



INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

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August 10, 2004

Mr. William G. Conway, Jr.
Forest River, Inc. – Tsunami/Reflection Division
P.O. Box 3030
Elkhart, Indiana 46515

Re: Registered Operation Status,
039-18657-00307

Dear Mr. Conway:

The application from Forest River, Inc. – Tsunami/Reflection Division received on January 23, 2004, has been reviewed. Based on the data submitted and the provisions in 326 IAC 2-5.5, it has been determined that the following recreational vehicles manufacturing plant located at 1800 West Hively Avenue, Elkhart, Indiana 46315 is classified as registered:

- (a) One (1) woodworking facility with a maximum throughput rate of 600 pounds of prefinished panels and lumber per hour, controlled by a cyclone and a baghouse. The controls were installed in 1963 and the unit modified in 2004.
- (b) One (1) surface coating facility using airless spray guns, one (1) HVLP gun, and cloth wipes to apply coatings, caulks, sealants, cleaners, with a maximum throughput rate of 6.0 recreational vehicles (RV) per day. This unit was installed in 1963.
- (c) Twenty-one (21) natural gas space heaters, with a maximum heat input capacity of 6.30 MMBtu per hour, exhausting at twenty-one (21) stacks (identified as stacks 1 through 21).
- (d) One (1) metal inert gas (MIG) welding shop consisting of fifteen (15) welding stations, each consuming a maximum of 2.00 pounds of electrode per hour. This facility was constructed in 2004.
- (e) One (1) laminating bead (glue) application facility, with a maximum throughput of 6.0 recreational vehicles per day. This unit was constructed in 2004.

The following conditions shall be applicable:

- 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:
 - (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 15 minutes (60 readings) in a 6-hour period 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.

2. Pursuant to 326 IAC 6-3 (Particulate Matter Emission Limitations for Manufacturing Processes), any change or modification which would increase actual usage to greater than five (5) gallons of coating per day for the surface coating facility shall obtain prior approval from IDEM, OAQ and shall be subject to the requirements of 326 IAC 6-3.
3. Pursuant to 326 IAC 6-3-2 (Particulate Emission Limitations for Manufacturing Processes), particulate emissions from the wood working facility shall not exceed 1.83 pounds per hour when operating at a process weight rate of 600 pounds per hour.

The pounds per hour limitation was calculated with the following equation:

Interpolation of the data for the process weight rate up to 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
P = process weight rate in tons per hour

The cyclone and baghouse shall be in operation at all times the woodworking facility is in operation, in order to comply with this limit.

This registration is the third air approval issued to this source. The source may operate according to 326 IAC 2-5.5.

An authorized individual shall provide an annual notice to the Office of Air Quality that the source is in operation and in compliance with this registration pursuant to 326 IAC 2-5.5-4(a)(3)). The annual notice shall be submitted to:

**Compliance Data Section
Office of Air Quality
100 North Senate Avenue
P.O. Box 6015
Indianapolis, IN 46206-6015**

no later than March 1 of each year, with the annual notice being submitted in the format attached.

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.

Sincerely,
Original signed by

Paul Dubenetzky, Chief
Permits Branch
Office of Air Quality

ERG/SD

cc: File – Elkhart County
Elkhart County Health Department
Air Compliance – Paul Karkiewicz
Permit Tracking
Compliance Data Section

Registration Annual Notification

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

Company Name:	Forest River, Inc. – Tsunami/Reflection Division
Address:	1800 West Hively Avenue
City:	Elkhart, Indiana 46515
Authorized individual:	William G. Conway, Jr.
Phone #:	(574) 533-5934
Registration #:	039-18657-00307

I hereby certify that Forest River, Inc. – Tsunami/Reflection Division is still in operation and is in compliance with the requirements of Registration 039-18657-00307.

Name (typed):
Title:
Signature:
Date:

Indiana Department of Environmental Management
Office of Air Quality

Technical Support Document (TSD) for a Registration

Source Background and Description

Source Name:	Forest River, Inc. – Tsunami/Reflection Division
Source Location:	1800 West Hively Avenue, Elkhart, Indiana 46515
County:	Elkhart
SIC Code:	3711
Registration No.:	039-18657-00307
Permit Reviewer:	ERG/SD

The Office of Air Quality (OAQ) has reviewed an application from Forest River, Inc. – Tsunami/Reflection Division relating to the operation of a stationary recreational vehicles (RV) manufacturing plant.

History

On January 23, 2004, Forest River, Inc. –Tsunami/Reflection Division located at 1800 West Hively Avenue, Elkhart, Indiana submitted an application requesting IDEM, OAQ to operate the facility under SIC 3711 for a converted motor coaches or recreational vehicles (RV) manufacturing plant, with a maximum throughput of 600 pounds of prefinished panels and lumber per hour. The Permittee recently took over this source, formerly known as Skyline Homes, which was issued a Minor Source Operating Permit (MSOP) No.: 039-12338-00307 on January 16, 2001.

The source will no longer produce manufactured housing. In addition, the Permittee requested a change in the material usage for the surface coating facility, addition of one (1) laminating bead application, with a maximum throughput rate of 6 recreational vehicles (RV) per day, and the removal of one (1) gypsum operation from the source. The revised potential to emit of all criteria pollutants from the entire source are less than twenty-five (25) tons per year. Therefore, a registration was drafted.

All previous permits are superseded by this permit.

Permitted Emission Units and Pollution Control Equipment

The source consists of the following permitted emission units and pollution control devices:

- (a) One (1) woodworking facility with a maximum throughput rate of 600 pounds of prefinished panels and lumber per hour, controlled by a cyclone and a baghouse. The controls were installed in 1963 and the unit modified in 2004.
- (b) One (1) surface coating facility using airless spray guns, one (1) HVLP gun, and cloth wipes to apply coatings, caulks, sealants, cleaners, with a maximum throughput rate of 6.0 recreational vehicles (RV) per day. This unit was installed in 1963.
- (c) Twenty-one (21) natural gas space heaters, with a maximum heat input capacity of 6.30 MMBtu per hour, exhausting at twenty-one (21) stacks (identified as stacks 1 through 21).

Exempt Emission Units and Pollution Control Equipment

- (d) One (1) metal inert gas (MIG) welding shop consisting of fifteen (15) welding stations, each consuming a maximum of 2.00 pounds of electrode per hour. This facility was constructed in 2004.
- (e) One (1) laminating bead (glue) application facility, with a maximum throughput of 6.0 recreational vehicles per day. This unit was constructed in 2004.

Existing Approvals

The source has been operating under previous approvals including, but not limited to, the following:

- (a) MSOP No.: 039-12338-00307 issued on January 16, 2001.
- (b) First Notice Only Change No.: 039-18545-00307, issued January 14, 2004.

All previous permits are superseded by this permit.

All conditions from previous approvals were incorporated into this permit except the following:

MSOP 039-12338-00307 issued on January 16, 2001:

Condition D.1.3 and Conditions D.1.5 through D.1.10: Testing Requirement, Baghouse Inspection, Cyclone Inspection, Broken or Failed Bag/Cyclone Detection, Visible Emission Notations, and Record Keeping and Reporting Requirements.

Reason not incorporated: The above listed conditions were not incorporated in to the registration because the allowables pursuant to 326 IAC 6-3 are low.

Enforcement Issue

There are no enforcement actions pending.

Summary

Stack ID	Operation	Height (ft)	Diameter (ft)	Flow Rate (acfm)	Temperature (°F)
39	Woodworking	10	1.3 x 4.0	5,500	Ambient
1-21	Space Heaters	25	0.5	400 each	300

Recommendation

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

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

An application for the purposes of this review was received on January 23, 2004, with additional information received on March 4, 2004.

Emission Calculations

See Appendix A of this document for detailed emission calculations (pages 1 through 7).

Potential to Emit of the Source Before Controls

Pursuant to 326 IAC 2-1.1-1(16), Potential to Emit is defined as “the maximum capacity of a stationary source or emissions unit to emit any air pollutant under its physical and operational design. Any physical or operational limitation on the capacity of a source to emit an air pollutant, including air pollution control equipment and restrictions on hours of operation or type or amount of material combusted, stored, or processed shall be treated as part of its design if the limitation is enforceable by the U.S. EPA, the department, or the appropriate local air pollution control agency.”

Pollutant	Potential to Emit (tons/year)
PM	17.0
PM10	17.0
SO ₂	0.02
VOC	14.4
CO	2.32
NO _x	2.76

HAPs	Potential to Emit (tons/year)
Hexane	0.34
¹ MEK	0.21
² MDI	5.26
Toluene	5.25
Glycol Ether	0.01
Xylene	0.05
Methylene Chloride	0.005
³ PCE	2.57
Trichloroethylene	0.004
⁴ DEPH	0.06
Styrene	0.13
Formaldehyde	2.07E-03
Total	13.9

¹MEK = Methyl Ethyl Ketone
²MDI = 4-4' Methylene Diphenyl Diisocyanate
³PCE = Perchloroethylene
⁴DEHP = Bis (2-ethylhexyl) phthalate

- (a) The potential to emit (as defined in 326 IAC 2-1.1-1(16)) of all criteria pollutants is less than twenty-five (25) tons per year. Therefore, the source is subject to the provisions of 326 IAC 2-5.5. A registration will be issued.
- (b) The potential to emit (as defined in 326 IAC 2-1.1-1(16)) of any single HAP is less than ten (10) tons per year and the potential to emit (as defined in 326 IAC 2-1.1-1(16)) of a combination of HAPs is less than twenty-five (25) tons per year.
- (c) Fugitive Emissions
 Since this type of operation is not in one of the twenty-eight (28) listed source categories under 326 IAC 2-2 and since there are no applicable New Source Performance Standards that were in effect on August 7, 1980, the fugitive particulate matter (PM) and volatile organic compound (VOC) emissions are not counted toward determination of PSD applicability.

County Attainment Status

The source is located in Elkhart County.

Pollutant	Status
PM10	Attainment

SO ₂	Attainment
NO ₂	Attainment
Ozone	Attainment
CO	Attainment
Lead	Attainment

- (a) Volatile organic compounds (VOC) are precursors for the formation of ozone. Therefore, VOC emissions are considered when evaluating the rule applicability relating to the ozone standards. Elkhart County has been designated as attainment for ozone. Therefore, VOC emissions were reviewed pursuant to the requirements for Prevention of Significant Deterioration (PSD), 326 IAC 2-2. See the State Rule Applicability for the source section.
- (b) Elkhart County has been classified as attainment for all other criteria pollutants. Therefore, these emissions were reviewed pursuant to the requirements for Prevention of Significant Deterioration (PSD), 326 IAC 2-2. See the State Rule Applicability for the source section.
- (b) Fugitive Emissions
 Since this type of operation is not one of the 28 listed source categories under 326 IAC 2-2 or 2-3 and since there are no applicable New Source Performance Standards that were in effect on August 7, 1980, the fugitive particulate matter (PM) and volatile organic compound (VOC) emissions are not counted toward determination of PSD and Emission Offset applicability.

Source Status

Existing Source PSD, Definition (emissions after controls, based on 8760 hours of operation per year at rated capacity and/or as otherwise limited):

Pollutant	Emissions (tons/year)
PM	17.0
PM10	17.0
SO ₂	0.02
VOC	14.4
CO	2.32
NO _x	2.76
Single HAP (MDI)	5.26
Combination HAPs	13.9

- (a) This existing source is not a major stationary source because no attainment regulated pollutant is emitted at a rate of 250 tons per year or greater and it is not in one of the 28 listed source categories.

Part 70 Permit Determination

326 IAC 2-7 (Part 70 Permit Program)

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

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

This is the third air approval issued to this source.

These emissions were based on the potential to emit calculations for the source as shown in Appendix A.

Federal Rule Applicability

- (a) There are no New Source Performance Standards (NSPS)(326 IAC 12 and 40 CFR Part 60) applicable to this source.
- (b) This source is not subject to 40 CFR 63, Subpart JJ - National Emission Standards for Hazardous Air Pollutants from Wood Furniture Manufacturing Operations (326 IAC 14, and 20) because this source is not a major source of HAPs as defined in 40 CFR 63, Subpart A and does not manufacture wood furniture or wood furniture components.

There are no other National Emission Standard for Hazardous Air Pollutant (NESHAPs) (326 IAC 14, 20 and 40 CFR Part 61, 63) applicable to this source.

State Rule Applicability – Entire Source

326 IAC 2-6 (Emission Reporting)

This source is not subject to 326 IAC 2-6 (Emission Reporting) because it does not have the potential to emit more than twenty-five (25) tons per year of VOC and is not located in Lake or Porter Counties. It is located in Elkhart County.

326 IAC 2-2 (Prevention of Significant Deterioration (PSD))

This source was built prior to August 7, 1977 and is not in one (1) of the twenty-eight (28) listed source categories. At construction the potential to emit of all criteria pollutants were calculated to less than 250 tons per year PSD threshold. The source was modified in 2004 to add one (1) welding shop, one (1) laminating bead (glue) application facility, while one (1) gypsum operation was permanently removed from the source. After these modifications, the potential to emit of each criteria pollutant from the entire source remained less than 250 tons per year. Therefore, it is an existing minor source under PSD and the requirements of 326 IAC 2-2 are not applicable.

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 the permit:

- (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.

326 IAC 2-4.1 (Major Sources of Hazardous Air Pollutants (HAP))

The operation of this stationary recreational vehicles manufacturing plant will emit less than ten (10) tons per year of a single HAP and less than twenty-five (25) tons per year of a combination of HAPs. Therefore, IAC 2-4.1 does not apply.

State Rule Applicability – Surface Coating Facility, Laminating Bead Application Facility

326 IAC 8-1-6 (General Reduction Requirements for VOC Emissions)

The potential VOC emissions from the surface coating and laminating bead application facilities are each less than twenty-five (25) tons per year. Therefore, the requirements of 326 IAC 8-1-6 are not applicable.

326 IAC 8-2-12 (Wood Furniture and Cabinet Coating)

This surface coating and laminating bead application facilities are not subject to the requirements of 326 IAC 8-2-12 (Wood Furniture and Cabinet Coating) because the source does not apply any coatings and glue to wood furniture or cabinets. The coatings and glue are applied to wood panels used in recreational vehicles parts.

326 IAC 6-3 (Particulate Matter Emission Limitations for Manufacturing Processes)

- (a) The surface coating facility is not subject to 326 IAC 6-3-1 (Particulate Matter Emission Limitations for Manufacturing Processes) because coating usage is less than five (5) gallons of per day [326 IAC 6-3-1(b)(15)]. Any change or modification which would increase actual usage to greater than five

(5) gallons of coating per day for the surface coating facility shall obtain prior approval from IDEM, OAQ and shall be subject to the requirements of 326 IAC 6-3.

- (b) Although the source uses more than five (5) gallons of glue per day in the one (1) laminating bead (glue) application facility, it is not subject to 326 IAC 6-3-1 (Particulate Matter Emission Limitations for Manufacturing Processes) because the glue is applied by extrusion.

State Rule Applicability – Woodworking Facility

326 IAC 6-3-2 (Particulate Emission Limitations for Manufacturing Processes)

Pursuant to 326 IAC 6-3-2 (Particulate Emission Limitations for Manufacturing Processes), particulate emissions from the wood working facility shall not exceed 1.83 pounds per hour when operating at a process weight rate of 600 pounds per hour.

The pounds per hour limitation was calculated with the following equation:

Interpolation of the data for the process weight rate up to 60,000 pounds per hour shall be accomplished by use of the equation:

$$E = 4.10 P^{0.67} \quad \text{where}$$

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

The cyclone and baghouse shall be in operation at all times the woodworking facility is in operation, in order to comply with this limit.

Visible emissions notations are not required for the cyclone and baghouse because the allowable pursuant to 326 IAC 6-3-2 are low.

State Rule Applicability - Welding Operations

326 IAC 6-3 (Particulate Matter Emission Limitations for Manufacturing Processes)

This source is not subject to 326 IAC 6-3-1 (Particulate Matter Emission Limitations for Manufacturing Processes) because the one (1) metal inert gas (MIG) welding operation consumes less than six hundred and twenty-five (625) pounds of rod or wire per day [326 IAC 6-3-1(b)(9)].

State Rule Applicability – Natural Gas-Fired Combustion Units

326 IAC 6-3-2 (Particulate Emission Limitations for Manufacturing Processes)

The natural gas-fired combustion units are not subject to the requirements of 326 IAC 6-3-2 (Particulate Emission Limitations for Manufacturing Processes) because particulate emissions from these units are from combustion only.

Conclusion

The operation of this stationary recreational vehicles manufacturing plant shall be subject to the conditions of the Registration 039-18657-00307.

Natural Gas Combustion Only

Company Name:
Address:
Registration: 039-18657
Plt ID: 039-00307
Reviewer: ERG/SD
Date: 25-Feb-04

Heat Input Capacity
(MMBtu/hour)

Potential Throughput
(MMCF/year)

6.30 (21 units only)

55.2

	Pollutant					
	PM*	PM10*	SO ₂	** NO _x	VOC	CO
Emission Factor (lb/MMCF)	7.60	7.60	0.60	100	5.50	84.0
Potential To Emit (tons/year)	0.21	0.21	0.02	2.76	0.15	2.32

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

** Emission factor for NO_x (Uncontrolled) = 100 lb/MMCF.

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, and 1.4-3, SCC #1-02-006-02, 1-01-006-02, 1-03-006-02, and 1-03-006-03 (July, 1998).

METHODOLOGY

Potential Throughput (MMCF/year) = Heat Input Capacity (MMBtu/hour) * 8760 hours/year * 1 MMCF/1000 MMBtu

Potential To Emit (tons/year) = Potential Throughput (MMCF/year) * Emission Factor (lb/MMCF) * 1 ton/2000 lbs

See next page for HAPs emissions calculations.

Natural Gas Combustion Only

Company Name:

Address:

Registration: 039-18657

Plt ID: 039-00307

Reviewer: ERG/SD

Date: 25-Feb-04

HAPs - Organics

Emission Factor (lb/MMCF)	Benzene 2.1E-03	Dichlorobenzene 1.2E-03	Formaldehyde 7.5E-02	Hexane 1.8E+00	Toluene 3.4E-03
Potential To Emit (tons/year)	5.79E-05	3.31E-05	2.07E-03	4.97E-02	9.38E-05

HAPs - Metals

Emission Factor (lb/MMCF)	Lead 5.0E-04	Cadmium 1.1E-03	Chromium 1.4E-03	Manganese 3.8E-04	Nickel 2.1E-03
Potential To Emit (tons/year)	1.38E-05	3.04E-05	3.86E-05	1.05E-05	5.79E-05

Methodology is the same as previous page.

The five highest organic and metal HAPs emission factors as provided above are from AP-42, Chapter 1.4, Table 1-4.2, 1.4-3 and 1.4-4 (July, 1998). Additional HAPs emission factors are available in AP-42, Chapter 1.4.

**Appendix A: Emissions Calculations
VOC and PM/PM10
From Surface Coating Operation**

Company Name: Forest River, Inc. - Tsunami/Reflection Division
Address: 1800 West Hively Ave., Elkhart, Indiana 46515
Registration: 039-18657
Pit ID: 039-00307
Reviewer: ERG/SD
Date: 25-Feb-04

Material	Density (lb/gal)	Weight % Volatile (H ₂ O & Organics)	Weight % Water	Weight % Organics	Volume % Water	Gal of Mat. (gal/unit)	Maximum (unit/hour)	Pounds VOC per gallon of coating less water	Pounds VOC per gallon of coating	PTE of VOC (lbs/hour)	PTE of VOC (lbs/day)	PTE of VOC (tons/year)	PTE of PM/PM10 (ton/year)	Transfer Efficiency
Lap Sealant	9.91	32.5%	0.00%	32.5%	0.00%	0.50	0.25	3.22	3.22	0.40	9.66	1.76	0.00	100%
Oatey ABS Cement	7.25	78.0%	0.00%	78.0%	0.00%	0.03	0.25	5.66	5.66	0.04	1.02	0.19	0.00	100%
Oatey Cleaner	6.61	100%	10.0%	90.0%	10.0%	0.004	0.25	6.61	5.95	0.01	0.14	0.03	0.00	100%
Rectorseal No. 5	11.5	30.0%	0.00%	30.0%	0.00%	0.00	0.25	3.45	3.45	0.00	0.04	0.01	0.00	100%
Web 76 Adhesive	5.83	77.2%	17.1%	60.1%	25.0%	0.04	0.25	4.67	3.50	0.03	0.82	0.15	0.03	55%
Panel Hold Black RV Foam	8.41	15.4%	0.00%	15.4%	0.00%	0.92	0.25	1.30	1.30	0.30	7.15	1.30	1.79	75%
Panel Hold Cleaner	6.58	100%	85.0%	15.0%	85.0%	0.25	0.25	6.58	0.99	0.06	1.48	0.27	0.00	55%
Ethanol	6.70	100%	5.00%	95.0%	5.00%	0.21	0.25	6.70	6.37	0.33	8.02	1.46	0.00	100%
Battery Protector C121	6.00	73.0%	0.00%	73.0%	0.00%	0.00	0.25	4.38	4.38	0.00	0.05	0.01	0.00	55%
Alpha 8011 Adhesive	8.35	0.20%	0.00%	0.2%	0.00%	2.00	0.25	0.02	0.02	0.01	0.20	0.04	0.00	100%
Alpha 1013 Adhesive	9.00	48.0%	0.00%	48.0%	0.00%	0.90	0.25	4.32	4.32	0.97	23.3	4.26	0.00	100%
Nuflex 302 Silicone	8.58	3.10%	0.00%	3.1%	0.00%	0.15	0.25	0.27	0.27	0.01	0.24	0.04	0.00	100%
Spray N Go Paint	6.66	75.2%	0.00%	75.2%	0.00%	0.13	0.25	5.01	5.01	0.16	3.76	0.69	0.10	55%
Glass Cleaner	8.25	100%	93.5%	6.5%	93.5%	0.24	0.25	8.25	0.54	0.03	0.77	0.14	0.00	100%
Instant Bond White Glue	9.16	72.0%	71.5%	0.5%	71.5%	1.20	0.25	0.16	0.05	0.01	0.33	0.06	0.00	100%
Mastic SIA175	12.50	0.00%	0.00%	0.0%	0.00%	0.61	0.25	0.00	0.00	0.00	0.00	0.00	0.00	100%
Brake & Parts Cleaner	12.00	100%	72.0%	28.0%	72.0%	0.001	0.25	12.00	3.36	0.00	0.02	0.00	0.00	55%
Geocell 2320	7.91	35.1%	0.00%	35.1%	0.00%	0.60	0.25	2.78	2.78	0.42	10.0	1.82	0.00	100%
DAP 4000 Const Adhesive	8.85	38.7%	0.0%	38.7%	0.00%	0.24	0.25	3.42	3.42	0.21	4.93	0.90	0.57	60%
Elastomeric Clear Sealant	7.83	32.5%	0.00%	32.5%	0.00%	0.25	0.25	2.54	2.54	0.16	3.82	0.70	0.00	100%
WD-40	6.80	70.0%	0.30%	69.7%	0.30%	0.002	0.25	4.75	4.74	0.00	0.06	0.01	0.00	100%
Sta-put 2001 M	5.91	75.0%	55.5%	19.5%	0.00%	0.10	0.25	1.15	1.15	0.03	0.71	0.13	0.00	100%
BM SuperDuty Polishing Compound	8.78	41.9%	27.9%	14.0%	27.9%	0.008	0.25	1.70	1.23	0.00	0.06	0.01	0.00	100%
Finishing Putty	9.58	24.5%	0.00%	24.5%	0.00%	0.008	0.25	2.35	2.35	0.00	0.11	0.02	0.00	100%
Enerbond 45 SF	10.00	100%	100%	0.0%	26.0%	0.10	0.25	0.00	0.00	0.00	0.00	0.00	0.00	100%
Enerbond 10 Cleaner	7.98	95.8%	23.8%	72.0%	23.2%	0.001	0.25	7.49	5.75	0.00	0.03	0.01	0.00	100%
Gelcoat Filon Panel White	10.83	36.7%	0.00%	36.7%	0.00%	0.02	0.25	3.97	3.97	0.02	0.48	0.09	0.05	65%
ITW Foamseal S11608	9.83	39.0%	37.0%	2.0%	37.0%	0.42	0.25	0.31	0.20	0.02	0.50	0.09	0.00	100%
ITW Foamseal FSA	10.33	100%	100%	0.0%	0.00%	0.42	0.25	0.00	0.00	0.00	0.00	0.00	0.00	100%
Feather Rite Body Filler	9.66	18.6%	0.00%	18.6%	0.00%	0.001	0.25	1.80	1.80	0.00	0.01	0.00	0.00	100%
Lacquer Thinner	7.00	100%	0.00%	100.0%	0.00%	0.003	0.25	7.00	7.00	0.01	0.13	0.02	0.00	100%

POTENTIAL TO EMIT IN TONS PER YEAR = 14.2 2.54

Materials assigned 100 % transfer efficiency are extruded or wiped on the substrate, while material assigned 55 % transfer efficiency are applied using an airless spray gun
 Gelcoat filon panel white is applied using one (1) HVLP spray gun, with a 65 % transfer efficiency

METHODOLOGY

Pounds of VOC per Gallon of Coating less Water =(Density (lb/gal) * Weight % Organics * 1/(1-Volume % Water))
 Pounds of VOC per Gallon of Coating = Density (lb/gal) * Weight % Organics
 PTE of VOC (lbs/hour) = Pounds of VOC/Gallon of Coating (lb/gal) * Gal of Material (gal/unit) * Maximum (units/hour)
 PTE of VOC (lbs/day) = Pounds of VOC/Gallon of Coating (lb/gal) * Gal of Material (gal/unit) * Maximum (units/hour) * 24 hours/day
 PTE of VOC (tons/year) = Pounds of VOC per Gallon of Coating (lb/gal) * Gal of Material (gal/unit) * Maximum (units/hour) * (8760 hours/year) * 1 ton/2000 lbs
 PTE of PM/PM10 (tons/year) = Maximum (units/hour) * Gal of Mat (gal/unit) * Density (lbs/gal) * (1- Weight % Volatile) * (1-Transfer Efficiency %) *8760 hours/year *1 ton/2000 lbs

Appendix A: Emission Calculations
HAP Emissions
From Surface Coating Operation

Company Name: Forest River, Inc. - Tsunami/Reflection Division
Address: 1800 West Hively Ave., Elkhart, Indiana 46515
Registration: 039-18657
Plt ID: 039-00307
Reviewer: ERG/SD
Date: 25-Feb-04

Material	Density (lb/gal)	Gallons of Material (gal/unit)	Maximum (unit/hour)	Weight % Hexane	Weight % MEK	Weight % MDI	Weight % Toluene	Weight % Glycol Ether	Weight % Xylene	Weight % Methylene Chloride	Weight % PCE	Weight % Trichloro-Ethylene	Weight % DEPH	Weight % Styrene
Lap Sealant	9.91	0.50	0.25											
Oatey ABS Cement	7.25	0.03	0.25		75.0%									
Oatey Cleaner	6.61	0.004	0.25		95.0%									
Rectorseal No. 5	11.5	0.00	0.25											
Web 76 Adhesive	5.83	0.04	0.25	25.0%										
Panel Hold Black RV Foam	8.41	0.92	0.25			20.0%								
Panel Hold Cleaner	6.58	0.25	0.25											
Ethanol	6.70	0.21	0.25											
Battery Protector C121	6.00	0.00	0.25				15.0%							
Alpha 8011 Adhesive	8.35	2.00	0.25											
Alpha 1013 Adhesive	9.00	0.90	0.25				48.0%							
Nuflex 302 Silicone	8.58	0.15	0.25					1.00%						
Spray N Go Paint	6.66	0.13	0.25						5.00%					
Glass Cleaner	8.25	0.24	0.25											
Instant Bond White Glue	9.16	1.20	0.25											
Mastic SIA175	12.50	0.61	0.25			5.00%								
Brake & Parts Cleaner	12.00	0.001	0.25							35.0%	45.0%	30.0%		
Geocell 2320	7.91	0.60	0.25								49.4%			
DAP 4000 Const Adhesive	8.85	0.24	0.25	10.0%			10.0%							
Elastomeric Clear Sealant	7.83	0.25	0.25				35.0%						3.00%	
WD-40	6.80	0.002	0.25											
Sta-put 2001 M	5.91	0.10	0.25											
3M SuperDuty Polishing Compound	8.78	0.008	0.25											
Finishing Putty	9.58	0.008	0.25											40.00%
Enerbond 45 SF	10.00	0.10	0.25			80.0%								
Enerbond 10 Cleaner	7.98	0.001	0.25											40.00%
Gelcoat Filon Panel White	10.83	0.02	0.25											
ITW Foamseal S11608	9.83	0.42	0.25			50.0%								
ITW Foamseal FSA	10.33	0.42	0.25											
Feather Rite Body Filler	9.66	0.001	0.25											20.00%
Lacquer Thinner	7.00	0.003	0.25				60.0%							

Material	Density (lb/gal)	Gallons of Material (gal/unit)	Maximum (unit/hour)	PTE of Hexane (tons/year)	PTE of MEK (tons/year)	PTE of MDI (tons/year)	PTE of Toluene (tons/year)	PTE of Glycol Ether (tons/year)	PTE of Xylene (tons/year)	PTE of Methylene Chloride (tons/year)	PTE of PCE (tons/year)	PTE of Trichloro-Ethylene (tons/year)	PTE of DEPH (tons/year)	PTE of Styrene (tons/year)
Lap Sealant					0.18									
Oatey ABS Cement					0.03									
Oatey Cleaner														
Rectorseal No. 5				0.06										
Web 76 Adhesive						1.69								
Panel Hold Black RV Foam														
Panel Hold Cleaner														
Ethanol							0.002							
Battery Protector C121														
Alpha 8011 Adhesive							4.26							
Alpha 1013 Adhesive								0.01						
Nuflex 302 Silicone														
Spray N Go Paint									0.05					
Glass Cleaner	AS	GIVEN	ABOVE											
Instant Bond White Glue														
Mastic SIA175						0.42								
Brake & Parts Cleaner										0.005	0.01	0.004		
Geocell 2320											2.57			
DAP 4000 Const Adhesive				0.23			0.23							
Elastomeric Clear Sealant							0.75						0.06	
WD-40														
Sta-put 2001 M														
3M SuperDuty Polishing Compound														
Finishing Putty														0.03
Enerbond 45 SF						0.88								
Enerbond 10 Cleaner														
Gelcoat Filon Panel White														0.09
ITW Foamseal S11608						2.26								
ITW Foamseal FSA														
Feather Rite Body Filler														0.002
Lacquer Thinner							0.01							
TOTAL				0.29	0.21	5.26	5.26	0.01	0.05	0.005	2.57	0.004	0.06	0.13

Single Highest HAP in tons per year = 5.26
 Combined HAPs in tons per year = 13.9

METHODOLOGY

PTE of HAPs (tons/year) = Density (lb/gal) * Gal of Mat. (gal/unit) * Maximum (unit/hour) * Weight % HAP * 8760 hours/year * 1 ton/2000 lbs

**Appendix A: Emissions Calculations
Particulate Emissions
From Woodworking Facility**

Company Name: Forest River, Inc. - Tsunami/Reflection Division
Address: 1800 West Hively Ave., Elkhart, Indiana 46515
Registration: 039-18657
Plt ID: 039-00307
Reviewer: ERG/SD
Date: 25-Feb-04

POTENTIAL TO EMIT IN TONS PER YEAR USING AMOUNT OF DUST COLLECTED

Emission Unit	Dust Collected (lbs/unit)	Max. Throughput Rate (units/hour)	PTE of PM/PM10 (tons/year)
Woodworking	10.00	0.25	11.1

* Assume all PM emissions are equal to PM10 emisisions

** Source generates 10 pounds of dust per unit and processes a maximum of 0.25 units per hour.

Control (Cyclone and Baghouse) = 99%

METHODOLOGY

PTE PM/PM10 (lbs/hour) = Dust collected (lbs/unit) * Max. Throughput Rate (units/hour)

PTE PM/PM10 (tons/year) = Dust collected (lbs/unit) * Max. Throughput Rate (units/hour) * 8760 hours/year * 1 ton/2000 lbs * 1/Control Efficiency %

**Appendix A: Emissions Calculations
Welding Facility**

Company Name: Forest River, Inc. - Tsunami/Reflection Division
Address: 1800 West Hively Ave., Elkhart, Indiana 46515
Registration: 039-18657
Plt ID: 039-00307
Reviewer: ERG/SD
Date: 25-Feb-04

PROCESS	Number of Stations	Max. electrode consumption per station (lbs/hr)	Emission Factors * (lb pollutant/lb electrode)				POTENTIAL TO EMIT							
			PM/PM10	Mn	Ni	Cr	PM/PM10	Mn	Ni	Cr	HAPs			
WELDING														
Metal Inert Gas (MIG)	15	2.00	2.41E-02	3.40E-05	0.00	1.00E-05								
							PTE (lbs/hour) =	0.72	1.02E-03	0.00E+00	3.00E-04	1.32E-03		
							PTE (lbs/day) =	17.4	2.45E-02	0.00E+00	7.20E-03	3.17E-02		
							PTE (tons/year) =	3.17	4.47E-03	0.00E+00	1.31E-03	5.78E-03		

Welding Emission Factors are from AP-42, Chapter 12.19

*Emission factors are default values for carbon steel unless a specific electrode type is noted in the Process column.

METHODOLOGY

PTE (lb/hour) = No. of Stations * Maximum lbs of electrode used/hour/station * Emission Factor (lb pollutant/lb of electrode used)

PTE (lbs/day) = No. of Stations * Maximum lbs of electrode used/hour/station * Emission Factor (lb pollutant/lb of electrode used) * 24 hours/day

PTE (tons/year) = No. of Stations * Maximum lbs of electrode used/hour/station * Emission Factor (lb pollutant/lb of electrode used) * 8760 hours/year * 1 ton/2000 lbs

**Appendix A: Emissions Calculations
Summary Emissions**

Company Name: Forest River, Inc. - Tsunami/Reflection Division
Address: 1800 West Hively Ave., Elkhart, Indiana 46515
Registration: 039-18657
Plt ID: 039-00307
Reviewer: ERG/SD
Date: 25-Feb-04

POTENTIAL TO EMIT BEFORE CONTROLS IN TONS PER YEAR

Emission Units	PM	PM10	SO₂	NO_x	VOC	CO	* Highest Single HAP	Total HAPs
Space Heaters	0.21	0.21	0.02	2.76	0.15	2.32	Negligible	Negligible
Surface Coating	2.54	2.54			14.2		5.26	13.9
Woodworking	11.1	11.1						
Welding	3.17	3.17						0.006
TOTAL	17.0	17.0	0.02	2.76	14.4	2.32	5.26	13.9

* MDI