance plan required by this condition.

**INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF AIR QUALITY
COMPLIANCE AND ENFORCEMENT BRANCH**

**REGISTRATION
ANNUAL NOTIFICATION**

This form should be used to comply with the notification requirements under 326 IAC 2-5.1-2(f)(3) and 326 IAC 2-5.5-4(a)(3).

Company Name:	Fort Recovery Industries, Inc.
Address:	710 East 100 North
City:	Portland, Indiana 47371
Phone Number:	419-375-4121
Registration No.:	075-32440-00034

I hereby certify that Fort Recovery Industries, Inc. is:

- still in operation.
- no longer in operation.
- in compliance with the requirements of Registration No. 075-32440-00034.
- not in compliance with the requirements of Registration No. 075-32440-00034.

I hereby certify that Fort Recovery Industries, Inc. is:

Authorized Individual (typed):
Title:
Signature:
Phone Number:
Date:

If there are any conditions or requirements for which the source is not in compliance, provide a narrative description of how the source did or will achieve compliance and the date compliance was, or will be achieved.

Noncompliance:

**Indiana Department of Environmental Management
Office of Air Quality**

Technical Support Document (TSD) for a Registration

Source Description and Location

Source Name:	Fort Recovery Industries, Inc.
Source Location:	710 East 100 North, Portland, Indiana 47371
County:	Jay
SIC Code:	3363 (Aluminum Die-castings)
Registration No.:	M075-32440-00034
Permit Reviewer:	Sarah Street

On October 22, 2012, the Office of Air Quality (OAQ) received an application from Fort Recovery Industries, Inc. related to a modification to an existing aluminum molding and die casting plant and to the change in permit from MSOP to Registration. In addition to the construction approval for new emission units, the source has requested to revised the potential to emit calculations (see details below). Due to the revision of emissions calculations, this source has requested to be issued a Registration.

Existing Approvals

The source was issued MSOP No. M075-30379-00034 on July 20, 2011. The source has since received Notice-Only Change No. M075-32032-00034, issued on August 2, 2012.

Due to this application, this source will be issued a Registration.

County Attainment Status

The source is located in Jay County.

Pollutant	Designation
SO ₂	Better than national standards.
CO	Unclassifiable or attainment effective November 15, 1990.
O ₃	Unclassifiable or attainment effective June 15, 2004, for the 8-hour ozone standard. ¹
PM ₁₀	Unclassifiable effective November 15, 1990.
NO ₂	Cannot be classified or better than national standards.
Pb	Not designated.
¹ Unclassifiable or attainment effective October 18, 2000, for the 1-hour ozone standard which was revoked effective June 15, 2005. Unclassifiable or attainment effective April 5, 2005, for PM _{2.5} .	

- (a) **Ozone Standards**
 Volatile organic compounds (VOC) and Nitrogen Oxides (NOx) are regulated under the Clean Air Act (CAA) for the purposes of attaining and maintaining the National Ambient Air Quality Standards (NAAQS) for ozone. Therefore, VOC and NOx emissions are considered when evaluating the rule applicability relating to ozone. Jay County has been designated as attainment or unclassifiable for ozone. Therefore, VOC and NOx emissions were reviewed pursuant to the requirements for Prevention of Significant Deterioration (PSD), 326 IAC 2-2.

- (b) **PM_{2.5}**
 Jay County has been classified as attainment for PM_{2.5}. On May 8, 2008 U.S. EPA promulgated the requirements for Prevention of Significant Deterioration (PSD) for PM_{2.5} emissions. These

rules became effective on July 15, 2008. On May 4, 2011 the air pollution control board issued an emergency rule establishing the direct PM_{2.5} significant level at ten (10) tons per year. This rule became effective, June 28, 2011. Therefore, direct PM_{2.5} and SO₂ emissions were reviewed pursuant to the requirements for Prevention of Significant Deterioration (PSD), 326 IAC 2-2. See the State Rule Applicability – Entire Source section.

- (c) Other Criteria Pollutants
Jay County has been classified as attainment or unclassifiable in Indiana for all other criteria pollutants. Therefore, these emissions were reviewed pursuant to the requirements for Prevention of Significant Deterioration (PSD), 326 IAC 2-2.

Fugitive Emissions

- (a) The fugitive emissions of criteria pollutants, hazardous air pollutants, and greenhouse gases are counted toward the determination of 326 IAC 2-6.1 (Minor Source Operating Permits) applicability.
- (b) Since this type of operation is not one of the twenty-eight (28) listed source categories under 326 IAC 2-2, 326 IAC 2-3, or 326 IAC 2-7, and there is no applicable New Source Performance Standard that was in effect on August 7, 1980, fugitive emissions are not counted toward the determination of PSD, Emission Offset, and Part 70 Permit applicability.

Note: This source only uses aluminum and zinc ingots and is not primarily engaged in the metal recovery process. Therefore, this source is not considered a “secondary metal production plant” and is not in 1 of 28 source categories, as defined in 326 IAC 2-2-1(y), for the PSD regulations.

Background and Description of Emission Units and Pollution Control Equipment

The Office of Air Quality (OAQ) has reviewed an application, submitted by Fort Recovery Industries, Inc. on October 22, 2012, relating to the following:

- (a) The addition of three new melting furnace and die cast operations.
- (b) The revision of potential to emit (PTE) calculations for existing melting furnace and die cast operations, based upon the following information:
- (1) The maximum throughput capacity of Melting Furnace 41-02/Die Cast 2 is 1,000 pounds/hour and not 1,200 pounds/hour. In prior permit application for New Source Construction and MSOP No. 075-30379-00034, issued July 20, 2011, the maximum capacity of this furnace was incorrectly identified. The maximum capacity will be corrected with this Registration.
 - (2) Emission factors for PM have been updated to use the appropriate factor for melting clean metal. It has been correctly identified in prior permit approvals that the existing melting furnaces melt only clean metal; however, the emission factor previously used for particulate matter was for melting contaminated metal. Emission factors are from the STAPPA/ALAPCO Handbook, Section 11. These updated emission factors will also be used to calculate emissions from the three new melting furnaces.
 - (3) The emission factor for VOCs has been updated to use the factor for melting from zinc melting reverberatory furnaces. This factor is considered a worst-case scenario since the furnaces have the capability of melting either aluminum or zinc, and the emission factor for VOC from zinc melting is higher than for aluminum melting. With this Registration, the unit descriptions for the melting furnaces will indicate these furnaces can melt zinc or aluminum.

- (4) Prior emissions calculations identified emissions from HF fluxing as both HAPs and particulate emissions; this is incorrect and will be updated with this permit revision. HF fluxing emissions should be represented as HAPs emissions only; the particulate emissions from fluxing are accounted for already in the melting PTE calculations.

See Appendix A for detailed emissions calculations.

- (c) Revisions to the following descriptive information:

- (1) The construction date for Furnace 41-03/Die Cast 3 was 2012 and not 2011, as listed in the current operating permit.
- (2) The source is requesting that all melting furnace and die cast operations be permitted to melt either aluminum or zinc, for flexibility of production. The emission unit descriptions will be updated to indicate these units can melt zinc or aluminum. As noted above, emissions calculations will be based on the worst case scenario for each pollutant. See Appendix A for calculations.
- (3) The source has altered the stack identification for emission unit Shot Blast 5141.

- (d) The addition of the existing dross handling operation to the Potential to Emit calculations. Prior permit approvals have indicated this source has dross handling operations, but no emissions calculations have been included and the operation has not been listed in the permit. With this Registration, the dross handling operation will now be included.

The source consists of the following existing emission unit(s):

- (a) One (1) natural gas-fired reverberatory aluminum and zinc melting and holding furnace, identified as V41-01, constructed in 2011, rated at 2.4 MMBtu/hr, with a maximum capacity of 1,200 lbs/hr of clean aluminum or zinc, with a maximum flux rate during aluminum melt of 1.16 lbs/hr, equipped with no control, and with emissions exhausting indoors.
- (b) One (1) natural gas-fired reverberatory aluminum and zinc melting and holding furnace, identified as V41-02, constructed in 2011, rated at 2.4 MMBtu/hr, with a maximum capacity of 1,000 lbs/hr of clean aluminum or zinc, with a maximum flux rate during aluminum melt of 0.97 lbs/hr, equipped with no control, and with emissions exhausting indoors.
- (c) One (1) natural gas-fired reverberatory aluminum and zinc melting and holding furnace, identified as V41-03, constructed in 2012, rated at 2.4 MMBtu/hr, with a maximum capacity of 1,200 lbs/hr of clean aluminum or zinc, with a maximum flux rate during aluminum melt of 1.16 lbs/hr, equipped with no control, and with emissions exhausting indoors.
- (d) One (1) hydrogen fluoride fluxing operation, constructed in 2011, maximum throughput of 4.31 lbs hydrogen fluoride per ton of aluminum scrap (56,067 lbs of hydrogen fluoride per year), with no control, emissions exhausting indoors. HF fluxing occurs in each of the six (6) aluminum and zinc melting and holding furnaces.
- (e) One (1) enclosed aluminum and zinc die casting processes, identified 41-01, constructed in 2011, with a maximum capacity of 1,200 pounds per hour of clean aluminum or zinc, using no control, and exhausting indoors.
- (f) One (1) enclosed aluminum and zinc die casting processes, identified 41-02, constructed in 2011, with a maximum capacity of 1,000 pounds per hour of clean aluminum or zinc, using no control, and exhausting indoors.

- (g) One (1) enclosed aluminum and zinc die casting processes, identified 41-03, constructed in 2012, with a maximum capacity of 1,200 pounds per hour of clean aluminum or zinc, using no control, and exhausting indoors.
- (h) One (1) totally enclosed mechanical blasting unit, identified as Shot Blast 5141, constructed in 2012, using steel shot, with a maximum blast rate of 129,600 pounds per hour and a maximum non-recycled media usage rate of 35 pounds per hour, with a maximum process weight rate of 3,600 pounds per hour of aluminum or zinc parts, using a dust collector, identified as 41-15, as control, and exhausting to stack V41-15.
- (i) One natural gas-fired air make-up unit, identified as MUA 5154, approved for construction in 2012, with a maximum heat input capacity of 3.50 MMBtu/hr, using no control, and exhausting indoors.

The following is a list of the new emission unit(s) and pollution control device(s):

- (a) One (1) natural gas-fired reverberatory aluminum and zinc melting and holding furnace, identified as V41-04, approved for construction in 2012, rated at 2.4 MMBtu/hr, with a maximum capacity of 1,000 lbs/hr of clean aluminum or zinc, with a maximum flux rate during aluminum melt of 0.97 lbs/hr, equipped with no control, and with emissions exhausting indoors.
- (b) One (1) natural gas-fired reverberatory aluminum and zinc melting and holding furnace, identified as V41-05, approved for construction in 2012, rated at 2.4 MMBtu/hr, with a maximum capacity of 1,000 lbs/hr of clean aluminum or zinc, with a maximum flux rate during aluminum melt of 0.97 lbs/hr, equipped with no control, and with emissions exhausting indoors.
- (c) One (1) natural gas-fired reverberatory aluminum and zinc melting and holding furnace, identified as V41-06, approved for construction in 2012, rated at 2.4 MMBtu/hr, with a maximum capacity of 1,200 lbs/hr of clean aluminum or zinc, with a maximum flux rate during aluminum melt of 1.16 lbs/hr, equipped with no control, and with emissions exhausting indoors.
- (d) Dross handling operations, with a maximum process weight rate of 0.10 tons per hour.

Note: The dross is manually skimmed from the melting furnace and the holding pot, and is sent to outside facility.
- (e) One (1) enclosed aluminum and zinc die casting processes, identified 41-04, approved for construction in 2012, with a maximum capacity of 1,000 pounds per hour of clean aluminum or zinc, using no control, and exhausting indoors.
- (f) One (1) enclosed aluminum and zinc die casting processes, identified 41-05, approved for construction in 2012, with a maximum capacity of 1,000 pounds per hour of clean aluminum or zinc, using no control, and exhausting indoors.
- (g) One (1) enclosed aluminum and zinc die casting processes, identified 41-06a, approved for construction in 2012, with a maximum capacity of 1,200 pounds per hour of clean aluminum or zinc, using no control, and exhausting indoors.
- (h) One (1) enclosed aluminum and zinc die casting processes, identified 41-06b, approved for construction in 2012, with a maximum capacity of 1,200 pounds per hour of clean aluminum or zinc, using no control, and exhausting indoors.

Notes:

- (1) The aluminum melters/furnaces are a component of the integrated molding operation. Mold release is water based silicon. There are no emissions from this process.
- (2) HF is used for wall cleaning to remove oxide build up to the melting and/or holding units when adding gates and returns. The amount of flash and returns (based on the similar operation at Fort Recovery Industries in Fort Recovery, Ohio operation) is estimated to be 45% of the aluminum melted. Please see TSD Appendix A for emission calculations.
- (3) There are no emissions from the pouring and cooling operations because the die casting process is an enclosed molding process.

Enforcement Issues

There are no pending enforcement actions related to this revision.

Emission Calculations

See Appendix A of this TSD for detailed emission calculations.

Emission factors for particulate matter have been updated to use the appropriate factor for melting clean metal (aluminum or zinc). It has been correctly identified in prior permit approvals that the melting furnaces melt only clean metal; however, the emission factor previously used for particulate matter was for melting contaminated metal. Emission factors are from the STAPPA/ALAPCO Handbook, Section 11. Emission factors for VOCs have been updated to use factors for melting from zinc melting reverberatory furnaces; this factor is considered a worst-case scenario, as the furnaces can melt either zinc or aluminum.

Permit Level Determination – Registration

The following table reflects the unlimited potential to emit (PTE) of the entire source before controls. Control equipment is not considered federally enforceable until it has been required in a federally enforceable permit.

Process/ Emission Unit	Potential To Emit of the Entire Source (tons/year)									
	PM	PM10*	PM2.5	SO ₂	NO _x	VOC	CO	GHGs as CO ₂ e**	Total HAPs	Worst Single HAP
Furnaces ⁽¹⁾	16.03	16.39	16.39	0.04	6.31	3.24	5.30	7,615	2.75	2.69 HF
Die casting units ⁽²⁾	0.58	0.58	0.58	-	-	-	-	-	-	-
Dross Handling	0.48	0.48	0.48	-	-	-	-	-	-	-
Blasting unit	0.61	0.53	0.53	-	-	-	-	-	-	-
Natural Gas-Fired Air Make-Up Unit	0.03	0.11	0.11	0.01	1.50	0.08	1.26	1,815	0.03	0.03 Hexane
Fugitive Emissions (Roads)	0.83	0.19	0.03	-	-	-	-	-	-	-
Total PTE of Entire Source	18.56	18.29	18.12	0.05	7.81	3.32	6.56	9,429	2.78	2.69 HF
Registration Levels**	25	25	25	25	25	25	100	100,000	25	10

negl. = negligible
 (1) Emissions from the furnaces include combustion, melting, and fluxing processes.
 (2) There is no pouring and cooling casting processes involved with the die casting process.
 *Under the Part 70 Permit program (40 CFR 70), particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers (PM10), not particulate matter (PM), is considered as a "regulated air pollutant".
 **The 100,000 CO₂e threshold represents the Title V and PSD subject to regulation thresholds for GHGs in order to determine whether a source's emissions are a regulated NSR pollutant under Title V and PSD.

- (a) The potential to emit (PTE) (as defined in 326 IAC 2-1.1-1) of PM, PM10, and PM2.5 are within the ranges listed in 326 IAC 2-5.5-1(b)(1). The PTE of all other regulated criteria pollutants are less than the ranges listed in 326 IAC 2-5.5-1(b)(1). Therefore, the source is subject to the provisions of 326 IAC 2-5.5 (Registrations). A Registration will be issued.
- (b) The potential to emit (PTE) (as defined in 326 IAC 2-1.1-1) of any single HAP is less than ten (10) tons per year and the PTE of a combination of HAPs is less than twenty-five (25) tons per year. Therefore, this source is an area source under Section 112 of the Clean Air Act (CAA) and not subject to the provisions of 326 IAC 2-7.
- (c) The potential to emit (PTE) (as defined in 326 IAC 2-1.1-1) greenhouse gases (GHGs) is less than the Title V subject to regulation threshold of one hundred thousand (100,000) tons of CO₂ equivalent emissions (CO₂e) per year. Therefore, the source is not subject to the provisions of 326 IAC 2-7.

Federal Rule Applicability Determination

New Source Performance Standards (NSPS)

- (a) Standards of Performance for Primary Aluminum Reduction Plants (40 CFR Part 60, Subpart S)
 This source does not manufacture aluminum; therefore, pursuant to 40 CFR 60.190 and 40 CFR 60.191, the requirements of this Subpart do not apply to this source.
- (b) There are no New Source Performance Standards (NSPS) (326 IAC 12 and 40 CFR Part 60) included for this Registration.

National Emission Standards for Hazardous Air Pollutants (NESHAP)

- (c) National Emission Standard for Hazardous Air Pollutants for Primary Aluminum Reduction Plants (40 CFR Part 63, Subpart LL)

The requirements of NESHAP Subpart LL, are not included in the permit, pursuant to 40 CFR 63.840 and 40 CFR 63.842, because the source does not manufacture aluminum.

- (d) National Emission Standards of Hazardous Air Pollutants for Secondary Aluminum Production (40 CFR Part 63, Subpart RRR (3R))

The provisions of NESHAP Subpart RRR are not included in this permit for this aluminum die casting plant because, pursuant to 40 CFR 63.1500(f), the requirements of this subpart do not apply to manufacturers of aluminum die castings, aluminum foundries, or aluminum extruders that melt no materials other than clean charge and materials generated within the facility; and that also do not operate a thermal chip dryer, sweat furnace or scrap dryer/delacquering kiln/decoating kiln. This source melts clean charge, and has no new or existing secondary aluminum processing unit, containing one or more group 1 furnace emission units processing other than clean charge, therefore, the requirements of this rule do not apply.

Note 1: When melting aluminum, the Permittee shall only melt clean aluminum ingots, or internal scrap or customer returns in the aluminum foundry as defined under 40 CFR 63.1503. Therefore, the requirements of 40 CFR 63, Subpart RRR (Secondary Aluminum Production) do not apply.

Note 2: The Permittee may also melt zinc.

- (e) National Emission Standards for Hazardous Air Pollutants for Iron and Steel Foundries (40 CFR Part 63 Subpart EEEEE (5E))

This source is not subject to the requirements of NESHAP Subpart EEEEE because, pursuant to 40 CFR 63.7680, this subpart applies to each new or existing iron and steel foundry that is a major source of HAPs. This source is not a major source of HAPs and is not an iron and steel foundry; therefore, this source is not subject to the requirements of this rule.

- (f) National Emission Standard for Hazardous Air Pollutants for Area/Sources: Electric Arc Furnace Steelmaking Facilities (40 CFR Part 63 Subpart YYYYY (5Y))

This source is not subject to the requirements of the NESHAP Subpart YYYYY, pursuant to 40 CFR 63.10680, because this source is does not own or operate an electric arc furnace (EAF) steelmaking facility, as defined in 40 CFR 63.10692.

- (g) National Emission Standard for Hazardous Air Pollutants for Iron and Steel Foundries Area Sources (40 CFR Part 63, Subpart ZZZZZ (5Z))

This source is not subject to the requirements of NESHAP Subpart ZZZZZ, pursuant to 40 CFR 63.10880 and 40 CFR 63.10906, because this source does not operate an iron and steel foundry.

- (h) National Emission Standards for Hazardous Air Pollutants for Primary Nonferrous Metals Area Sources—Zinc, Cadmium, and Beryllium (40 CFR Part 63, Subpart GGGGGG (6G))

This source is not subject to the requirements of NESHAP Subpart GGGGGG, pursuant to 40 CFR 63.11160 and 40 CFR 63.11167, because this source is not a primary zinc production facility.

Primary zinc production facility means an installation engaged in the production, or any intermediate process in the production, of zinc or zinc oxide from zinc sulfide ore concentrates through the use of pyrometallurgical techniques.

- (i) National Emission Standards for Hazardous Air Pollutants for Secondary Nonferrous Metals Processing Area Sources (40 CFR Part 63, Subpart TTTTTT (6T))

This source is not subject to the requirements of NESHAP Subpart TTTTTT, pursuant to 40 CFR 63.11462 and the definitions in 40 CFR 63.11472, because this source does meet the definition of a secondary nonferrous metals processing facility.

Secondary nonferrous metals processing facility means a brass and bronze ingot making, secondary magnesium processing, or secondary zinc processing plant that uses furnace melting operations to melt post-consumer nonferrous metal scrap to make products including bars, ingots, blocks, or metal powders.

This source only uses aluminum and zinc ingots and is not primarily engaged in the metal recovery process. Therefore, this source is not considered a “secondary metal production plant.”

- (j) National Emission Standards for Hazardous Air Pollutants: Area Source Standards for Aluminum, Copper, and Other Nonferrous Foundries (40 CFR Part 63, Subpart ZZZZZZ (6Z))

This source is not subject to the requirements of NESHAP Subpart ZZZZZZ because this source does not use material containing aluminum foundry HAP, material containing copper foundry HAP, or material containing other nonferrous foundry HAP, as defined in 40 CFR 63.11556.

- (k) There are no National Emission Standards for Hazardous Air Pollutants (NESHAPs) (326 IAC 14, 326 IAC 20 and 40 CFR Part 63) included for this Registration.

Compliance Assurance Monitoring (CAM)

- (l) Pursuant to 40 CFR 64.2, Compliance Assurance Monitoring (CAM) is not included in the permit, because the unlimited potential to emit of the source is less than the Title V major source thresholds and the source is not required to obtain a Part 70 or Part 71 permit.

State Rule Applicability Determination

The following state rules are applicable to the source:

- (a) 326 IAC 2-5.5 (Registrations)
Registration applicability is discussed under the Permit Level Determination – Registration section above.
- (b) 326 IAC 2-4.1 (Major Sources of Hazardous Air Pollutants (HAP))
The potential to emit of any single HAP is less than ten (10) tons per year and the potential to emit of a combination of HAPs is less than twenty-five (25) tons per year. Therefore, this source is an area source under Section 112 of the Clean Air Act (CAA) and not subject to the provisions of 326 IAC 2-4.1.
- (c) 326 IAC 2-6 (Emission Reporting)
Pursuant to 326 IAC 2-6-1, this source is not subject to this rule, because it is not required to have an operating permit under 326 IAC 2-7 (Part 70), it is not located in Lake, Porter, or LaPorte County, and it does not emit lead into the ambient air at levels equal to or greater than 5 tons per year. Therefore, 326 IAC 2-6 does not apply.

- (d) 326 IAC 5-1 (Opacity Limitations)
 Pursuant to 326 IAC 5-1-2 (Opacity Limitations), except as provided in 326 IAC 5-1-3 (Temporary Alternative Opacity Limitations), opacity shall meet the following, unless otherwise stated in this permit:
 - (1) Opacity shall not exceed an average of forty percent (40%) in any one (1) six (6) minute averaging period as determined in 326 IAC 5-1-4.
 - (2) Opacity shall not exceed sixty percent (60%) for more than a cumulative total of fifteen (15) minutes (sixty (60) readings as measured according to 40 CFR 60, Appendix A, Method 9 or fifteen (15) one (1) minute nonoverlapping integrated averages for a continuous opacity monitor) in a six (6) hour period.
- (e) 326 IAC 6-4 (Fugitive Dust Emissions Limitations)
 Pursuant to 326 IAC 6-4 (Fugitive Dust Emissions Limitations), the source shall not allow fugitive dust to escape beyond the property line or boundaries of the property, right-of-way, or easement on which the source is located, in a manner that would violate 326 IAC 6-4.
- (f) 326 IAC 6-5 (Fugitive Particulate Matter Emission Limitations)
 The source is not subject to the requirements of 326 IAC 6-5, because the source does not have potential fugitive particulate emissions greater than 25 tons per year. Therefore, 326 IAC 6-5 does not apply.
- (g) 326 IAC 12 (New Source Performance Standards)
 See Federal Rule Applicability Section of this TSD.
- (h) 326 IAC 20 (Hazardous Air Pollutants)
 See Federal Rule Applicability Section of this TSD.

Reverberatory aluminum and zinc melting and holding furnaces

- (i) 326 IAC 6-2 (Particulate Emissions from Indirect Heating Units)
 The three (3) new and three (3) existing natural gas-fired reverberatory aluminum and zinc melting and holding furnaces are not subject to the requirements of 326 IAC 6-2 because these furnaces are not sources of indirect heating.
- (j) 326 IAC 6-3-2 (Particulate Emission Limitations for Manufacturing Processes)
 Pursuant to 326 IAC 6-3-2(e) (Particulate Emission Limitations for Manufacturing Processes), the allowable particulate emission rate from the each of the melting furnaces shall not exceed the pound per hour limit in the following table:

Emission Unit	Aluminum or Zinc Process Weight Rate (lb/hr)	Flux Rate (during aluminum melt only) (lb/hr)	Total Throughput Metal + Flux (ton/hr)	Allowable PM Emissions (lb/hr)
Furnace V41-01	1,200	1.16	0.6006	2.91
Furnace V41-02	1,000	0.97	0.5005	2.58
Furnace V41-03	1,200	1.16	0.6006	2.91
Furnace V41-04	1,000	0.97	0.5005	2.58
Furnace V41-05	1,000	0.97	0.5005	2.58
Furnace V41-06	1,200	1.16	0.6006	2.91

The above pounds per hour limitations for were calculated with the following equation:

Interpolation 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:

$E = 4.10 P^{0.67}$ where E = rate of emission in pounds per hour and
 P = process weight rate in tons per hour

Based on the emission factors in Appendix A, the following table shows a comparison of the allowable PM emission rate pursuant to 326 IAC 6-3-2 and the potential emissions:

Emission Unit	Total Throughput Metal + Flux (ton/hr)	Allowable PM Emissions (lb/hr)	Unlimited Potential Emissions (lb/hr)	Can Furnace Comply?
Furnace V41-04	0.5005	2.58	2.41	YES
Furnace V41-05	0.5005	2.58	2.41	YES
Furnace V41-06	0.6006	2.91	2.89	YES

Therefore, each melting furnace can comply with the requirements of 326 IAC 6-3-2.

- (k) 326 IAC 7-1 (Sulfur dioxide emission limitations: applicability)
 The three (3) new and three (3) existing natural gas-fired reverberatory aluminum and zinc melting and holding furnaces are not subject to the requirements of 326 IAC 7-1, because the potential and the actual emissions of sulfur dioxide are less than twenty-five (25) tons per year and ten (10) pounds per hour each.
- (l) 326 IAC 8-1-6 (VOC BACT Requirements)
 The three (3) new and three (3) existing natural gas-fired reverberatory aluminum and zinc melting and holding furnaces are not subject to the requirements of 326 IAC 8-1-6 (BACT) because the potential to emit VOCs from each unit is less than twenty-five (25) tons per year.
- (m) 326 IAC 8 (VOC Rules)
 There are no VOC Rules applicable to the three (3) new and three (3) existing natural gas-fired reverberatory aluminum and zinc melting and holding furnaces.

Die casting and dross handling operations

- (n) 326 IAC 6-3-2 (Particulate Emission Limitations for Manufacturing Processes)
 The potential particulate emissions from the new die casting and dross handling operations are each less than 0.551 pounds per hour, therefore, pursuant to 326 IAC 6-3-1(b)(14), the die casting dross handling/cooling operations are exempt from the requirements of 326 IAC 6-3.

Note: The dross is manually skimmed from the melting furnace and the holding pot, and is sent to outside facility.

Blasting unit

- (o) 326 IAC 6-3-2 (Particulate Emission Limitations for Manufacturing Processes)
 Pursuant to 326 IAC 6-3-2(e) (Particulate Emission Limitations for Manufacturing Processes), the allowable particulate emission rate from the blasting unit shall not exceed 68.31 pounds per hour when operating at a process weight rate of 133,200 pounds per hour.

The process weight rate is determined by the following:

Maximum shot blasted = 129,600 pounds per hour
 = 4 wheels x 540 lb/wheel/minute x 60 min/hour = 129,600 pounds per hour

Maximum process weight rate of aluminum or zinc parts = 3,600 pounds per hour

Maximum process weight rate (for 326 IAC 6-3-2)
= 129,600 (shot) + 3,600 (metal parts)
= 133,200 pounds per hour

The above pound per hour limitation was calculated with the following equation:

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

$$E = 55.0 * P^{0.11} - 40 \quad \text{where} \quad E = \text{rate of emission in pounds per hour and} \\ P = \text{process weight rate in tons per hour}$$

Natural gas-fired air make-up unit

- (p) 326 IAC 6-2 (Particulate Emission Limitations for Sources of Indirect Heating)
The natural gas-fired air make-up unit is not subject to 326 IAC 6-2 (Particulate Emission Limitations for Sources of Indirect Heating), because, pursuant to 326 IAC 1-2-19, these emission units do not meet the definition of an indirect heating unit.
- (q) 326 IAC 6-3-2 (Particulate Emission Limitations for Manufacturing Processes)
The natural gas-fired air make-up unit is exempt from the requirements of 326 IAC 6-3, because, pursuant to 326 IAC 1-2-59, liquid and gaseous fuels and combustion air are not considered as part of the process weight.

Conclusion and Recommendation

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 October 22, 2012. Additional information was received on December 13, 2012.

The operation of this source shall be subject to the conditions of the attached proposed Registration No. 075-32440-00034. The staff recommends to the Commissioner that this Registration be approved.

IDEM Contact

- (a) Questions regarding this proposed permit can be directed to Sarah Street at the Indiana Department Environmental Management, Office of Air Quality, Permits Branch, 100 North Senate Avenue, MC 61-53 IGCN 1003, Indianapolis, Indiana 46204-2251 or by telephone at (317) 232-8427 or toll free at 1-800-451-6027 extension 2-8427.
- (b) A copy of the findings is available on the Internet at: <http://www.in.gov/ai/appfiles/idem-caats/>
- (c) For additional information about air permits and how the public and interested parties can participate, refer to the IDEM's Guide for Citizen Participation and Permit Guide on the Internet at: www.in.gov/idem

**Appendix A: Emission Calculations
Summary**

Company Name: Fort Recovery Industries, Inc.
Address City IN Zip: 710 East 100 North, Portland, IN 47371
Permit Number: R075-32440-00034
Plt ID: 075-00034
Reviewer: Sarah Street

Unlimited Potential to Emit of New Emission Units (tons/yr)										
Emission Units	PM	PM10	PM2.5	SO ₂	NO _x	VOC	CO	GHGs as CO ₂ e	Total HAPs	Worst Single HAP
Furnaces (41-04, 41-05, 41-06)*	7.78	7.96	7.96	0.02	3.15	1.58	2.65	3,807.4	1.33	1.30 HF
Die casting units (41-04, 41-05, 41-06a, 41-06b)**	0.28	0.28	0.28	-	-	-	-	-	-	-
TOTAL	8.06	8.24	8.24	0.02	3.15	1.58	2.65	3,807	1.33	1.30 HF

* Emissions from the melters include combustion, melting, and fluxing processes.

** There is no pouring and cooling casting processes involved with the die casting process.

Sourcewide Unlimited Potential to Emit (tons/yr)										
Emission Units	PM	PM10	PM2.5	SO ₂	NO _x	VOC	CO	GHGs as CO ₂ e	Total HAPs	Worst Single HAP
Furnaces*	16.03	16.39	16.39	0.04	6.31	3.24	5.30	7,615	2.75	2.69 HF
Die casting units**	0.58	0.58	0.58	-	-	-	-	-	-	-
Dross Handling	0.48	0.48	0.48	-	-	-	-	-	-	-
Blasting unit	0.61	0.53	0.53	-	-	-	-	-	-	-
Natural Gas-Fired Air Make-Up Unit	0.03	0.11	0.11	0.01	1.50	0.08	1.26	1,815	0.03	0.03 Hexane
Fugitive Emissions (Roads)	0.83	0.19	0.03	-	-	-	-	-	-	-
TOTAL	18.56	18.29	18.12	0.05	7.81	3.32	6.56	9,429	2.78	2.69 HF

* Emissions from the melters include combustion, melting, and fluxing processes.

** There is no pouring and cooling casting processes involved with the die casting process.

**Appendix A: Emission Calculations
Reverberatory Furnaces (Zinc or Aluminum)**

Company Name: Fort Recovery Industries, Inc.
Address City IN Zip: 710 East 100 North, Portland, IN 47371
Permit Number: R075-32440-00034
Plt ID: 075-00034
Reviewer: Sarah Street

Die Cast Scrap Return Rate 45%

Flux Rate 4.31 lb/ton scrap (based on actual practices during aluminum melt only)

Furnace ID	Total Throughput Rate Metal (Aluminum or Zinc)		Scrap Throughput Rate	Flux Rate (during aluminum melt only)	Total Throughput Al + Flux	Heat Input Capacity	Potential Throughput
	lb/hr	tons/hr	tons/hr	lb/hr	tons/hr	MMBtu/hr	MMCF/yr
41-01	1,200	0.6	0.27	1.16	0.6006	2.4	21.02
41-02	1,000	0.5	0.225	0.97	0.5005	2.4	21.02
41-03	1,200	0.6	0.27	1.16	0.6006	2.4	21.02
New 41-04	1,000	0.5	0.225	0.97	0.5005	2.4	21.02
New 41-05	1,000	0.5	0.225	0.97	0.5005	2.4	21.02
New 41-06	1,200	0.6	0.27	1.16	0.6006	2.4	21.02
Total	6,600	3.3	1.49	6.40	3.3032	14.40	126.1

Methodology

Total Throughput Rate Metal (Aluminum or Zinc) (tons/hr) = Total Throughput Rate Metal (Aluminum or Zinc) (lb/hr) * 1 ton/2,000 lb
 Scrap Throughput Rate (tons/hr) = Total Throughput Rate Metal (Aluminum or Zinc) (tons/hr) * Die Cast Scrap Return Rate (%)
 Flux Rate (lb/hr) = Scrap Throughput Rate (ton/hr) * Flux Rate (lb/ton scrap)
 Total Throughput (Al + Flux) (ton/hr) = Total Throughput Rate Metal (Aluminum or Zinc) (ton/hr) + Flux Rate (lb/hr) * 1 ton/2,000 lb
 Potential Throughput (MMCF/yr) = Heat Input Capacity (MMBtu/hr) x 8,760 hrs/yr x 1 MMCF/1,000 MMBtu

Emissions from Natural Gas Combustion

Emission Factor in lb/MMCF	PM*	PM10*	SO ₂	**NO _x	VOC	CO
	1.9	7.6	0.6	100	5.5	84.0
Potential Emission in tons/yr	0.12	0.48	0.04	6.31	0.35	5.30

*PM and PM10 emission factors are condensable and filterable PM combined.

**Emission Factors for NO_x: Uncontrolled = 100, Low NO_x Burner = 50, Low NO_x Burners/Flue gas recirculation = 32

Emission Factor in lb/MMcf	Benzene	Dichlorobenzene	Formaldehyde	Hexane	Toluene	Total Haps
	0.0021	0.0012	0.0750	1.8000	0.0034	
Potential Emission in tons/yr	1.51E-05	8.64E-06	5.40E-04	1.30E-02	2.45E-05	1.35E-02

* Assume all the PM10 emissions are, PM2.5 emissions.

Emission Factors from AP-42, Chapter 1.4, Tables 1.4-1, 1.4-2, and 1.4-3, SCC #1-02-006-02, 1-01-006-02, 1-03-006-02, and 1-03-006-03 (AP-42 Supplement D 7/98)

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

Greenhouse Gas Emissions from Natural Gas Combustion

Emission Factor in lb/MMcf	Greenhouse Gas		
	CO ₂	CH ₄	N ₂ O
	120000	2.3	2.2
Potential Emission in tons/yr	7568.64	0.1451	0.1388
Summed Potential Emissions in tons/yr	7568.92		
CO ₂ e Total in tons/yr	7614.70		
Total	7614.70		

Methodology

The N₂O Emission Factor for uncontrolled is 2.2. The N₂O Emission Factor for low NO_x burner is 0.64.

Emission Factors are from AP 42, Table 1.4-2 SCC #1-02-006-02, 1-01-006-02, 1-03-006-02, and 1-03-006-03.

Global Warming Potentials (GWP) from Table A-1 of 40 CFR Part 98 Subpart A.

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

CO₂e (tons/yr) = CO₂ Potential Emission ton/yr x CO₂ GWP (1) + CH₄ Potential Emission ton/yr x CH₄ GWP (21) + N₂O Potential Emission ton/yr x N₂O GWP (310).

Reviewer: Sarah Street
 Appendix A: Emission Calculations
 Reverberatory Furnaces (Zinc or Aluminum)

Company Name: Fort Recovery Industries, Inc.
 Address City IN Zip: 710 East 100 North, Portland, IN 47371
 Permit Number: M075-32440-00034
 Pit ID: 075-00034
 Reviewer: Sarah Street

Emissions From Melting (including fluxing)

Metal	Pollutant	All Furnaces Throughput Rate (tons/hr)	Emission Factor in lb/ton	PTE (lbs/hr)	PTE (tons/yr)	
Aluminum or Zinc	PM	3.303	1.10	3.63	15.91	
	PM10	3.303	1.10	3.63	15.91	
	PM2.5	3.303	1.10	3.63	15.91	
	VOC	3.303	0.20	0.66	2.89	
	Cadmium	3.303	0.0004	0.0013	0.006	
	Nickel	3.303	0.0003	0.0010	0.004	
	Lead	3.303	0.0019	0.0063	0.027	
	Chromium	3.303	0.0002	0.0008	0.004	
	Copper	3.303	0.0003	0.0011	0.005	
		lb/hr flux		lb HF/lb flux		
		HF	6.40	0.096	0.61	2.69
			Total HAP	0.62	2.74	

Emission factors for PM are from STAPPA/ALAPCO Handbook, Section 11 for melting clean metal (aluminum). Zinc Melting for Secondary Zinc Processing in AP-42 12.14 for clean metallic scrap has negligible emissions and in FIRE for SCC 3-04-008-69 and AP-42 12.14 (not specified as clean charge only) is for 0.005 lb/ton PM. For this reason, aluminum melting emission factors are considered worst-case. PM10 and PM2.5 are assumed to be the same as PM. Emission factor for VOC is from zinc melting reverberatory furnace FIRE SCC 3-04-008-69 and is used as worst-case for both aluminum and zinc melting even though clean scrap is not specified.

Emission factors used are based on the Ohio facility for Metal HAPs and Copper.

Flux agent is added to clean oxide buildup in the furnace when melting aluminum. There is not any flux required when running zinc through a furnace. The fluxing agents used at Fort Recovery contain compounds with Fluorine in them. The Fluorine can react with moisture to form Hydrogen Fluoride (HF). HF is a gas that is a HAP but it is not a VOC or Particulate. Any particulate emissions that are generated as a result of the addition of flux are already included in the melting emissions from the furnaces in the separate calculation.

Emission Factor was calculated by assuming a 100% conversion rate of F to HF to be conservative. The current fluxes utilized at the plant have a calculated %F in the flux as 2.4% and 9.09%. 9.09% was assumed for all flux for ease of calculation and to be conservative. $9.09\% F \times (20.01 \text{ g/mol HF} / 18.998 \text{ g/mol F}) = 0.096 \text{ lb HF/lb flux}$

Methodology

Emissions (lbs/hr) = Throughput (lbs/hr) x 1 tons/2000 lbs x Emission Factor (lb/ton)

Emissions (tons/yr) = Throughput (lbs/hr) x 1 tons/2000 lbs x 8760 hr/yr x Emission Factor (lb/ton) x 2000 lb/ton

For fluxing, PTE (tons/yr) = Flux Throughput (lbs/hr) x Emission Factor (lb HF/lb flux) x 8760hr/yr x 1 ton/2000 lbs

Total Uncontrolled Emissions of the Melters (Combustion, Melting, and Fluxing Processes):

	Potential PM Emissions (tons/yr)	Potential PM10 Emissions (tons/yr)	Potential PM2.5 Emissions (tons/yr)	Potential SO ₂ Emissions (tons/yr)	Potential NOx Emissions (tons/yr)	Potential VOC Emissions (tons/yr)	Potential CO Emissions (tons/yr)	Potential CO ₂ e Emissions (tons/yr)	Total HAPs (tons/yr)	Worst Single HAP (tons/yr)
Combustion (Natural Gas)	0.12	0.48	0.48	0.038	6.307	0.347	5.298	7,615	0.01	0.01 Hexane
Melt	15.91	15.91	15.91	0.000	0.00	2.89	0.00	0	2.74	2.69 HF
Total	16.03	16.39	16.39	0.04	6.31	3.24	5.30	7,615	2.75	2.69 HF

**Appendix A: Emission Calculations
Die Casting Processes**

**Company Name: Fort Recovery Industries, Inc.
Address City IN Zip: 710 East 100 North, Portland, IN 47371
Permit Number: R075-32440-00034
Pit ID: 075-00034
Reviewer: Sarah Street**

Emissions from the Aluminum (or Zinc) Die Casting Process:

Clean Al or Zinc Input		
lbs/hr	tons/yr	Die Cast ID
1200	5256	41-01
1000	4380	41-02
1200	5256	41-03
1000	4380	41-04
1000	4380	41-05
600	2628	41-06a
600	2628	41-06b
6600	28908	(Total for 7)

3.3 tons/hr total

Note that Die Cast 6a and 6b are both connected to Furnace V41-06. Typical operation is planned to use both die cast machines at maximum of 600 lb/hr rate each. It would be possible to use only one die cast machine at the 1200 lb/hr rate. In that case, the second die cast machine could not be used so maximum emissions would still be the same. While each unit, 41-06a and 41-06b, have a maximum capacity of 1200 lb/hr, for emissions calculations these units will be considered at 600 lb/hr each.

	Pollutant	
Emission Factor (lbs/ton)	PM*	PM10*
	0.04	0.04
Potential to Emit before Control (lbs/hr)	0.13	0.13
Potential to Emit before Control (tons/yr)	0.58	0.58

* Assume all the PM emissions are PM10 and PM2.5 emissions.

Methodology

Emission Factors are from FIRE Version 6.23, SCC 3-04-004-09 (Lead Casting), which is the only available emission factor for pure metal casting process in FIRE. In addition, the die casting process is an enclosed molding process. Therefore, the particulate emissions from the die casting process are limited. There is not pouring and cooling casting processes involved with the die casting process.

PTE (lbs/hr) = Al Input (lbs/hr) x 1 ton/2000 lbs x Emission Factor (lbs/ton)

PTE (tons/yr) = Al Input (lbs/hr) x 1 ton/2000 lbs x Emission Factor (lbs/ton) x 8760 hr/yr x 1 ton/2000 lbs

Appendix A: Emission Calculations

Dross Handling

Company Name: Fort Recovery Industries, Inc.
Address City IN Zip: 710 East 100 North, Portland, IN 47371
Permit Number: R075-32440-00034
Plt ID: 075-00034
Reviewer: Sarah Street

Dross Handling and Cooling

Pollutant	Maximum Dross Handling Rate (tons/hr)	Emission Factor (lbs/ton)	Potential Emissions (lb/hr)	Potential Emissions (tons/yr)
PM	0.10	1.10	0.110	0.482
PM10	0.10	1.10	0.110	0.482
PM2.5	0.10	1.10	0.110	0.482

Notes:

Maximum Rate in the above table represents the amount of dross handled per hour.

There are no AP-42 emission factors for dross cooling at Secondary Aluminum Plants. Therefore, the handling emission factors from Table 12.5.1-3 for mini-steel mills is used. Emission factor is 0.11 lbs/ton after controls. With a control efficiency of 90%, the emission factor is 1.1 lbs/ton before controls.

Assume PM10 = PM2.5

Methodology:

Uncontrolled Emission Rate (lbs/hr) = Maximum Rate (tons/hr) * Emission Factor (lbs/ton)

Uncontrolled Emission Rate (tons/yr) = Uncontrolled Emission Rate (lbs/hr) * 8760 hrs / 2000 lbs.

**Appendix A: Emission Calculations
Shot Blast 5141**

Company Name: Fort Recovery Industries, Inc.
Address City IN Zip: 710 East 100 North, Portland, IN 47371
Permit Number: R075-32440-00034
Plt ID: 075-00034
Reviewer: Sarah Street

Shot Blast 5141, Emissions Unit 41-14 with Dust Collector 41-15, Stack ID V41-15

Shot Blast Type In Line Wheel, Enclosed
Media Type Steel Shot
Number of Wheels 4
Media Blast Rate 540 lb/wheel/minute
Media Usage Rate 35 lb/hr (non-recycled blast media)
Total Shot Blasted 2,160 lb/min
 129,600 lb/hour
Dust Collector 99.99% by wt. at 0.5+ micron
Efficiency

Pollutant	Uncontrolled Emission Factors*	Uncontrolled Potential to Emit (PTE)			Controlled Potential to Emit (PTE)		
	Steel Shot lb/lb of abrasive	lb/hr	lb/day	tons/year	lb/hr	lb/day	tons/year
PM	0.004	0.14	3.36	0.61	0.00001	0.00034	0.00006
PM10	0.00344	0.12	2.89	0.53	0.00001	0.00029	0.00005
PM2.5	0.00344	0.12	2.89	0.53	0.00001	0.00029	0.00005

*Emission Factors from STAPPA/ALAPCO "Air Quality Permits", Vol. I, Section 3 "Abrasive Blasting" (1991 edition)
0.86 lb PM10 / lb PM (STAPPA/ALAPCO reference)
PM2.5 = PM10

Media Blast Rate is the rate at which the media is thrown into the blast chamber at the part that is being blasted. Media Usage Rate is the rate at which media is being broken down and needing replaced. The broken down media is either separated as heavy waste for off-site disposal or is exhausted as air emission to the dust collector. The combined rate of waste plus air emission for this unit is 35 lb/hr.

The 35 lb/hr non-recycled blast media number is a maximum rate that is based on the type of shot abrasive used, the horsepower rating of the wheels, the number of wheels, and blasting of iron parts at a perpendicular angle. This is a worst-case rating and conservative number, because Fort Recovery Industries will be blasting Aluminum or Zinc Parts, which are softer and will break the shot media down at a slower rate and because parts are not typically blasted at a perpendicular angle.

Maximum Process Weight Rate (lb/hr)	Maximum Process Weight Rate (tons/hr)	326 IAC 6-3-2 Allowable PM emissions (lb/hr)	326 IAC 6-3-2 Allowable PM emissions (tons/yr)
3,600	1.80	6.08	26.63

Interpolation 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:
 $E = 4.10 P^{0.67}$ where E = rate of emission in pounds per hour; and
P = process weight rate in tons per hour

METHODOLOGY

Uncontrolled PTE (lb/hr) = Total Shot Blasted (lbs/hour) * Emission Factor (lb/lb)
Uncontrolled PTE (lb/day) = Uncontrolled PTE (lb/hr) * 24 hr/day
Uncontrolled PTE (tons/year) = Uncontrolled PTE (lb/hr) * 8760 hours/year * 1 ton/2000 lbs
Controlled PTE (tons/year) = Uncontrolled PTE (tons/yr) * (1-Control Efficiency%)

**Appendix A: Emission Calculations
Make-Up Air Natural Gas Combustion**

**Company Name: Fort Recovery Industries, Inc.
Address City IN Zip: 710 East 100 North, Portland, IN 47371
Permit Number: R075-32440-00034
Plt ID: 075-00034
Reviewer: Sarah Street**

Heat Input Capacity MMBtu/hr	HHV mmBtu mmscf	Potential Throughput MMCF/yr
3.50 (Make-Up Air Unit 5154)	1020	30.1

Emission Factor in lb/MMCF	Pollutant						
	PM*	PM10*	direct PM2.5*	SO2	NOx 100 **see below	VOC	CO
Potential Emission in tons/yr	0.0	0.1	0.1	0.0	1.5	0.1	1.3

*PM emission factor is filterable PM only. PM10 emission factor is filterable and condensable PM10 combined.

PM2.5 emission factor is filterable and condensable PM2.5 combined.

**Emission Factors for NOx: Uncontrolled = 100, Low NOx Burner = 50, Low NOx Burners/Flue gas recirculation = 32

Emission Factor in lb/MMcf	HAPs - Organics				
	Benzene	Dichlorobenzene	Formaldehyde	Hexane	Toluene
Potential Emission in tons/yr	3.156E-05	1.804E-05	1.127E-03	2.705E-02	5.110E-05

Emission Factor in lb/MMcf	HAPs - Metals				
	Lead	Cadmium	Chromium	Manganese	Nickel
Potential Emission in tons/yr	7.515E-06	1.653E-05	2.104E-05	5.711E-06	3.156E-05

Emission Factor in lb/MMcf	Greenhouse Gas		
	CO2	CH4	N2O
Potential Emission in tons/yr	1,804	0.0	0.0
Summed Potential Emissions in tons/yr	1,804		
CO2e Total in tons/yr	1,815		

Methodology

All emission factors are based on normal firing.

MMBtu = 1,000,000 Btu

MMCF = 1,000,000 Cubic Feet of Gas

Emission Factors are from AP 42, Chapter 1.4, Tables 1.4-1, 1.4-2, 1.4-3, SCC #1-02-006-02, 1-01-006-02, 1-03-006-02, and 1-03-006-03

Potential Throughput (MMCF) = Heat Input Capacity (MMBtu/hr) x 8,760 hrs/yr x 1 MMCF/1,020 MMBtu

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

The five highest organic and metal HAPs emission factors are provided above.

Additional HAPs emission factors are available in AP-42, Chapter 1.4.

The N2O Emission Factor for uncontrolled is 2.2. The N2O Emission Factor for low Nox burner is 0.64.

Emission Factors are from AP 42, Table 1.4-2 SCC #1-02-006-02, 1-01-006-02, 1-03-006-02, and 1-03-006-03.

Global Warming Potentials (GWP) from Table A-1 of 40 CFR Part 98 Subpart A.

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

CO2e (tons/yr) = CO2 Potential Emission ton/yr x CO2 GWP (1) + CH4 Potential Emission ton/yr x CH4 GWP (21) + N2O Potential Emission ton/yr x N2O GWP (310).

**Appendix A: Emission Calculations
Fugitive Dust Emissions - Paved Roads**

Company Name: Fort Recovery Industries, Inc
Address City IN Zip: 710 East 100 North, Portland, IN 47371
Permit Number: R075-32440-00034
Plt ID: 075-00034
Reviewer: Sarah Street

Paved Roads at Industrial Site

The following calculations determine the amount of emissions created by paved roads, based on 8,760 hours of use and AP-42, Ch 13.2.1 (1/2011).

Vehicle Information (provided by source)

Type	Maximum number of vehicles per day	Number of one-way trips per day per vehicle	Maximum trips per day (trip/day)	Maximum Weight Loaded (tons/trip)	Total Weight driven per day (ton/day)	Maximum one-way distance (feet/trip)	Maximum one-way distance (mi/trip)	Maximum one-way miles (miles/day)	Maximum one-way miles (miles/yr)
Vehicle (entering plant) (one-way trip)	100.0	1.0	100.0	2.0	200.0	256	0.048	4.8	1769.7
Vehicle (leaving plant) (one-way trip)	100.0	1.0	100.0	2.0	200.0	256	0.048	4.8	1769.7
Totals			200.0		400.0			9.7	3539.4

Average Vehicle Weight Per Trip = $\frac{2.0}{0.05}$ tons/trip
 Average Miles Per Trip = $\frac{0.05}{0.05}$ miles/trip

Unmitigated Emission Factor, Ef = $[k * (sL)^{0.91} * (W)^{1.02}]$ (Equation 1 from AP-42 13.2.1)

	PM	PM10	PM2.5	
where k =	0.011	0.0022	0.00054	lb/VMT = particle size multiplier (AP-42 Table 13.2.1-1)
W =	2.0	2.0	2.0	tons = average vehicle weight (provided by source)
sL =	9.7	9.7	9.7	g/m ² = silt loading value for paved roads at iron and steel production facilities - Table 13.2.1-3)

Taking natural mitigation due to precipitation into consideration, Mitigated Emission Factor, Eext = $E * [1 - (p/4N)]$ (Equation 2 from AP-42 13.2.1)

Mitigated Emission Factor, Eext = $Ef * [1 - (p/4N)]$
 where p = $\frac{125}{365}$ days of rain greater than or equal to 0.01 inches (see Fig. 13.2.1-2)
 N = 365 days per year

	PM	PM10	PM2.5	
Unmitigated Emission Factor, Ef =	0.176	0.035	0.0087	lb/mile
Mitigated Emission Factor, Eext =	0.161	0.032	0.0079	lb/mile
Dust Control Efficiency =	50%	50%	50%	(pursuant to control measures outlined in fugitive dust control plan)

Process	Unmitigated PTE of PM (tons/yr)	Unmitigated PTE of PM10 (tons/yr)	Unmitigated PTE of PM2.5 (tons/yr)	Mitigated PTE of PM (tons/yr)	Mitigated PTE of PM10 (tons/yr)	Mitigated PTE of PM2.5 (tons/yr)	Controlled PTE of PM (tons/yr)	Controlled PTE of PM10 (tons/yr)	Controlled PTE of PM2.5 (tons/yr)
Vehicle (entering plant) (one-way trip)	0.16	0.03	0.01	0.14	0.03	0.01	0.07	0.01	0.00
Vehicle (leaving plant) (one-way trip)	0.16	0.03	0.01	0.14	0.03	0.01	0.07	0.01	0.00
Totals	0.31	0.06	0.02	0.29	0.06	0.01	0.14	0.03	0.01

Methodology

Total Weight driven per day (ton/day) = [Maximum Weight Loaded (tons/trip)] * [Maximum trips per day (trip/day)]
 Maximum one-way distance (mi/trip) = [Maximum one-way distance (feet/trip)] / [5280 ft/mile]
 Maximum one-way miles (miles/day) = [Maximum trips per year (trip/day)] * [Maximum one-way distance (mi/trip)]
 Average Vehicle Weight Per Trip (ton/trip) = SUM[Total Weight driven per day (ton/day)] / SUM[Maximum trips per day (trip/day)]
 Average Miles Per Trip (miles/trip) = SUM[Maximum one-way miles (miles/day)] / SUM[Maximum trips per year (trip/day)]
 Unmitigated PTE (tons/yr) = [Maximum one-way miles (miles/yr)] * [Unmitigated Emission Factor (lb/mile)] * (ton/2000 lbs)
 Mitigated PTE (tons/yr) = [Maximum one-way miles (miles/yr)] * [Mitigated Emission Factor (lb/mile)] * (ton/2000 lbs)
 Controlled PTE (tons/yr) = [Mitigated PTE (tons/yr)] * [1 - Dust Control Efficiency]

Abbreviations

PM = Particulate Matter
 PM10 = Particulate Matter (<10 um)
 PM2.5 = Particle Matter (<2.5 um)
 PTE = Potential to Emit

**Appendix A: Emission Calculations
Fugitive Dust Emissions - Unpaved Roads**

Company Name: Fort Recovery Industries, Inc
Address City IN Zip: 710 East 100 North, Portland, IN 47371
Permit Number: R075-32440-00034
Plt ID: 075-00034
Reviewer: Sarah Street

Unpaved Roads at Industrial Site

The following calculations determine the amount of emissions created by unpaved roads, based on 8,760 hours of use and AP-42, Ch 13.2.2 (11/2006).

Vehicle Information (provided by source)

Type	Maximum number of vehicles	Number of one-way trips per day per vehicle	Maximum trips per day (trip/day)	Maximum Weight Loaded (tons/trip)	Total Weight driven per day (ton/day)	Maximum one-way distance (feet/trip)	Maximum one-way distance (mi/trip)	Maximum one-way miles (miles/day)	Maximum one-way miles (miles/yr)
Vehicle (entering plant) (one-way trip)	15.0	1.0	15.0	1.0	15.0	400	0.076	1.1	414.8
Vehicle (leaving plant) (one-way trip)	15.0	1.0	15.0	1.0	15.0	230	0.044	0.7	238.5
Totals			30.0		30.0			1.8	653.3

Average Vehicle Weight Per Trip = tons/trip
 Average Miles Per Trip = miles/trip

Unmitigated Emission Factor, Ef = $k[(s/12)^a][W/3]^b$ (Equation 1a from AP-42 13.2.2)

	PM	PM10	PM2.5	
where k =	4.9	1.5	0.15	lb/mi = particle size multiplier (AP-42 Table 13.2.2-2 for Industrial Roads)
s =	4.8	4.8	4.8	% = mean % silt content of unpaved roads (AP-42 Table 13.2.2-1 Sand/Gravel Processing Plant)
a =	0.7	0.9	0.9	= constant (AP-42 Table 13.2.2-2 for Industrial Roads)
W =	1.0	1.0	1.0	tons = average vehicle weight (provided by source)
b =	0.45	0.45	0.45	= constant (AP-42 Table 13.2.2-2 for Industrial Roads)

Taking natural mitigation due to precipitation into consideration, Mitigated Emission Factor, Eext = $E * [(365 - P)/365]$ (Equation 2 from AP-42 13.2.2)

Mitigated Emission Factor, Eext = $E * [(365 - P)/365]$
 where P = days of rain greater than or equal to 0.01 inches (see Fig. 13.2.2-1)

	PM	PM10	PM2.5	
Unmitigated Emission Factor, Ef =	1.57	0.40	0.04	lb/mile
Mitigated Emission Factor, Eext =	1.03	0.26	0.03	lb/mile
Dust Control Efficiency =	50%	50%	50%	(pursuant to control measures outlined in fugitive dust control plan)

Process	Unmitigated PTE of PM (tons/yr)	Unmitigated PTE of PM10 (tons/yr)	Unmitigated PTE of PM2.5 (tons/yr)	Mitigated PTE of PM (tons/yr)	Mitigated PTE of PM10 (tons/yr)	Mitigated PTE of PM2.5 (tons/yr)	Controlled PTE of PM (tons/yr)	Controlled PTE of PM10 (tons/yr)	Controlled PTE of PM2.5 (tons/yr)
Vehicle (entering plant) (one-way trip)	0.33	0.08	0.01	0.21	0.05	0.01	0.11	0.03	0.00
Vehicle (leaving plant) (one-way trip)	0.19	0.05	0.00	0.12	0.03	0.00	0.06	0.02	0.00
Totals	0.51	0.13	0.01	0.34	0.09	0.01	0.17	0.04	0.00

Methodology

- Total Weight driven per day (ton/day) = [Maximum Weight Loaded (tons/trip)] * [Maximum trips per day (trip/day)]
- Maximum one-way distance (mi/trip) = [Maximum one-way distance (feet/trip)] / [5280 ft/mile]
- Maximum one-way miles (miles/day) = [Maximum trips per year (trip/day)] * [Maximum one-way distance (mi/trip)]
- Average Vehicle Weight Per Trip (ton/trip) = SUM[Total Weight driven per day (ton/day)] / SUM[Maximum trips per day (trip/day)]
- Average Miles Per Trip (miles/trip) = SUM[Maximum one-way miles (miles/day)] / SUM[Maximum trips per year (trip/day)]
- Unmitigated PTE (tons/yr) = (Maximum one-way miles (miles/yr)) * (Unmitigated Emission Factor (lb/mile)) * (ton/2000 lbs)
- Mitigated PTE (tons/yr) = (Maximum one-way miles (miles/yr)) * (Mitigated Emission Factor (lb/mile)) * (ton/2000 lbs)
- Controlled PTE (tons/yr) = (Mitigated PTE (tons/yr)) * (1 - Dust Control Efficiency)

Abbreviations

- PM = Particulate Matter
- PM10 = Particulate Matter (<10 um)
- PM2.5 = Particulate Matter (<2.5 um)
- PTE = Potential to Emit



INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

We Protect Hoosiers and Our Environment.

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TO: Brian De Lucenay
Fort Recovery Industries Inc
2440 SR 49
Fort Recovery, OH 45846

DATE: January 16, 2013

FROM: Matt Stuckey, Branch Chief
Permits Branch
Office of Air Quality

SUBJECT: Final Decision
Registration
075-32440-00034

Enclosed is the final decision and supporting materials for the air permit application referenced above. Please note that this packet contains the original, signed, permit documents.

The final decision is being sent to you because our records indicate that you are the contact person for this application. However, if you are not the appropriate person within your company to receive this document, please forward it to the correct person.

A copy of the final decision and supporting materials has also been sent via standard mail to:
Holly Padovani (EHS Technology)
OAQ Permits Branch Interested Parties List

If you have technical questions regarding the enclosed documents, please contact the Office of Air Quality, Permits Branch at (317) 233-0178, or toll-free at 1-800-451-6027 (ext. 3-0178), and ask to speak to the permit reviewer who prepared the permit. If you think you have received this document in error, please contact Joanne Smiddie-Brush of my staff at 1-800-451-6027 (ext 3-0185), or via e-mail at jbrush@idem.IN.gov.

Final Applicant Cover letter.dot 11/30/07

Mail Code 61-53

IDEM Staff	CDENNY 1/16/2013 Fort Recovery Industries Inc 075-32440-00034 (final)		Type of Mail: CERTIFICATE OF MAILING ONLY	AFFIX STAMP HERE IF USED AS CERTIFICATE OF MAILING
Name and address of Sender		Indiana Department of Environmental Management Office of Air Quality – Permits Branch 100 N. Senate Indianapolis, IN 46204		

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6		Ms. Holly Padovani EHS Technology Group, LLC 965 Capstone Dr. Suite 420 Miamisburg OH 45342 (Consultant)										
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