



INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

We Protect Hoosiers and Our Environment.

Mitchell E. Daniels Jr.
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: December 14, 2011

RE: Technology Recyclers / 097 - 31071 - 05366

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

Notice of Decision – Approval

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 326 IAC 2, this approval was effective immediately upon submittal of the application.

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 from 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
FNPER-AM.dot12/3/07



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December 14, 2011

Mr. Joseph W. Zinkan
Technology Recyclers LLC
5821 Wycombe Lane
Indianapolis, IN 46220

Re: Exempt Construction and Operation Status,
E097-31071-05366

Dear Mr. Zinkan:

The application from Technology Recyclers LLC, received on October 26, 2011, has been reviewed. Based on the data submitted and the provisions in 326 IAC 2-1.1-3, it has been determined that the following portable fluorescent lamp crushing system to be initially located at 4000 Bethel Ave, Indianapolis, IN 46203 is classified as exempt from air pollution permit requirements:

- (a) One (1) portable fluorescent lamp crushing system, identified as The Bulb Eater, constructed in 2011, with a maximum capacity of 1661 pounds of fluorescent lamps/bulbs per day, with particulate matter emissions controlled by a first stage bag filter and a second stage HEPA filter and mercury vapor emissions controlled by a activated carbon filter, exhausting to the indoors. Once filling of a drum with crushed lamps is complete, the drums will be covered and sealed and then shipped offsite to Air Cycle Corporation for recycling.
- (b) Four (4) natural gas-fired space heaters, each constructed in 2010, each with a maximum heat input capacity of 400,000 MMBtu/hr, and each exhausting to the indoors.
- (c) Paved roads and parking lots with public access.

The following conditions shall be applicable:

1. 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.
2. 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 twenty percent (20%) 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.
3. The Permittee is authorized to relocate the source and operate in all areas of Indiana.

A copy of the Exemption is available on the Internet at: <http://www.in.gov/ai/appfiles/idem-caats/>. 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.idem.in.gov

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. If you have any questions on this matter, please contact Nathan Bell, OAQ, 100 North Senate Avenue, MC 61-53 IGCN 1003, Indianapolis, Indiana, 46204-2251, at 317-233-5670 or at 1-800-451-6027 (ext 35670).

Sincerely,



Iryn Calilung, Section Chief
Permits Branch
Office of Air Quality

IC/ncb

cc: File - Marion County
Marion County Health Department
Compliance and Enforcement Branch
Billing, Licensing and Training Section

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

Technical Support Document (TSD) for an Exemption

Source Description and Location
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Source Name: Technology Recyclers LLC (Portable)
Initial Source Location: 4000 Bethel Ave, Indianapolis, IN 46203
County: Marion
SIC Code: 5093 (Scrap and Waste Materials)
Exemption No.: E097-31071-05366
Permit Reviewer: Nathan C. Bell

On October 26, 2011, the Office of Air Quality (OAQ) has received an application from Technology Recyclers LLC related to the continued operation of their portable fluorescent lamp crushing system.

Existing Approvals

There have been no previous approvals issued to this source.

County Attainment Status

The source is located in Marion County.

Pollutant	Designation
SO ₂	Better than national standards.
CO	Attainment effective February 18, 2000, for the part of the city of Indianapolis bounded by 11 th Street on the north; Capitol Avenue on the west; Georgia Street on the south; and Delaware Street on the east. Unclassifiable or attainment effective November 15, 1990, for the remainder of Indianapolis and Marion County.
O ₃	Attainment effective November 8, 2007, 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	Attainment effective July 10, 2000, for the part of Franklin Township bounded by Thompson Road on the south; Emerson Avenue on the west; Five Points Road on the east; and Troy Avenue on the north. Attainment effective July 10, 2000, for the part of Wayne Township bounded by Rockville Road on the north; Girls School Road on the east; Washington Street on the south; and Bridgeport Road on the west. The remainder of the county is not designated.

¹Attainment effective October 18, 2000, for the 1-hour ozone standard for the Indianapolis area, including Marion County, and is a maintenance area for the 1-hour ozone National Ambient Air Quality Standards (NAAQS) for purposes of 40 CFR 51, Subpart X*. The 1-hour designation was revoked effective June 15, 2005.
 Basic nonattainment designation effective federally April 5, 2005, for PM2.5.

- (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. Marion 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}**
Marion County has been classified as nonattainment for PM_{2.5} in 70 FR 943 dated January 5, 2005. On May 8, 2008, U.S. EPA promulgated specific New Source Review rules for PM_{2.5} emissions. These rules became effective on July 15, 2008. Therefore, direct PM_{2.5} and SO₂ emissions were reviewed pursuant to the requirements of Nonattainment New Source Review, 326 IAC 2-1.1-5. See the State Rule Applicability – Entire Source section.
- (c) **Other Criteria Pollutants**
Marion 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

The fugitive emissions of criteria pollutants and hazardous air pollutants are counted toward the determination of 326 IAC 2-1.1-3 (Exemptions) applicability.

Background and Description of Emission Units and Pollution Control Equipment

The Office of Air Quality (OAQ) has reviewed an application, submitted by Technology Recyclers LLC relating to the continued operation of their existing portable fluorescent lamp crushing system.

The source consists of the following existing emission units:

- (a) One (1) portable fluorescent lamp crushing system, identified as The Bulb Eater, constructed in 2011, with a maximum capacity of 1661 pounds of fluorescent lamps/bulbs per day, with particulate matter emissions controlled by a first stage bag filter and a second stage HEPA filter and mercury vapor emissions controlled by a activated carbon filter, exhausting to the indoors. Once filling of a drum with crushed lamps is complete, the drums will be covered and sealed and then shipped offsite to Air Cycle Corporation for recycling.
- (b) Four (4) natural gas-fired space heaters, each constructed in 2010, each with a maximum heat input capacity of 400,000 MMBtu/hr, and each exhausting to the indoors.
- (c) Paved roads and parking lots with public access.

Portable Source

- (a) **Initial Location**
This is a portable source and its initial location is 4000 Bethel Ave, Indianapolis, IN 46203.
- (b) **PSD and Emission Offset Requirements**
The emissions from this portable source were reviewed under the requirements of the Prevention of Significant Deterioration (PSD) 326 IAC 2-2 and Emission Offset 326 IAC 2-3.
- (c) **Relocation Locations**
The Permittee is authorized to relocate the source and operate in all areas of Indiana.

Enforcement Issues

There are no pending enforcement actions related to this source.

Emission Calculations

See Appendix A of this TSD for detailed emission calculations.

Permit Level Determination – Exemption

The following table reflects the unlimited potential to emit (PTE) of the entire source after the integral baghouse 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
Fluorescent Lamp Crushing System (The Bulb Eater)	0.006	0.002	0.002	0.0	0.0	0.0	0.0	0.0	0.02	0.02 (mercury)
Natural Gas-Fired Space Heaters	0.01	0.04	0.05	0.004	0.69	0.04	0.58	829	0.01	0.01 (hexane)
Paved Roads (fugitive)	1.01	0.20	0.05	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total PTE of Entire Source	1.03	0.25	0.10	0.004	0.69	0.04	0.58	829	0.04	0.02 (mercury)
Exemptions Levels**	5	5	5	10	10	10	25	100,000 CO ₂ e	25	10
Registration Levels**	25	25	25	25	25	25	100	100,000 CO ₂ e	25	10

negl. = negligible
 *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 all regulated are within the levels listed in 326 IAC 2-1.1-3(e)(1). Therefore, the source is subject to the provisions of 326 IAC 2-1.1-3 (Exemptions).
- (b) The potential to emit (PTE) (as defined in 326 IAC 2-1.1-1(16)) 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) of 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) The requirements of the New Source Performance Standard (NSPS) for Small Industrial-Commercial-Institutional Steam Generating Units, 40 CFR 60, Subpart Dc (60.40c through 60.48c) (326 IAC 12), are not included in the permit, because each of the space heaters at this

source has a heat input rate less than or equal to 10 million Btu per hour (MMBtu/hr) and each are not considered a steam generating unit as defined by 40 CFR 60.41c.

- (b) There are no New Source Performance Standards (NSPS) (326 IAC 12 and 40 CFR Part 60) included in the permit.

National Emission Standards for Hazardous Air Pollutants (NESHAP)

- (c) The requirements of the National Emission Standards for Hazardous Air Pollutants (NESHAPs) from Off-Site Waste and Recovery Operations, 40 CFR Part 63, Subpart DD (326 IAC 20-23), are not included in the permit, because this source is not a major source of HAPs.
- (d) The requirements of the National Emission Standard for Hazardous Air Pollutants (NESHAP) for Industrial, Commercial, and Institutional Boilers and Process Heaters, 40 CFR 63, Subpart DDDDD (63.7480 through 63.7575) (326 IAC 20-95) are not included in the permit, because this source is not a major source of HAPs.
- (e) The requirements of the National Emission Standard for Hazardous Air Pollutants (NESHAP) for Industrial, Commercial, and Institutional Boilers Area Sources, 40 CFR 63, Subpart JJJJJJ (63.11193 through 63.11237), are not included in the permit, because the source does not contain boilers. This source only contains space heaters.
- (f) There are no National Emission Standards for Hazardous Air Pollutants (NESHAPs) (326 IAC 14, 326 IAC 20 and 40 CFR Part 63) included in the permit.

Compliance Assurance Monitoring (CAM)

- (g) 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 2-1.1-3 (Exemptions)
Exemption applicability is discussed under the Permit Level Determination – Exemption 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)
This source will initially be located in Marion County, but could be relocated to any other county in Indiana. 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), and it does not emit VOC or NO_x into the ambient air at levels equal to or greater than twenty-five (25) tons per year, 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)
This source will initially be located in Marion County, but could be relocated to any other county in Indiana. Since this source could be relocated to Lake County, the opacity shall meet the following for Lake County:
- 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 twenty percent (20%) 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 6.5 (Particulate Matter Limitations Except Lake County)
This source will initially be located in Marion County, but could be relocated to any other county in Indiana. Pursuant to 326 IAC 6.5-1-1(a) and 326 IAC 6.5-1-2(a), this source is not subject to the requirements of 326 IAC 6.5-1-2 (Particulate Matter Limitations Except Lake County), because this source (initially located in Marion County) is not specifically listed in 326 IAC 6.5-2 through 326 IAC 6.5-10, and does not have potential particulate matter emissions equal to or greater than 10 tons per year.
- (h) 326 IAC 6.8 (Particulate Matter Limitations for Lake County)
This source will initially be located in Marion County, but could be relocated to any other county in Indiana. Pursuant to 326 IAC 6.8-1-1(a), this source is not subject to the requirements of 326 IAC 6.8-1-2 (Particulate Matter Limitations for Lake County), because this source (which could be relocated to Lake County) is not specifically listed in 326 IAC 6.8-2 through 326 IAC 6.8-11, and does not have potential particulate matter emissions equal to or greater than 10 tons per year.
- (i) 326 IAC 12 (New Source Performance Standards)
See Federal Rule Applicability Section of this TSD.
- (j) 326 IAC 20 (Hazardous Air Pollutants)
See Federal Rule Applicability Section of this TSD

Fluorescent Lamp Crushing System (The Bulb Eater)

- (k) 326 IAC 6-3-2 (Particulate Emission Limitations for Manufacturing Processes)
Pursuant to 326 IAC 6-3-1(b)(14), the requirements of 326 IAC 6-3-2 are not applicable to the fluorescent lamp crushing system (The Bulb Eater), since it has potential particulate emissions less than five hundred fifty-one thousandths (0.551) pound per hour.

- (l) 326 IAC 8-1-6 (VOC Rules: General Reduction Requirements for New Facilities)
The fluorescent lamp crushing system (The Bulb Eater) is not subject to the requirements of 326 IAC 8-1-6, since the unlimited VOC potential emissions from is less than twenty-five (25) tons per year.
- (m) 326 IAC 8-7 (VOC Rules; Specific VOC Reduction Requirements for Lake, Porter, Clark, and Floyd Counties)
This source will initially be located in Marion County, but could be relocated to any other county in Indiana. Pursuant to 326 IAC 8-7-2(a), this source is not subject to the requirements of 326 IAC 8-7, since the unlimited VOC potential emissions from is less than twenty-five (25) tons per year.
- (n) There are no other 326 IAC 8 Rules that are applicable to the fluorescent lamp crushing system (The Bulb Eater).

Natural Gas-Fired Space Heaters

- (o) 326 IAC 6-2 (Particulate Emissions Limitations for Sources of Indirect Heating)
Each of the natural gas-fired space heaters is not subject to the requirements of 326 IAC 6-2, because they each are not an indirect heating unit.
- (p) 326 IAC 6.5 (Particulate Matter Limitations Except Lake County)
This source will initially be located in Marion County, but could be relocated to any other county in Indiana. Pursuant to 326 IAC 6.5-1-1(b), each of the natural gas-fired space heaters is not subject to the requirements of 326 IAC 6.5-1-2 (Particulate Matter Limitations Except Lake County), since they each burn only natural gas.
- (q) 326 IAC 6.8 (Particulate Matter Limitations for Lake County)
This source will initially be located in Marion County, but could be relocated to any other county in Indiana. Pursuant to 326 IAC 6.8-2-1(d), each of the natural gas-fired space heaters is not subject to the requirements of 326 IAC 6.8-1-2 (Particulate Matter Limitations for Lake County), since they each burn only natural gas.
- (r) 326 IAC 7-1.1 (Sulfur Dioxide Emission Limitations)
Pursuant to 326 IAC 7-1.1-1, each of the natural gas-fired space heaters at this source is not subject to the requirements of 326 IAC 7-1.1, since each has unlimited sulfur dioxide (SO₂) emissions less than twenty-five (25) tons per year and ten (10) pounds per hour respectively.
- (s) 326 IAC 8-1-6 (VOC Rules: General Reduction Requirements for New Facilities)
Each of the natural gas-fired space heaters is not subject to the requirements of 326 IAC 8-1-6, since the unlimited VOC potential emissions from each unit is less than twenty-five (25) tons per year.
- (t) There are no other 326 IAC 8 Rules that are applicable to the natural gas-fired space heaters.

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 26, 2011. Additional information received on November 3, 2011, December 9, 2011, and December 12, 2011.

The continued operation of this source shall be subject to the conditions of the attached proposed Exemption No. E097-31071-05366. The staff recommends to the Commissioner that this Exemption be approved.

IDEM Contact

- (a) Questions regarding this proposed permit can be directed to Nathan Bell at the Indiana Department Environmental Management, Office of Air Quality, Permits Branch, 100 North Senate Avenue, MC 61-53 IGCM 1003, Indianapolis, Indiana 46204-2251 or by telephone at (317) 233-5670 or toll free at 1-800-451-6027 extension 3-5670.
- (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.idem.in.gov

**TSD Appendix A: Emission Calculations
Emissions Summary**

Company Name: Technology Recyclers LLC
Source Address: 4000 Bethel Ave, Indianapolis, IN 46203
Permit Number: E097-31071-05366
Reviewer: Nathan Bell

Uncontrolled Potential to Emit (PTE) (tons/year)											
Emission Unit/Activity	PM	PM10	PM2.5	SO2	NOx	VOC	CO	GHGs as CO2e	Total HAPs	Worst Single HAP	
Fluorescent Lamp Crushing System (The Bulb Eater)	0.006	0.002	0.002	0.0	0.0	0.0	0.0	0.0	0.02	0.02	mercury
Natural Gas-Fired Space Heaters	0.01	0.04	0.05	0.004	0.69	0.04	0.58	829	0.01	0.01	hexane
Paved Roads (fugitive)	1.01	0.20	0.05	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Totals	1.03	0.25	0.10	0.004	0.69	0.04	0.58	829	0.04	0.02	mercury

Controlled Potential to Emit (PTE) (tons/year)											
Emission Unit/Activity	PM	PM10	PM2.5	SO2	NOx	VOC	CO	GHGs as CO2e	Total HAPs	Worst Single HAP	
Fluorescent Lamp Crushing System (The Bulb Eater)	1.8E-08	6.8E-09	6.8E-09	0.0	0.0	0.0	0.0	0.0	2.2E-06	2.2E-06	mercury
Natural Gas-Fired Space Heaters	0.01	0.04	0.05	0.004	0.69	0.04	0.58	829	0.01	0.01	hexane
Paved Roads (fugitive)	1.01	0.20	0.05	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Totals	1.03	0.24	0.10	0.004	0.69	0.04	0.58	829	0.01	0.01	hexane

**TSD Appendix A: Emission Calculations
Fluorescent Lamp Crushing System (The Bulb Eater)**

Company Name: Technology Recyclers LLC
Source Address: 4000 Bethel Ave, Indianapolis, IN 46203
Permit Number: E097-31071-05366
Reviewer: Nathan Bell

Potential to Emit Mercury (Hg) Vapor and PM/PM10/PM2.5

The fluorescent lamp crushing system (The Bulb Eater) may be used to crush spent fluorescent lamps of any length. However, based on information provided by the source, the system will primarily crush 4-ft T12 lamps (1-1/2 inch diameter) and 4-ft T8 lamps (1 inch diameter). The system, which collects the crushed lamps in a 55-gallon container, can hold up to 1350 crushed lamps of the smaller T8 lamp type or 875 crushed lamps of the larger T12 lamp type. Also, the mercury content of the smaller T8 lamp type is approximately 10 mg/lamp and the mercury content of the larger T12 lamp type is approximately 21 mg/lamp. To determine the potential to emit from the fluorescent lamp crushing system, the worst case emissions between crushing only T8 lamps and crushing only T12 lamps was determined (worst case emissions in bold text below).

	T8 Lamp	T12 Lamp	
Maximum Drum Filling Rate =	3.0	3.0	55-gallon drums/day (1)
Drum Storage Capacity =	1350	875	lbs lamps/55-gallon drum (2)
Maximum Capacity =	4050	2625	lamps/day
Average lamp Weight =	0.41	0.61	lbs/lamp (assuming 4ft length lamp) (3)
Maximum Capacity =	1661	1601	lbs lamps/day
Maximum Mercury Vapor Content =	10	21	mg/lamp (assuming 4ft length lamp) (4)
Maximum Mercury Vapor Content =	2.2E-05	4.6E-05	lb/lamp (assuming 4ft length lamp)
Uncontrolled Mercury Emissions =	0.016	0.022	tons/year
Mercury Vapor Control Efficiency =	99.99%	99.99%	(activated carbon filter)
Controlled Mercury Emissions =	1.6E-06	2.2E-06	tons/year
PM Emission Factor =	0.039	0.039	lb PM/ton of lamps (5)
PM10 Emission Factor =	0.015	0.015	lb PM10/ton of lamps (5)
PM2.5 Emission Factor =	0.015	0.015	lb PM2.5/ton of lamps (5)
Uncontrolled PM Emissions =	0.006	0.006	tons/year
Uncontrolled PM10 Emissions =	0.002	0.002	tons/year
Uncontrolled PM2.5 Emissions =	0.002	0.002	tons/year
Control Efficiency =	99.9997%	99.9997%	(99% bag filter and 99.97% HEPA filter)
Controlled PM Emissions =	1.8E-08	1.7E-08	tons/year
Controlled PM10 Emissions =	6.8E-09	6.6E-09	tons/year
Controlled PM2.5 Emissions =	6.8E-09	6.6E-09	tons/year

Methodology

- (1) Based on manufacturer's maximum recommended drum filling rate of one 55-gallon drum per 8-hour period
- (2) Based on manufacturer data on typical storage capacity of a 55-gallon drum
- (3) Based on information provided by the source
- (4) Based on typical fluorescent lamps manufactured from 2000-2007. Source: Mercury Emissions from the Disposal of Fluorescent Lamps, Final Report Office of Solid Waste, U.S. Environmental Protection Agency, June 30, 1997 (Tables 2-2 and 2-3) currently available on the internet at: <http://www.epa.gov/osw/hazard/wastetypes/universal/merc-emi/merc-pgs/merc-rpt.pdf>
- (5) There are no AP-42 PM/PM10/PM2.5 emission factors for crushing of fluorescent light lamps/bulbs. Therefore, emissions were estimated using emission factors for fines crushing (less than 3/16-inch diameter crushed material) from AP-42, Table 11.19.2-2, Emission Factors For Crushed Stone Processing Operations. PM2.5 emissions are assumed equal to PM10 emissions.

Maximum Capacity (lamps/day) = [Maximum Drum Filling Rate (55-gallon drums/day)] * [Drum Storage Capacity (lbs lamps/55-gallon drum)]
 Maximum Capacity (lbs lamps/day) = [Maximum Capacity (lamps/day)] * [Average lamp Weight (lbs/lamp)]
 Maximum Mercury Vapor Content (lb/lamp) = [Maximum Mercury Vapor Content (mg/lamp)] * [gram/1000 mg] * [lb/453.6 gram]
 Uncontrolled Mercury Emissions (tons/year) = [Maximum Capacity (lamps/day)] * [Maximum Mercury Vapor Content (lb/lamp)] * [365 days/year] * [ton/2000 lbs]
 Controlled Mercury Emissions (tons/year) = [Uncontrolled Mercury Emissions (tons/year)] * [1 - Control Efficiency (%)]
 Uncontrolled PM/PM10/PM2.5 Emissions (tons/year) = [Maximum Capacity (lbs lamps/day)] * [ton lamps/2000 lbs lamps] * [PM/PM10/PM2.5 Emission Factor (lb/ton)] * [365 days/year] * [ton/2000 lbs]
 Controlled PM/PM10/PM2.5 Emissions (tons/year) = [Uncontrolled PM/PM10/PM2.5 Emissions (tons/year)] * [1 - Control Efficiency (%)]

TSD Appendix A: Emission Calculations
Natural Gas Combustion Only
Capacity <100 MMBtu/hr
Space Heaters

Company Name: Technology Recyclers LLC
Source Address: 4000 Bethel Ave, Indianapolis, IN 46203
Permit Number: E097-31071-05366
Reviewer: Nathan Bell

Unit	Maximum Heat Input Capacity (MMBtu/hr)	High Heat Value (MMBtu/MMscf)	Potential Throughput (MMcf/yr)
Space Heater 1	0.40	1020	3.44
Space Heater 2	0.40	1020	3.44
Space Heater 3	0.40	1020	3.44
Space Heater 4	0.40	1020	3.44
Totals	1.60		13.74

Criteria Pollutants	Pollutant						
	PM*	PM10*	PM2.5*	SO2	NOx	VOC	CO
Emission Factor in lb/MMcf	1.9	7.6	7.6	0.6	100 **see below	5.5	84
Potential Emission in tons/yr	0.013	0.04	0.052	4.1E-03	0.69	0.038	0.58

*PM emission factor is filterable PM only. PM10 emission factor is filterable and condensable PM10 combined. PM2.5 assumed equal to PM10
 **Emission Factors for NOx: Uncontrolled = 100, Low NOx Burner = 50, Low NOx Burners/Flue gas recirculation = 32

Hazardous Air Pollutants	HAPs - Organics*					HAPs - Metals*				
	Benzene	DCB	Formaldehyde	Hexane	Toluene	Pb	Cd	Cr	Mn	Ni
Emission Factor in lb/MMcf	2.1E-03	1.2E-03	7.5E-02	1.8E+00	3.4E-03	5.0E-04	1.1E-03	1.4E-03	3.8E-04	2.1E-03
Potential Emission in tons/yr	1.4E-05	8.2E-06	5.2E-04	1.2E-02	2.3E-05	3.4E-06	7.6E-06	9.6E-06	2.6E-06	1.4E-05

*The five highest organic and metal HAPs emission factors are provided above. Additional HAPs emission factors are available in AP-42, Chapter 1.4.

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/1,000 MMBtu

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

Potential to Emit Total HAPs (tons/year) = 1.3E-02

Greenhouse Gases (GHGs)

Greenhouse Gases (GHGs)	Greenhouse Gas (GHG)		
	CO2	CH4	N2O
Emission Factor in lb/MMcf	120000	2.3	2.2
Potential Emission in tons/yr	824.47	1.6E-02	1.5E-02
Summed Potential Emissions in tons/yr	824.50		
CO2e Total in tons/yr	829.49		

Methodology

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.

Greenhouse 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).

Abbreviations

PM = Particulate Matter
 PM10 = Particulate Matter (<10 um)
 SO2 = Sulfur Dioxide
 NOx = Nitrous Oxides
 VOC = Volatile Organic Compounds
 CO = Carbon Monoxide

DCB = Dichlorobenzene
 Pb = Lead
 Cd = Cadmium
 Cr = Chromium
 Mn = Manganese
 Ni = Nickel

CO2 = Carbon Dioxide
 CH4 = Methane
 N2O = Nitrous Oxide
 CO2e = CO2 equivalent emissions

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

Company Name: Technology Recyclers LLC
Source Address: 4000 Bethel Ave, Indianapolis, IN 46203
Permit Number: E097-31071-05366
Reviewer: Nathan Bell

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	Vehicle 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)
Passenger Vehicle (entering plant) (one-way trip)	Passenger Vehicle (car/truck)	9.0	2.0	18.0	4.0	72.0	1007	0.191	3.4	1253.0
Passenger Vehicle (leaving plant) (one-way trip)	Passenger Vehicle (car/truck)	9.0	2.0	18.0	4.0	72.0	1007	0.191	3.4	1253.0
Shipping/Receiving Truck (entering plant) (one-way trip)	16' Straight Truck (2-axle)	2.0	3.5	7.0	6.0	42.0	1007	0.191	1.3	487.3
Shipping/Receiving Truck Truck (leaving plant) (one-way trip)	16' Straight Truck (2-axle)	2.0	3.5	7.0	6.0	42.0	1007	0.191	1.3	487.3
Shipping/Receiving Truck (entering plant) (one-way trip)	24' Straight Truck (2-axle)	2.0	3.5	7.0	9.0	63.0	1007	0.191	1.3	487.3
Shipping/Receiving Truck Truck (leaving plant) (one-way trip)	24' Straight Truck (2-axle)	2.0	3.5	7.0	9.0	63.0	1007	0.191	1.3	487.3
Total				64.0		354.0			12.2	4455.2

Average Vehicle Weight Per Trip = $\frac{5.5}{0.19}$ tons/trip
 Average Miles Per Trip = $\frac{5.5}{0.19}$ 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 =	5.5	5.5	5.5	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 =	0.498	0.100	0.0244	lb/mile
Mitigated Emission Factor, Eext =	0.455	0.091	0.0223	lb/mile

Process	Vehicle Type	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)
Passenger Vehicle (entering plant) (one-way trip)	Passenger Vehicle (car/truck)	0.31	0.06	0.02	0.29	0.06	0.01
Passenger Vehicle (leaving plant) (one-way trip)	Passenger Vehicle (car/truck)	0.31	0.06	0.02	0.29	0.06	0.01
Shipping/Receiving Truck (entering plant) (one-way trip)	16' Straight Truck (2-axle)	0.12	0.02	0.01	0.11	0.02	0.01
Shipping/Receiving Truck Truck (leaving plant) (one-way trip)	16' Straight Truck (2-axle)	0.12	0.02	0.01	0.11	0.02	0.01
Shipping/Receiving Truck (entering plant) (one-way trip)	24' Straight Truck (2-axle)	0.12	0.02	0.01	0.11	0.02	0.01
Shipping/Receiving Truck Truck (leaving plant) (one-way trip)	24' Straight Truck (2-axle)	0.12	0.02	0.01	0.11	0.02	0.01
		1.11	0.22	0.05	1.01	0.20	0.05

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



INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

We Protect Hoosiers and Our Environment.

Mitchell E. Daniels Jr.
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Thomas W. Easterly
Commissioner

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www.idem.IN.gov

SENT VIA U.S. MAIL: CONFIRMED DELIVERY AND SIGNATURE REQUESTED

TO: Joseph W Zinkan
Technology Recyclers
5821 Wycombe Lane
Indianapolis, IN 46220

DATE: December 14, 2011

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

SUBJECT: Final Decision
Exemption
097 - 31071 - 05366

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:
Matthew A Wright, Operating Mgr
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	LPOGOST 12/14/2011 Technology Recyclers LLC 097 - 31071 - 05366 /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		

Line	Article Number	Name, Address, Street and Post Office Address	Postage	Handing Charges	Act. Value (If Registered)	Insured Value	Due Send if COD	R.R. Fee	S.D. Fee	S.H. Fee	Rest. Del. Fee	Remarks
1		Joseph W Zinkan Technology Recyclers LLC 5821 Wycombe Lane Indianapolis IN 46220 (Source CAATS) Via confirmed delivery										
2		Matthew A Wright Operating Mgr Technology Recyclers LLC 4805 Basil Ct Indianapolis IN 46237 (RO CAATS)										
3		Marion County Health Department 3838 N, Rural St Indianapolis IN 46205-2930 (Health Department)										
4		Mrs. Sandra Lee Watson 7834 E 100 S Marion IN 46953 (Affected Party)										
5		Indianapolis City Council and Mayors Office 200 East Washington Street, Room E Indianapolis IN 46204 (Local Official)										
6		Marion County Commissioners 200 E. Washington St. City County Bldg., Suite 801 Indianapolis IN 46204 (Local Official)										
7		Matt Mosier Office of Sustainability 1200 S Madison Ave #200 Indianapolis IN 46225 (Local Official)										
8		Mark Zeltwanger 26545 CR 52 Nappanee IN 46550 (Affected Party)										
9												
10												
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