

# **Statement of Basis**

**Permit to Construct No. P-2016.0047  
Project ID 61765**

**Western Idaho Cabinets, Inc.  
Boise, Idaho**

**Facility ID 001-00145**

**Final**

**December 9, 2016**  
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**Permit Writer**



The purpose of this Statement of Basis is to satisfy the requirements of IDAPA 58.01.01. et seq, Rules for the Control of Air Pollution in Idaho, for issuing air permits.

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## ACRONYMS, UNITS, AND CHEMICAL NOMENCLATURE

Btu	British thermal units
CAA	Clean Air Act
CAS No.	Chemical Abstracts Service registry number
CFR	Code of Federal Regulations
CO	carbon monoxide
CO <sub>2</sub>	carbon dioxide
CO <sub>2</sub> e	CO <sub>2</sub> equivalent emissions
DEQ	Department of Environmental Quality
EL	screening emission levels
EPA	U.S. Environmental Protection Agency
gal/day	gallons per calendar day
gal/yr	gallons per consecutive 12 calendar month period
GHG	greenhouse gases
HAP	hazardous air pollutants
IDAPA	a numbering designation for all administrative rules in Idaho promulgated in accordance with the Idaho Administrative Procedures Act
lb/hr	pounds per hour
lb/yr	pounds per consecutive 12 calendar month period
MACT	Maximum Achievable Control Technology
MMBtu/hr	million British thermal units per hour
MMscf/yr	million standard cubic feet per consecutive 12 calendar month period
NAAQS	National Ambient Air Quality Standard
NESHAP	National Emission Standards for Hazardous Air Pollutants
NO <sub>2</sub>	nitrogen dioxide
NO <sub>x</sub>	nitrogen oxides
NSPS	New Source Performance Standards
O&M	operation and maintenance
PAH	polyaromatic hydrocarbons
PM	particulate matter
PM <sub>2.5</sub>	particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers
PM <sub>10</sub>	particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers
POM	polycyclic organic matter
PSD	Prevention of Significant Deterioration
PTC	permit to construct
PTE	potential to emit
Rules	Rules for the Control of Air Pollution in Idaho
scf/yr	standard cubic feet per consecutive 12 calendar month period
SDS	Safety Data Sheet
Section 585	IDAPA 58.01.01.585 (Toxic Air Pollutants Non-Carcinogenic Increments)
Section 586	IDAPA 58.01.01.586 (Toxic Air Pollutants Carcinogenic Increments)
SO <sub>2</sub>	sulfur dioxide
T/mo	tons per calendar month
T/yr	tons per consecutive 12-calendar month period
T2	Tier II operating permit
TAP	toxic air pollutants
thm/mo	therms per calendar month
thm/yr	therms per consecutive 12 calendar month period
U.S.C.	United States Code
VOC	volatile organic compounds

## **FACILITY INFORMATION**

### ***Description***

Western Idaho Cabinets, Inc. manufactures wood kitchen and bathroom cabinets. Cutting, routing, sanding, and surface coating activities are completed at the facility in the manufacture of wood cabinets and other wood furniture. Particulate matter (PM) emissions from these activities are exhausted either to bag filters located interior to the fabrication building, or to the NFK Baghouse located outside the building. Coating operations are conducted within paint booths, with PM emissions controlled by paint booth filtration systems.

### ***Permitting History***

The following information was derived from a review of the permit files available to DEQ. Permit status is noted as active and in effect (A) or superseded (S).

September 27, 2004	P-040013, initial PTC a wood furniture manufacturing facility (A, but will become S upon issuance of this permit
March 15, 2000	001-00145, revised PTC (S)
January 3, 2000	001-00145, revised PTC (S)
September 8, 1999	001-00145, initial PTC a cabinet manufacturing facility (S)

### ***Application Scope***

This PTC is for a minor modification at an existing minor facility.

The applicant has proposed to:

- install and operate an additional paint spray booth and associated filter system, and
- increase emission and throughput limits for painting operations

### ***Application Chronology***

July 27, 2016	DEQ received an application and an application fee.
August 2 – 17, 2016	DEQ provided an opportunity to request a public comment period on the application and proposed permitting action.
August 24, 2016	DEQ determined that the application was incomplete.
September 14, 2016	DEQ received supplemental information from the applicant.
October 5, 2016	DEQ made available the draft permit and statement of basis for peer and regional office review.
October 11, 2016	DEQ determined that the application was complete.
October 11, 2016	DEQ made available the draft permit and statement of basis for applicant review.
October 31 – November 30, 2016	DEQ provided a public comment period on the proposed action.
November 7, 2016	DEQ received the permit processing fee.
December 9, 2016	DEQ issued the final permit and statement of basis.

# TECHNICAL ANALYSIS

## Emissions Units and Control Equipment

Table 1 EMISSIONS UNIT AND CONTROL EQUIPMENT INFORMATION

Source Descriptions	Control Equipment
<p><u>Paint Spray Booth #1</u>                      Manufacturer/Model: Global Finishing Solutions Wave <sup>(a)</sup>                      Maximum Operation: as limited by Paint Spray Booth Emission Limits for all booths (Table 2.2)                      Date of Construction: 10/1/2004</p>	<p><u>Filter system</u>                      Manufacturer: Global Finishing Solutions <sup>(a)</sup>                      Model: Chemco DUO filter media <sup>(a)</sup></p>
<p><u>Paint Spray Booth #2</u>                      Manufacturer/Model: Global Finishing Solutions FP-2086.125 <sup>(a)</sup>                      Maximum Operation: as limited by Paint Spray Booth Emission Limits for all booths (Table 2.2)                      Date of Construction: 10/1/2004</p>	<p><u>Filter system</u>                      Manufacturer: Global Finishing Solutions <sup>(a)</sup>                      Model: Chemco DUO filter media <sup>(a)</sup></p>
<p><u>Paint Spray Booth #3</u>                      Manufacturer/Model: Global Finishing Solutions FP-2086.125 <sup>(a)</sup>                      Maximum Operation: as limited by Paint Spray Booth Emission Limits for all booths (Table 2.2)                      Date of Construction: 10/1/2004</p>	<p><u>Filter system</u>                      Manufacturer: Global Finishing Solutions <sup>(a)</sup>                      Model: Chemco DUO filter media <sup>(a)</sup></p>
<p><u>Paint Spray Booth #4</u>                      Manufacturer/Model: Makor Automated Flatline Spray System <sup>(a)</sup>                      Maximum Operation: as limited by Paint Spray Booth Emission Limits for all booths (Table 2.2)                      Date of Construction: 6/15/2014</p>	<p><u>Filter system</u>                      Manufacturer: Global Finishing Solutions <sup>(a)</sup>                      Model: Com-Pleat PAF or Research Products 3032 filter media <sup>(a)</sup></p>
<p><u>Paint Spray Booth Spray Guns</u>                      (for Booths #1-4)</p>	<p><u>Coating spray guns</u>                      Manufacturer: Kremlin Rexson, C.A. Technologies, or equivalent                      Model: Xcite, M250, ATX, Bobcat, or equivalent                      Type: air-assisted airless, airless, HVLP, or equivalent                      Transfer Efficiency: 65% or greater</p>
<p><u>Chipper (CH1)</u>                      Manufacturer/Model: Weima WL-8 <sup>(a)</sup>                      Maximum Operation: 10.5 cubic yards of chipped materials/day (approx. 1 trailer load per day)                      Date of Construction: 7/3/2015</p>	<p><u>Cyclone (CY1)</u>                      Manufacturer: (unknown)</p>
<p>Cutting, routing, and sanding activities</p>	<p>Reasonable control of fugitive emissions                      (activities may be captured and vented to bag filters or NFK Baghouse)</p>
<p><u>Make-Up Air Unit (MAU)</u>                      Manufacturer/Model: Global Finishing Solutions CFA 36                      Maximum Capacity: 3.629 MMBtu/hr                      Date of Construction: 8/4/2004                      Fuel: natural gas</p>	<p>None</p>

**Table 1 (continued)**

<p>10 Unit Heaters (UH1-UH10) <sup>(b)</sup></p> <p>Manufacturer/Model: Space-Ray LT (U,S) 100 NS</p> <p>Maximum Capacity: 0.1 MMBtu/hr each</p> <p>Date of Construction: 10/1/2004</p> <p>Fuel: natural gas</p>	<p align="center">None</p>
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- (a) "or equivalent" equipment is equipment which has equivalent or less maximum capacity and equivalent or lower pollutant emission rates, whether calculated based on maximum design capacity or based on established permit limits. Use of replacement equipment shall not result in the emission of any regulated air pollutant not previously emitted and shall not result in an emission increase as defined in IDAPA 58.01.01.007.
- (b) Each natural gas-fired unit heater is categorically exempt from PTC permitting in accordance with IDAPA 58.01.01.222.02.c. (Fuel-burning equipment for indirect heating and for heating and reheating furnaces using natural gas exclusively with capacity less than 50 MMBtu/hr input.)

**Emissions Inventories**

**Potential to Emit**

IDAPA 58.01.01 defines Potential to Emit as the maximum capacity of a facility or stationary source to emit an air pollutant under its physical and operational design. Any physical or operational limitation on the capacity of the facility or source to emit an air pollutant, including air pollution control equipment and restrictions on hours of operation or on the type or amount of material combusted, stored or processed, shall be treated as part of its design if the limitation or the effect it would have on emissions is state or federally enforceable. Secondary emissions do not count in determining the potential to emit of a facility or stationary source.

Potential to Emit was used to determine the facility-wide emissions of criteria pollutant, hazardous air pollutant (HAP), and toxic air pollutant (TAP) emissions (see Appendix A) to demonstrate preconstruction compliance with TAP screening emission levels (EL) and "below regulatory concern" (BRC) criteria pollutant levels, and to ensure that volatile organic compounds (VOC) and HAP major source applicability thresholds were not exceeded. Emissions inventories were based on process information specific to the facility for this proposed project; natural gas combustion emission factors from AP-42;<sup>1</sup> material safety data sheets (SDS); manufacturer specification sheets for spray booth filtration and spray gun transfer efficiencies; annual fuel usage of 266,630 thm/yr for combustion units (Permit Condition 2.6); and weekly and annual coatings usage and formulations as represented in the application.

**Non-Carcinogenic and Carcinogenic TAP Emissions**

Estimated emission increases of non-carcinogenic and carcinogenic toxic air pollutants (TAP) were used to demonstrate preconstruction compliance with TAP screening emission levels (EL).

Because annual fuel usage of 266,630 thm/yr for combustion units (Permit Condition 2.6); and weekly and annual monitoring of coatings usage and calculated emission rates for compliance with emission limits (Permit Conditions 2.3 and 2.13) were required, no TAP EL specified in IDAPA 58.01.01.585–586 were expected to be exceeded by the facility (see Appendix A).

Modeling was not required for non-carcinogenic nor carcinogenic TAP, because no TAP EL were exceeded as a result of this project.

**HAP Emissions**

Estimated potential emissions of hazardous air pollutants (HAP) were used to ensure HAP major source thresholds were not exceeded.

Because annual fuel usage of 266,630 thm/yr for combustion units (Permit Condition 2.6); and weekly and annual monitoring of coatings usage and calculated emission rates for compliance with emission limits (Permit Conditions 2.3 and 2.13) were required, no individual nor combined HAP major source threshold are expected to be exceeded by the facility (see Appendix A).

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<sup>1</sup> Compilation of Air Pollutant Emission Factors, AP-42, Volume I, Fifth Edition (AP-42), Tables 1.4-1, 1.4-2, 1.4-3 and 1.4-4 in Section 1.4 – Natural Gas Combustion, Office of Air Quality Planning and Standards Office of Air and Radiation (OAQPS), EPA, July 1998.

## ***Ambient Air Quality Impact Analyses***

With the exception of VOC, the estimated emission rates of criteria pollutants (PM<sub>2.5</sub>, PM<sub>10</sub>, SO<sub>2</sub>, NO<sub>x</sub>, and CO) from this project were below regulatory concern (BRC)<sup>2</sup> and applicable screening emission levels (EL) in IDAPA 58.01.01.585-586, and modeling was not required. Refer to the Emissions Inventories section and Appendix A for additional information concerning the emission inventories.

Estimated emission increases of TAP demonstrated preconstruction compliance with TAP standards in accordance with IDAPA 58.01.01.210.08 for controlled average emission rates. Modeling analyses conducted in the development of TAP rules indicates that if a controlled average emission rate is below the applicable EL, controlled ambient concentrations are expected to be below the applicable acceptable ambient concentration. Annual fuel usage of 266,630 thm/yr for combustion units (Permit Condition 2.6); and weekly and annual monitoring of coatings usage and calculated emission rates for compliance with emission limits (Permit Conditions 2.3 and 2.13) were required in accordance with IDAPA 58.01.01.210.08.c to limit TAP emissions from coating operations, and to limit criteria pollutant emissions to below BRC threshold levels at 10% of “significant” emission rates as defined in IDAPA 58.01.01.006. Fugitive emissions from cutting, routing, and sanding activities were not included in each BRC determination.<sup>3</sup>

The applicant has demonstrated preconstruction compliance to DEQ’s satisfaction that emissions from this facility will not cause or significantly contribute to a violation of any ambient air quality standard. The applicant has also demonstrated preconstruction compliance to DEQ’s satisfaction that the emissions increase due to this permitting action will not exceed any acceptable ambient concentration (AAC) or acceptable ambient concentration for carcinogens (AACC) for toxic air pollutants (TAP).

## **REGULATORY ANALYSIS**

### ***Attainment Designation (40 CFR 81.313)***

The facility is located in Ada County, which is designated as attainment or unclassifiable for PM<sub>2.5</sub>, PM<sub>10</sub>, SO<sub>2</sub>, NO<sub>2</sub>, CO, and Ozone. Refer to 40 CFR 81.313 for additional information.

### ***Permit to Construct (IDAPA 58.01.01.201)***

The permittee requested that a revised PTC be issued to the facility for the proposed emissions sources. Therefore, a permit to construct is issued in accordance with IDAPA 58.01.01.220. This permitting action was processed in accordance with the procedures of IDAPA 58.01.01.200-228.

### ***Tier II Operating Permit (IDAPA 58.01.01.401)***

The application was submitted for a permit to construct (refer to the Permit to Construct section), and an optional Tier II operating permit has not been requested. Therefore, the procedures of IDAPA 58.01.01.400–410 were not applicable to this permitting action.

### ***Title V Classification (IDAPA 58.01.01.300, 40 CFR Part 70)***

Post-project facility-wide emissions from this facility do not have a potential to emit greater than 100 tons per year for criteria pollutants (e.g., PM<sub>2.5</sub>, PM<sub>10</sub>, SO<sub>2</sub>, NO<sub>x</sub>, CO, and VOC) or 10 tons per year for any one HAP or 25 tons per year for all HAP combined as demonstrated in the Emissions Inventories section and in Appendix A. Therefore, the facility is not a Tier I source in accordance with IDAPA 58.01.01.006 and the requirements of IDAPA 58.01.01.301 do not apply.

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<sup>2</sup> Criteria pollutant modeling published in the State of Idaho Guideline for Performing Air Quality Impact Analyses, Doc ID AQ-011 (September 2013), and BRC levels as defined in IDAPA 58.01.01.221.01.

<sup>3</sup> Fugitive emissions are defined at IDAPA 58.01.01.006.47, 40 CFR 52.21(b)(20), and 40 CFR 70.2 (2008AAF237).

**PSD Classification (40 CFR 52.21)**

The facility is not a major stationary source as defined in 40 CFR 52.21(b)(1), nor is it undergoing any physical change at a stationary source not otherwise qualifying under paragraph 40 CFR 52.21(b)(1) as a major stationary source, that would constitute a major stationary source by itself as defined in 40 CFR 52. Therefore in accordance with 40 CFR 52.21(a)(2), PSD requirements are not applicable to this permitting action. The facility is not a designated facility as defined in 40 CFR 52.21(b)(1)(i)(a), and does not have facility-wide emissions of any criteria pollutant that exceed 250 T/yr.

**NSPS Applicability (40 CFR 60)**

The facility is not subject to any NSPS requirements in 40 CFR Part 60.

**NESHAP Applicability (40 CFR 61)**

The facility is not subject to any NESHAP requirements in 40 CFR Part 61.

**MACT Applicability (40 CFR 63)**

The facility is not subject to any MACT standards in 40 CFR Part 63.

**Permit Conditions Review**

This section describes those permit conditions that have been added, revised, modified or deleted as a result of this permitting action.

Permit Conditions 1.1, 1.2, and 1.3

These permit conditions describe the scope of this permitting action.

Permit Condition 1.4

This permit condition describes the regulated sources and control equipment.

Permit Conditions 2.1 and 2.2

These permit conditions describe manufacturing activities associated with emissions, including coating operations, chipping operations, non-exempt combustion sources, and associated control equipment.

Permit Conditions 2.3, 2.13, and 2.14

*Permit Conditions 2.3 of PTC No. P-040013*

*The combined VOC emissions from paint booths 1, 2, & 3 shall not exceed 55.5 T/yr.*

*The combined PM<sub>10</sub> emissions from paint booths 1, 2, & 3 shall not exceed 0.16 T/yr.*

*Permit Condition 2.5 of PTC No. P-040013*

*Coatings and coating throughputs shall be limited to the product type and quantity listed below.*

**Table 2.2 SURFACE COATINGS THROUGHPUT LIMITS**

Coating	Usage (gal/yr)
T77PXT5173-4383: Hi Build Pre-Cat Lacquer	7,914
S64T8: Sher-wood Wiping Stain	9,219
T67F6: Sher-wood Fast Dry Vinyl Sealer	8,268

This revised permit condition establishes emission limits for PM<sub>2.5</sub>, VOC, HAP, and TAP emissions from coating operations, based on monitoring of coatings usage and calculated emission rates for compliance with emission limits (Permit Conditions 2.3 and 2.13). These limits were relied upon to demonstrate preconstruction compliance with all TAP EL; to limit HAP and VOC emissions below major source thresholds, and to demonstrate preconstruction compliance with BRC levels for PM<sub>2.5</sub> and PM<sub>10</sub>. Compliance is assured by weekly and monthly monitoring of coating material usage and emission rates (Permit Condition 2.13) and maintaining material purchase records (Permit Condition 2.14). Weekly monitoring and averaging periods were considered appropriate for Section 585 TAP, since the emissions inventory demonstrated that the maximum non-controlled TAP (n-butyl acetate) increment impact was only 18% of the screening emission level (EL). Over a 5-day workweek, estimated weekly emissions (lb) were therefore not expected to exceed daily EL-based emission limits (lb). These limits replace PM<sub>10</sub> and VOC limits in the superseded permit. Refer to the Emissions Inventories and Title V Classification (IDAPA 58.01.01.300, 40 CFR Part 70) sections for additional information.

#### Permit Conditions 2.4 and 2.11

These permit conditions incorporate odor emission limits for the facility in accordance with IDAPA 58.01.01.775-776. Compliance is assured by monitoring and responding to odor complaints (Permit Condition 2.11).

#### Permit Condition 2.5

*Permit Condition 2.4 of PTC No. P-040013*

*Emissions from the paint booth stacks, or any other stack, vent, or functionally equivalent opening associated with the facility, shall not exceed 20% opacity for a period or periods aggregating more than three minutes in any 60-minute period as required by IDAPA 58.01.01.625. Opacity shall be determined by the procedures contained in IDAPA 58.01.01.625*

This revised permit condition clarifies that the chipper and make-up air unit stacks are also applicable to opacity limits in accordance with IDAPA 58.01.01.625.

#### Permit Conditions 2.6 and 2.12

These permit conditions limit annual fuel combusted in the make-up air unit and unit heaters. These operating limits were relied upon to demonstrate preconstruction compliance with all TAP EL; to limit HAP and VOC emissions below major source thresholds, and to demonstrate preconstruction compliance with BRC levels for PM<sub>2.5</sub> and PM<sub>10</sub>. Compliance is assured by monthly monitoring of fuel usage rates (Permit Condition 2.12).

#### Permit Condition 2.7

*Permit Condition 2.8 of PTC No. P-040013*

*The permittee shall install, maintain, and operate according to the manufacturer operating specifications and recommendations, filters to control PM<sub>10</sub> emissions from Paint Booths 1, 2, and 3. The filters shall meet the capture efficiency for PM<sub>10</sub> as stated in the permit application.*

This revised permit condition requires air-assisted airless, airless, HVLP or equivalent spray guns be used and the filter systems to be operated at all times and in accordance with manufacturer's specifications when paint spray booths are operated. The particulate filtration efficiency and the coating transfer efficiency for this control equipment were used in developing the particulate HAP, TAP, PM<sub>2.5</sub>, and PM<sub>10</sub> emission inventories, and were relied upon to demonstrate preconstruction compliance with BRC levels for PM<sub>2.5</sub> and PM<sub>10</sub>.

#### Permit Condition 2.8

This permit condition requires the cyclone to be operated at all times and in accordance with manufacturer's specifications when the chipper is operated. The particulate removal efficiency for this control equipment was used in developing the particulate HAP, TAP, PM<sub>2.5</sub>, and PM<sub>10</sub> emission inventories, and was relied upon to demonstrate preconstruction compliance with BRC levels for PM<sub>2.5</sub> and PM<sub>10</sub>.

## Permit Condition 2.9

*Permit Condition 2.6 of PTC No. P-040013*

*Emissions associated with the NFK Bag Filter or equivalent shall be exhausted to the interior of the fabrication building. At no time shall emissions from the NFK Bag Filter or equivalent be exhausted to the atmosphere.*

This revised permit condition requires the NFK Baghouse to be operated in accordance with manufacturer's specifications. Location references were removed from the superseded permit condition because this filtration system is located and operated outside the fabrication building.

## **PUBLIC REVIEW**

### ***Public Comment Opportunity***

An opportunity for public comment period on the application was provided in accordance with IDAPA 58.01.01.209.01.c. During this time, there was a request for a public comment period on DEQ's proposed action. Refer to the Application Chronology section for public comment opportunity dates.

### ***Public Comment Period***

A public comment period was made available to the public in accordance with IDAPA 58.01.01.209.01.c. During this time, comments were not submitted in response to DEQ's proposed action. Refer to the Application Chronology for public comment period dates.

## APPENDIX A – EMISSION INVENTORIES

Table 2-1: MAU1 Combustion Emissions

MakeUp Air Heater Duty =

3.629 MMBtu/hr ÷

1,020 MMBtu/MMscf = 3.56E-03 MMscf/hr

Fuel Use:

Operating Assumptions:

24 hr/day

0.085 MMscf/day

5,760 hr/yr<sup>3</sup> (8 months)

20.493 MMscf/year

Criteria Air Pollutants	Emission Factor <sup>1</sup>	Emissions	
	lb/MMscf	lb/hr	T/yr
NO <sub>2</sub>	100	0.36	1.02
CO	84	0.30	0.86
PM <sub>10</sub>	7.6	0.027	0.08
PM <sub>2.5</sub>	7.6	0.027	0.08
SO <sub>2</sub>	0.6	2.1E-03	6.1E-03
VOC	5.5	2.0E-02	5.6E-02
Lead	0.0005	1.8E-06	5.1E-06
		1.3E-03	lb/month
Total Criteria Emissions (ton/yr) =			2.03

Greenhouse Gas Emissions	
CO <sub>2</sub> = 1 X 10 <sup>-3</sup> * MMBTU Gas *	53.06 kg CO <sub>2</sub> /MMBTU
CO <sub>2</sub> =	26619 Metric Tons/year
CH <sub>4</sub> = 1 X 10 <sup>-3</sup> * MMBTU Gas *	0.001 kg CH <sub>4</sub> /MMBTU
CH <sub>4</sub> =	0.502 Metric Tons/year
N <sub>2</sub> O = 1 X 10 <sup>-3</sup> * MMBTU Gas *	0.0001 kg N <sub>2</sub> O/MMBTU
N <sub>2</sub> O =	0.050 Metric Tons/year
Total CO <sub>2</sub> e = CO <sub>2</sub> + (CH <sub>4</sub> * 25) * (N <sub>2</sub> O * 298)	
CO <sub>2</sub> e =	26646 Metric Tons/year

Hazardous & Toxic Air Pollutants (HAP & TAP)	Emission Factor <sup>1</sup>	Emissions		Modeling Threshold TAP Screening Emission Level	Modeling Required?
		lb/MMscf	lb/hr <sup>2</sup>		
<b>PAH HAPs</b>					
2-Methylnaphthalene	2.40E-05	8.54E-08	2.5E-07	9.1E-05 lb/hr	No
3-Methylchloranthrene	1.80E-06	6.40E-09	1.8E-08	2.5E-06 lb/hr	No
Acenaphthene	1.80E-06	6.40E-09	1.8E-08	9.1E-05 lb/hr	No
Acenaphthylene	1.80E-06	6.40E-09	1.8E-08	9.1E-05 lb/hr	No
Anthracene	2.40E-06	8.54E-09	2.5E-08	9.1E-05 lb/hr	No
Benzo(a)anthracene	1.80E-06	6.40E-09	1.8E-08		See POM
Benzo(a)pyrene	1.20E-06	4.27E-09	1.2E-08	2.0E-06 lb/hr	See POM
Benzo(b)fluoranthene	1.80E-06	6.40E-09	1.8E-08		See POM
Benzo(g,h,i)perylene	1.20E-06	4.27E-09	1.2E-08	9.1E-05 lb/hr	No
Benzo(k)fluoranthene	1.80E-06	6.40E-09	1.8E-08		See POM
Chrysene	1.80E-06	6.40E-09	1.8E-08		See POM
Dibenzo(a,h)anthracene	1.20E-06	4.27E-09	1.2E-08		See POM
Fluoranthene	3.00E-06	1.07E-08	3.1E-08	9.1E-05 lb/hr	No
Fluorene	2.80E-06	9.96E-09	2.9E-08	9.1E-05 lb/hr	No
Indeno(1,2,3-cd)pyrene	1.80E-06	6.40E-09	1.8E-08		See POM
Naphthalene	6.10E-04	2.17E-06	6.3E-06	3.33 lb/hr	No
Naphthalene	6.10E-04	2.17E-06	6.3E-06	9.1E-05 lb/hr	No
Phenanthrene	1.70E-05	6.05E-08	1.7E-07	9.1E-05 lb/hr	No
Pyrene	5.00E-06	1.78E-08	5.1E-08	9.1E-05 lb/hr	No
Polycyclic Org. Matter (POM, 7-PAH Group)		4.06E-08	1.2E-07	2.0E-06 lb/hr	No
<b>Non-PAH HAPs</b>					
Benzene	2.10E-03	7.47E-06	2.2E-05	8.0E-04 lb/hr	No
Dichlorobenzene	1.20E-03	4.27E-06	1.2E-05	20 lb/hr	No
Formaldehyde	7.50E-02	2.67E-04	7.7E-04	5.1E-04 lb/hr	No
Hexane	1.80E+00	6.40E-03	1.8E-02	12 lb/hr	No
Toluene	3.40E-03	1.21E-05	3.5E-05	25 lb/hr	No
<b>Non-HAP Organic Compounds</b>					
Pentane	2.60E+00	9.25E-03	2.7E-02	118 lb/hr	No
<b>Metals (HAPs)</b>					
Arsenic	2.00E-04	7.12E-07	2.0E-06	1.5E-06 lb/hr	No
Barium	4.40E-03	1.57E-05	4.5E-05	0.033 lb/hr	No
Beryllium	1.20E-05	4.27E-08	1.2E-07	2.8E-05 lb/hr	No
Cadmium	1.10E-03	3.91E-06	1.1E-05	3.7E-06 lb/hr	YES
Chromium	1.40E-03	4.98E-06	1.4E-05	0.033 lb/hr	No
Cobalt	8.40E-05	2.99E-07	8.6E-07	0.0033 lb/hr	No
Copper	8.50E-04	3.02E-06	8.7E-06	0.013 lb/hr	No
Manganese	3.80E-04	1.35E-06	3.9E-06	0.067 lb/hr	No
Mercury	2.60E-04	9.25E-07	2.7E-06	0.003 lb/hr	No
Molybdenum	1.10E-03	3.91E-06	1.1E-05	0.333 lb/hr	No
Nickel	2.10E-03	7.47E-06	2.2E-05	2.7E-05 lb/hr	No
Selenium	2.40E-05	8.54E-08	2.5E-07	0.013 lb/hr	No
Vanadium	2.30E-03	8.18E-06	2.4E-05	0.003 lb/hr	No
Zinc	2.90E-02	1.03E-04	3.0E-04	0.667 lb/hr	No
Total HAP Emissions (ton/yr) =			0.020		

Notes:

1. Emission factors taken from AP-42, Section 1.4 *Natural Gas Combustion (7/98)*
2. TAPs lb/hr emissions calculations do not employ any daily or annual averaging. Bold emissions are carcinogens.
3. Booth Make-up Air heater is used only during cold weather, so subtracted out the warm-weather months of June, July, Aug, and Sept.
4. Polycyclic Organic Matter (POM) is considered as one TAP comprised of: benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, dibenzo(a,h)anthracene, chrysene, indeno(1,2,3-cd)pyrene, benzo(a)pyrene. The total is compared to benzo(a)pyrene.

**Table 2-2: Other Natural Gas Combustion Emissions**

**Indirect Air Heater Duty =**

Operating Assumptions: **1 MMBtu/hr +** **1,020 MMBtu/MMscf = 9.80E-04 MMscf/hr** **Fuel Use:**  
**24 hr/day** **0.024 MMsc**  
**5,760 hr/yr<sup>3</sup>** **(8 months)** **5.647 MMsc**

Criteria Air Pollutants	Emission Factor <sup>1</sup>	Emissions	
	lb/MMscf	lb/hr	T/yr
NO <sub>2</sub>	94	0.092	0.27
CO	40	0.039	0.11
PM <sub>10</sub>	7.6	0.0075	0.02
PM <sub>2.5</sub>	7.6	0.0075	0.02
SO <sub>2</sub>	0.6	5.9E-04	1.7E-03
VOC	5.5	5.4E-03	1.6E-02
Lead	0.0005	4.9E-07	1.4E-06
		3.5E-04	lb/month
<b>Total Criteria Emissions (ton/yr) =</b>		<b>0.42</b>	

Greenhouse Gas Emissions	
CO <sub>2</sub> = 1 X 10 <sup>-3</sup> * MMBTU Gas *	53.06 kg CO <sub>2</sub> /MMBTU
CO <sub>2</sub> =	7335 Metric Tons/year
CH <sub>4</sub> = 1 X 10 <sup>-3</sup> * MMBTU Gas *	0.001 kg CH <sub>4</sub> /MMBTU
CH <sub>4</sub> =	0.138 Metric Tons/year
N <sub>2</sub> O = 1 X 10 <sup>-3</sup> * MMBTU Gas *	0.0001 kg N <sub>2</sub> O/MMBTU
N <sub>2</sub> O =	0.014 Metric Tons/year
Total CO <sub>2</sub> e = CO <sub>2</sub> + (CH <sub>4</sub> * 25) * (N <sub>2</sub> O * 298)	
CO <sub>2</sub> e =	7343 Metric Tons/year

Hazardous & Toxic Air Pollutants (HAP & TAP)	Emission Factor <sup>1</sup>	Emissions		Modeling Threshold TAP Screening Emission Level	Modeling Required?
		lb/MMscf	lb/hr <sup>2</sup>		
<b>PAH HAPs</b>					
2-Methylnaphthalene	2.40E-05	2.35E-08	6.8E-08	9.1E-05 lb/hr	No
3-Methylchloranthrene	1.80E-06	1.76E-09	5.1E-09	2.5E-06 lb/hr	No
Acenaphthene	1.80E-06	1.76E-09	5.1E-09	9.1E-05 lb/hr	No
Acenaphthylene	1.80E-06	1.76E-09	5.1E-09	9.1E-05 lb/hr	No
Anthracene	2.40E-06	2.35E-09	6.8E-09	9.1E-05 lb/hr	No
Benzo(a)anthracene	1.80E-06	1.76E-09	5.1E-09		See POM
Benzo(a)pyrene	1.20E-06	1.18E-09	3.4E-09	2.0E-06 lb/hr	See POM
Benzo(b)fluoranthene	1.80E-06	1.76E-09	5.1E-09		See POM
Benzo(g,h,i)perylene	1.20E-06	1.18E-09	3.4E-09	9.1E-05 lb/hr	No
Benzo(k)fluoranthene	1.80E-06	1.76E-09	5.1E-09		See POM
Chrysene	1.80E-06	1.76E-09	5.1E-09		See POM
Dibenzo(a,h)anthracene	1.20E-06	1.18E-09	3.4E-09		See POM
Fluoranthene	3.00E-06	2.94E-09	8.5E-09	9.1E-05 lb/hr	No
Fluorene	2.80E-06	2.75E-09	7.9E-09	9.1E-05 lb/hr	No
Indeno(1,2,3-cd)pyrene	1.80E-06	1.76E-09	5.1E-09		See POM
Naphthalene	6.10E-04	5.98E-07	1.7E-06	3.33 lb/hr	No
Naphthalene	6.10E-04	5.98E-07	1.7E-06	9.1E-05 lb/hr	No
Phenanathrene	1.70E-05	1.67E-08	4.8E-08	9.1E-05 lb/hr	No
Pyrene	5.00E-06	4.90E-09	1.4E-08	9.1E-05 lb/hr	No
Polycyclic Org. Matter (POM, 7-PAH Group) <sup>4</sup>		1.12E-08	3.2E-08	2.0E-06 lb/hr	No
<b>Non-PAH HAPs</b>					
Benzene	2.10E-03	2.06E-06	5.9E-06	8.0E-04 lb/hr	No
Dichlorobenzene	1.20E-03	1.18E-06	3.4E-06	20 lb/hr	No
Formaldehyde	7.50E-02	7.35E-05	2.1E-04	5.1E-04 lb/hr	No
Hexane	1.80E+00	1.76E-03	5.1E-03	12 lb/hr	No
Toluene	3.40E-03	3.33E-06	9.6E-06	25 lb/hr	No
<b>Non-HAP Organic Compounds</b>					
Pentane	2.60E+00	2.55E-03	7.3E-03	118 lb/hr	No
<b>Metals (HAPs)</b>					
Arsenic	2.00E-04	1.96E-07	5.6E-07	1.5E-06 lb/hr	No
Barium	4.40E-03	4.31E-06	1.2E-05	0.033 lb/hr	No
Beryllium	1.20E-05	1.18E-08	3.4E-08	2.8E-05 lb/hr	No
Cadmium	1.10E-03	1.08E-06	3.1E-06	3.7E-06 lb/hr	No
Chromium	1.40E-03	1.37E-06	4.0E-06	0.033 lb/hr	No
Cobalt	8.40E-05	8.24E-08	2.4E-07	0.0033 lb/hr	No
Copper	8.50E-04	8.33E-07	2.4E-06	0.013 lb/hr	No
Manganese	3.80E-04	3.73E-07	1.1E-06	0.067 lb/hr	No
Mercury	2.60E-04	2.55E-07	7.3E-07	0.003 lb/hr	No
Molybdenum	1.10E-03	1.08E-06	3.1E-06	0.333 lb/hr	No
Nickel	2.10E-03	2.06E-06	5.9E-06	2.7E-05 lb/hr	No
Selenium	2.40E-05	2.35E-08	6.8E-08	0.013 lb/hr	No
Vanadium	2.30E-03	2.25E-06	6.5E-06	0.003 lb/hr	No
Zinc	2.90E-02	2.84E-05	8.2E-05	0.667 lb/hr	No
<b>Total HAP Emissions (ton/yr) =</b>		<b>0.005</b>			

Notes:

1. Emission factors taken from AP-42, Section 1.4 *Natural Gas Combustion (7/98)*
2. TAPs lb/hr emissions calculations do not employ any daily or annual averaging. Bold emissions are carcinogens.
3. Unit Heaters are used only during cold weather, so subtracted out the warm-weather months of June, July, Aug, and Sept.
4. Polycyclic Organic Matter (POM) is considered as one TAP comprised of: benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, dibenzo(a,h)anthracene, chrysene, indeno(1,2,3-cd)pyrene, benzo(a)pyrene. The total is compared to benzo(a)pyrene.

**Table 3-2: Paint Operations Emissions Summary**

Toxic Air Pollutants	CAS	Maximum Spray Rate <sup>1</sup> (lb/hr)	Spray Retention Rate <sup>2</sup> (%)	Potential to Emit (lb/hr)	Paint Filter Efficiency <sup>3</sup> (%)	Uncontrolled Emission Rate (lb/hr)
Ethanol	64-17-5	4.035	0%	4.035	0%	4.035
2-Propanol	67-63-0	2.403	0%	2.403	0%	2.403
Acetone	67-64-1	13.689	0%	13.689	0%	13.689
n-Propanol	71-23-8	1.824	0%	1.824	0%	1.824
1-Butanol	71-36-3	1.141	0%	1.141	0%	1.141
2-Methyl-1-propanol	78-83-1	2.904	0%	2.904	0%	2.904
MEK	78-93-3	0.039	0%	0.039	0%	0.039
o-Cresol	95-48-7	0.000	0%	0.0001	0%	0.000
Ethylbenzene	100-41-4	0.578	0%	0.578	0%	0.578
Methyl n-Propyl Ketone	107-87-9	0.107	0%	0.107	0%	0.107
1-Methoxy-2-propanol	107-98-2	0.009	0%	0.009	0%	0.009
Methyl Isobutyl Ketone	108-10-1	0.006	0%	0.006	0%	0.006
Isopropyl Acetate	108-21-4	0.031	0%	0.031	0%	0.031
1-Methoxy-2-Propanol Acetate	108-65-6	2.327	0%	2.327	0%	2.327
Toluene	108-88-3	0.820	0%	0.820	0%	0.820
n-Propyl Acetate	109-60-4	0.144	0%	0.144	0%	0.144
Isobutyl Acetate	110-19-0	0.257	0%	0.257	0%	0.257
Methyl n-Amyl Ketone	110-43-0	0.348	0%	0.348	0%	0.348
Diacetone Alcohol	123-42-2	0.048	0%	0.0483	0%	0.0483
n-Butyl Acetate	123-86-4	13.886	0%	13.886	0%	13.886
Xylene	1330-20-7	1.590	0%	1.590	0%	1.590
Carbon Black	1333-86-4	0.102	65%	0.036	0%	0.036
Manganese Compounds	7439-96-5	0.001	65%	0.000	0%	0.000
Chromium Compounds	7440-47-3	0.005	65%	0.002	0%	0.002
Quartz	14808-60-7	0.011	65%	0.004	0%	0.004
V. M. & P. Naphtha	64742-89-8	0.146	0%	0.146	0%	0.146
Amorphous Precipitated Silica	112926-00-8	0.000	65%	0.000	0%	0.000

Criteria Air Pollutants	Maximum Spray Rate <sup>1</sup>		Spray Retention Rate <sup>2</sup> (%)	Potential to Emit		Paint Filter Efficiency <sup>3</sup> (%)	Controlled Emissions	
	lb/hr	ton/yr		lb/hr	ton/yr		lb/hr	ton/yr
PM <sub>10</sub>	20.77	64.81	65%	7.27	22.69	98.20%	0.131	0.408
PM <sub>2.5</sub>	20.77	64.81	65%	7.27	22.69	98.20%	0.131	0.408
VOC	30.99	96.70	0%	30.99	96.70	0%	30.99	96.70

Hazardous Air Pollutants (HAP)	CAS	Maximum Spray Rate <sup>1</sup> (ton/yr)	Spray Retention Rate (%)	Potential to Emit (ton/yr)
o-Cresol	95-48-7	0.0004	0%	0.0004
Cumene	98-82-8	0.0004	0%	0.0004
Ethylbenzene	100-41-4	1.8021	0%	1.8021
Methyl Isobutyl Ketone	108-10-1	0.0191	0%	0.0191
Toluene	108-88-3	2.5573	0%	2.5573
Cobalt 2-Ethylhexanoate	136-52-7	0.01	65%	0.005
Xylene	1330-20-7	4.96	0%	4.96
Chromium Compounds	n/a	0.02	65%	0.005

Total HAPs = 9.4

Notes:

1. The maximum hourly or annual Spray Total of the WICI coatings.
2. Non-volatile emissions are calculated using a coating retention rate of 65% (airless and air-assisted spray guns).
3. Controlled non-volatile emissions (PM, not TAPs) are calculated using an exhaust filter removal efficiency of 99.94%.

**Tables 4-1a to 4-1c:  
Facility-Wide NSR Regulated Pollutant Emissions**

**Table 4-1a: Pre-Project Potential to Emit** (based on existing permit conditions)

Emissions Unit	PM <sub>2.5</sub>	PM <sub>10</sub>	SO <sub>2</sub>	NO <sub>2</sub>	CO	VOC	Lead
	tons/yr						
MAU1	0.078	0.078	0.0061	1.02	0.86	0.06	0.000005
UH's	0.00	0.00	0.000	0.00	0.00	0.00	0.000000
Paint Room	0.00	0.16	0.000	0.00	0.00	55.46	0.000000
<b>Total =</b>	<b>0.08</b>	<b>0.24</b>	<b>0.01</b>	<b>1.02</b>	<b>0.86</b>	<b>55.52</b>	<b>0.000005</b>

**Table 4-1b: Post-Project Potential to Emit** (based on requested permit conditions)

Emissions Unit	PM <sub>2.5</sub>	PM <sub>10</sub>	SO <sub>2</sub>	NO <sub>2</sub>	CO	VOC	Lead
	tons/yr						
MAU1	0.078	0.078	6.1E-03	1.02	0.86	0.056	5.1E-06
UH's	0.021	0.021	0.002	0.27	0.11	0.02	0.000001
Paint Room	0.408	0.408	0	0	0	96.70	0
Chipper	0.421	0.421	0	0	0	0.00	0
<b>Total =</b>	<b>0.93</b>	<b>0.93</b>	<b>0.008</b>	<b>1.29</b>	<b>0.97</b>	<b>96.8</b>	<b>6.5E-06</b>

**Table 4-1c: Changes in Potential to Emit**

Emissions Unit	PM <sub>2.5</sub>	PM <sub>10</sub>	SO <sub>2</sub>	NO <sub>2</sub>	CO	VOC	Lead
	tons/yr						
MAU1	0.000	0.000	0.0E+00	0.00	0.00	0.000	0.0E+00
UH's	0.021	0.021	0.002	0.265	0.113	0.016	0.000001
Paint Room	0.408	0.248	0.000	0.000	0.000	41.24	0
Chipper	0.421	0.421	0.000	0.000	0.000	0.00	0
<b>Total =</b>	<b>0.85</b>	<b>0.69</b>	<b>0.002</b>	<b>0.27</b>	<b>0.11</b>	<b>41.3</b>	<b>1.4E-06</b>

**Table 4-2:  
Facility-Wide Toxic Air Pollutant Emissions**

Non-Carcinogenic Toxic Air Pollutant (24 hr Average)	CAS	Uncontrolled Hourly Emissions		Emission Change (lb/hr)	Screening Emission Level (lb/hr)	Exceeds Screening Emission Level?
		Pre-Project (lb/hr)	Post Project (lb/hr)			
Ethanol	64-17-5	3.047	4.035	0.988	125	No
2-Propanol	67-63-0	1.876	2.403	0.527	65.3	No
Acetone	67-64-1	11.719	13.689	1.970	119	No
n-Propanol	71-23-8	0	1.824	1.824	33	No
1-Butanol	71-36-3	0.468	1.141	0.673	10	No
2-Methyl-1-propanol	78-83-1	0.937	2.904	1.967	10	No
MEK	78-93-3	4.453	0.039	-4.414	39.3	No
Naphthalene	91-20-3	0	0.000003	0.000	3.33	No
o-Cresol	95-48-7	0	0.0001	0.000	1.47	No
Cumene	98-82-8	0	0.0001	0.000	16.3	No
Ethylbenzene	100-41-4	0.234	0.578	0.344	29	No
Methyl n-Propyl Ketone	107-87-9	0	0.107	0.107	47	No
1-Methoxy-2-propanol	107-98-2	0	0.009	0.009	24	No
Methyl Isobutyl Ketone	108-10-1	0.234	0.006	-0.228	13.7	No
Isopropyl Acetate	108-21-4	0	0.031	0.031	69.3	No
1-Methoxy-2-Propanol Acetate	108-65-6	0	2.327	2.327	24	No
Toluene	108-88-3	0	0.820	0.820	25	No
n-Propyl Acetate	109-60-4	0.234	0.144	-0.090	56	No
Pentane	109-66-0	0	0.012	0.012	118	No
Isobutyl Acetate	110-19-0	2.578	0.257	-2.321	47	No
Methyl n-Amyl Ketone	110-43-0	0.703	0.348	-0.355	15.7	No
Hexane	110-54-3	0	0.008	0.008	12	No
Diacetone Alcohol	123-42-2	0	0.048	0.048	16	No
n-Butyl Acetate	123-86-4	5.391	13.886	8.495	47.3	No
Xylene	1330-20-7	1.406	1.590	0.184	29	No
Carbon Black	1333-86-4	0	0.036	0.036	0.23	No
Manganese	7439-96-5	0.000001	0.0004	0.000	0.067	No
Molybdenum	7439-98-7	0.000004	0.000005	0.000	0.333	No
Barium	7440-39-3	0.00002	0.00002	0.000	0.033	No
Chromium	7440-47-3	0.000005	0.002	0.002	0.033	No
Cobalt	7440-48-4	0.0000003	0.0000004	0.000	0.0033	No
Copper	7440-50-8	0.000003	0.000004	0.000	0.013	No
Zinc	7440-66-6	0.0001	0.0001	0.000	0.667	No
Selenium	7782-49-2	0.0000001	0.0000001	0.000	0.013	No
Quartz	14808-60-7	0	0.0039	0.0039	0.0067	No
V. M. & P. Naphtha	64742-89-8	0	0.146	0.146	91.3	No
Amorphous Precipitated Silica	112926-00-8	0.234	0.000	-0.234	0.667	No
Carcinogenic Toxic Air Pollutant (Annual Average)	CAS	Uncontrolled Hourly Emissions		Emission Change (lb/hr)	Screening Emission Level (lb/hr)	Exceeds Screening Emission Level?
		Pre-Project (lb/hr)	Post Project (lb/hr)			
Formaldehyde	50-00-0	2.7E-04	3.4E-04	7.4E-05	5.1E-04	No
Benzo(a)pyrene	50-32-8	4.3E-09	5.4E-09	1.2E-09	2.0E-06	No
3-Methylchloranthene	56-49-5	6.4E-09	8.2E-09	1.8E-09	2.5E-06	No
Benzene	71-43-2	7.5E-06	9.5E-06	2.1E-06	8.0E-04	No
Arsenic	7440-38-2	7.1E-07	9.1E-07	2.0E-07	1.5E-06	No
Beryllium	7440-41-7	4.3E-08	5.4E-08	1.2E-08	2.8E-05	No
Cadmium	7440-43-9	3.9E-06	5.0E-06	1.1E-06	3.7E-06	No
Nickel	7440-02-0	7.5E-06	9.5E-06	2.1E-06	2.7E-05	No
Polyaromatic Hydrocarbon (Max)		2.4E-06	3.0E-06	6.6E-07	9.1E-05	No
Polycyclic Organics: 7-PAH Group <sup>1</sup>		4.1E-08	5.2E-08	1.1E-08	2.0E-06	No

1. Polycyclic Organic Matter (POM) is considered as one TAP comprised of: benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, dibenzo(a,h)anthracene, chrysene, indeno(1,2,3-cd)pyrene, benzo(a)pyrene. The total is compared to benzo(a)pyrene.

**Table 4-3:  
Facility-Wide Hazardous Air Pollutant Emissions**

<b>Hazardous Air Pollutant</b>	<b>CAS</b>	<b>Potential to Emit (tons/yr)</b>
Arsenic	7440-38-2	2.6E-06
Benzene	71-43-2	2.7E-05
Beryllium	7440-41-7	1.6E-07
Cadmium	7440-43-9	1.4E-05
Chromium	7440-47-3	5.4E-03
Cobalt	7440-48-4	1.1E-06
Cobalt 2-Ethylhexanoate	136-52-7	5.2E-03
Cumene	98-82-8	4.4E-04
Dichlorobenzene	25321-22-6	1.6E-05
Ethylbenzene	100-41-4	1.8E+00
Formaldehyde	50-00-0	9.8E-04
Hexane	110-54-3	0.02
Lead		6.5E-06
Manganese	7439-96-5	5.0E-06
Mercury	7439-97-6	3.4E-06
Methyl Isobutyl Ketone	108-10-1	0.02
o-Cresol	95-48-7	0.000
Naphthalene	91-20-3	8.0E-06
Nickel	7440-02-0	2.7E-05
Polycyclic Organic Matter		1.5E-07
Selenium	7782-49-2	3.1E-07
Toluene	108-88-3	2.6
Xylene	1330-20-7	5.0
<b>TOTAL =</b>		<b>9.4</b>

Table 6-1: Site-wide NSR Criteria Summary

Criteria Air Pollutants	PTE Emissions		Significance Threshold		Below Regulatory Concern	
	lb/hr	T/yr	T/yr	Exceed?	T/yr	Exceed?
NO <sub>2</sub>	0.45	1.29	40	No	4	No
CO	0.34	0.97	100	No	10	No
PM <sub>10</sub> <sup>1</sup>	0.300	0.93	15	No	1.5	No
PM <sub>2.5</sub> <sup>1</sup>	0.300	0.93	10	No	1	No
SO <sub>2</sub>	2.7E-03	7.8E-03	40	No	4	No
VOC	31.02	96.77	40	YES	4	YES
Lead	2.3E-06	6.5E-06	0.6	No	0.06	No
<b>Total Criteria Emissions (ton/yr) =</b>		<b>99.97</b>				

<sup>1</sup> Includes 0.1295 lbs per hour of PM<sub>10</sub> and PM<sub>2.5</sub> from sawdust generated from wood grinder.

**Sawdust PM**

10.5 cu. yards fits on the trailer, emptied once per day.

4179 lbs. of sawdust cyclone bottoms/day ÷ 96% x 4% = 3.24 lbs./day = 97.16175 lbs/mo = 0.1349 lbs/hr

Conversions:

1.86% of sawdust is <100 micrometers; will assume all 1.86% is PM<sub>10</sub> and PM<sub>2.5</sub>

source: Vítěz T., Trávníček P., 2010. Particle size distribution of sawdust and wood shavings mixtures. Res. Agr. Eng., 56: 154-158.

[www.agriculturejournals.cz/publicFiles/31258.pdf](http://www.agriculturejournals.cz/publicFiles/31258.pdf)

14.75 lbs. of sawdust per cubic foot

source: Harris R., Phillips D., Feb. 1986. Density of Selected Wood Fuels. Georgia Forest Research Paper, 61.

<http://www.gfc.state.ga.us/resources/publications/research-papers/gfrp61.pdf>