

## **Statement of Basis**

**Permit to Construct No. P-2013.0032  
Project ID 62300**

**Yanke Machine Shop, Inc  
Boise, Idaho**

**Facility ID 001-00297**

**Final**

**October 3, 2019  
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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

AAC	acceptable ambient concentrations
AACC	acceptable ambient concentrations for carcinogens
acfm	actual cubic feet per minute
ASTM	American Society for Testing and Materials
BMP	best management practices
BRC	below regulatory concern as defined in IDAPA 58.01.01.221.01
Btu	British thermal units
CAA	Clean Air Act
CAS No.	Chemical Abstracts Service registry number
cfm	cubic feet per minute
CFR	Code of Federal Regulations
CO	carbon monoxide
CO <sub>2</sub>	carbon dioxide
DEQ	Department of Environmental Quality
dscf	dry standard cubic feet
EI	emissions inventories
EL	screening emission levels
EPA	U.S. Environmental Protection Agency
FCAW	Flux Cored Arc Welding
FEC	Facility Emissions Cap
FR	Federal Register
gal/yr	gallons per year
GHG	greenhouse gases
gph	gallons per hour
gpm	gallons per minute
GMAC	Gas Metal Arc Welding
gr	grains (1 lb = 7,000 grains)
HAP	hazardous air pollutants
hr/yr	hours per consecutive 12 calendar month period
IDAPA	a numbering designation for all administrative rules in Idaho promulgated in accordance with the Idaho Administrative Procedures Act
lb/hr	pounds per hour
m	meters
MACT	Maximum Achievable Control Technology
MFHAP	Metal fabrication and finishing HAP as defined in 40 CFR 63.11522
mg/dscm	milligrams per dry standard cubic meter
MMBtu	million British thermal units
MMscf	million standard cubic feet
MSDS	Material Safety Data Sheets, now called Safety Data Sheets (SDS)
NA	not applicable
NAAQS	National Ambient Air Quality Standard
NESHAP	National Emission Standards for Hazardous Air Pollutants
ND	no data
NO <sub>2</sub>	nitrogen dioxide
NO <sub>x</sub>	nitrogen oxides
NSPS	New Source Performance Standards
O&M	operation and maintenance
O <sub>2</sub>	oxygen
PAH	polyaromatic hydrocarbons
PC	permit condition
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
ppm	parts per million
ppmw	parts per million by weight
PSD	Prevention of Significant Deterioration
PTC	permit to construct
PTC/T2	permit to construct and Tier II operating permit
PTE	potential to emit
PW	process weight rate
<i>Rules</i>	<i>Rules for the Control of Air Pollution in Idaho</i>
scf	standard cubic feet
SCL	significant contribution limits
SDS	Safety Data Sheets, formerly called Material Safety Data Sheets (MSDS)
SIP	State Implementation Plan
SM	synthetic minor
SM80	synthetic minor facility with emissions greater than or equal to 80% of a major source threshold
SMAW	Shield Metal Arc Welding
SO <sub>2</sub>	sulfur dioxide
SO <sub>x</sub>	sulfur oxides
T/day	tons per calendar day
T/hr	tons per hour
T/yr	tons per consecutive 12 calendar month period
T2	Tier II operating permit
TAP	toxic air pollutants
T-RACT	Toxic Air Pollutant Reasonably Available Control Technology
ULSD	ultra-low sulfur diesel
U.S.C.	United States Code
VOC	volatile organic compounds
Yanke/YMS	Yanke Machine Shop, Inc.
yd <sup>3</sup>	cubic yards
µm	micrometers
µg/m <sup>3</sup>	micrograms per cubic meter

## **FACILITY INFORMATION**

### ***Description***

Yanke Machine Shop, Inc. (Yanke) provides metal fabrication and industrial machining services to the mining, agricultural, food processing, and power industries. The fabrication and industrial machining process involves equipment assembly, metal forming, welding and grinding, and abrasive blasting and painting.

The main sources of emissions are natural gas combustion, plasma cutting, welding and grinding, abrasive blasting, and painting.

### **Natural Gas Heaters**

YMS operates 19 natural gas heaters for comfort throughout the colder months of the year. The sizes of the units range from 0.1 to 0.361 MMBtu/hr. YMS provided the prior three years of natural gas consumption to show the sum total operation of all heaters is less than 1,000 hours per year. YMS is requesting a heater use limit of 3,120 hours per year.

### **Plasma Cutting Operation**

The YMS facility operates two plasma cutting tables and three hand held torches. Also, the Fab Shop and Machine/Repair shop buildings where plasma cutting occurs employs a three stage recirculating filtration system that provides 97% removal efficiency for particulate down to 2.5 $\mu$ m in size. Structural metals cut on the tables include mild steel, stainless steel, and aluminum.

### **Welding and Grinding**

The YMS welding operation uses Gas Metal Arc Welding (GMAC) and Flux Cored Arc Welding (FCAW). GMAC and FCAW emission factors from AP-42 Chapter 12.19 were used to estimate welding operation emissions. Welding operations occur in the Fab Shop.

YMS welds base material inside the fabrication building and inside the machine shop and repair shop building. Welding activities generate emissions. YMS uses pedestal and hand-held grinders to fabricate and repair equipment. Grinding is conducted in the same bays as welding. Currently, welding and grinding emissions are captured and controlled through three stage recirculating filtration systems that provide 97% or better capture and control efficiency for PM<sub>10</sub>/PM<sub>2.5</sub>. The roll-up or sliding doors where welding emissions can escape shall be closed during welding operations.

### **Abrasive Blasting**

YMS preps and paints some manufactured equipment. Painting preparation is accomplished using abrasive blasting. The abrasive blasting booth is located inside the abrasive blasting building. Abrasive media is comprised of either 60% of crushed glass and 40% of Kleen Blast, or 100% garnet. Emission calculations were based on a worst case scenario of use only of crushed glass and Kleen Blast. Abrasive media is fed into a hopper and delivered through two compressed air guns. Abrasive blasting is conducted in a completely enclosed booth. Two exhaust vents are located inside the abrasive blasting booth. Particulates in the air stream through these two exhaust vents are captured by an Aseco-Madsen baghouse with PM<sub>10</sub>/PM<sub>2.5</sub> control efficiency of 99.90%. The abrasive blasting building has a single horizontal exhaust stack.

The abrasive booth has a maximum daily throughput of 660 lb/hour maximum throughput during a 10 hour day with 4 hours accounting for loading, unloading, preparation, and operation maintenance. Total abrasive media purchased not to exceed 850,000 lb/yr. In addition, the permit also includes requirements in 40 CFR 63, Subpart XXXXXX because the abrasive process is subject to the subpart. Abrasive material is currently recycled twice. 6,000 lb/day of abrasive material includes the recycled materials.

### **Coating**

The coating operation is conducted in an enclosed paint booth that is located in an existing room inside the fabrication building and adjacent to the welding and grinding operations that are also located in the fabrication

building. The booth is an updraft paint booth. Particulate matter from the paint booth is vented through a series of filtered wall vents. From the wall vents, particulates are then exhausted to an outside exhaust where particulates pass through another set of filters and are eventually exhausted to the atmosphere. The paint booth filtered wall vents and the set of filters inside the outside exhaust are comprised of Flanders Pre-Pleated-40 Low Pressure Drop Filters. The filters with a MERV 11 rating capture particle size from 2.5 to 10.0 µm with 75% control efficiency.

Three paint spray guns could be used simultaneously. Yanke uses a Graco G40 AA Airless spray gun, a Binks 2100 Conventional spray gun, and a Graco Contractor 2 88420 Airless spray gun. Each gun has a material transfer efficiency of 65%.

### **Shop Space Heaters**

Yanke is comprised of three main buildings: the abrasive blasting building, the machine shop and repair shop building, and the office/fabrication building. The fabrication building also contains a parts warehouse and paint booth. Yanke utilizes a total of 19 natural gas-fired space heaters for comfort heating. The total rated heat capacity from these heaters is 5.561 MMBtu per hour. All space heater emissions are vented from roof-top exhaust vents. The space heater exhaust vents are fitted with rain-caps.

### **Emissions**

Emissions are expected to occur from the following sources:

- 19 natural gas heater stacks/vents
- Plasma cutting
- Welding and grinding
- Abrasive blasting
- One paint booth stack

### **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).

November 23, 2015 P-2013.0032, Initial PTC, Permit status (S).

May 22, 2019 P-2013.0032, PTC modification, Permit status (A), but will become (S) upon issuance of this permit.

### **Application Scope**

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

The applicant has proposed to:

- Change the grinding wheel usage from an annual quantity of wheels used to an annual weight of media used.

### **Application Chronology**

September 6, 2019 DEQ received an application and an application fee.

September 10, 2019 DEQ determined that the application was complete.

September 10, 2019 DEQ made available the draft permit and statement of basis for peer and regional office review.

September 30, 2019 DEQ received the permit processing fee.

October 3, 2019 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 ID No.	Sources	Control Equipment	Emission Point ID No.
WELD 1 and LATHE 1	<p><u>Welding</u> Type of welding: Gas Metal Arc Welding (GMAW) Flux Cored Arc Welding (FCAW)</p> <p><u>Grinding</u> Pedestal grinders Hand-held grinders</p>	<p><u>Completely Enclosed Buildings with Filtration Control Devices:</u> Manufacturer: Industrial Maid Filtration System Model: D95-MERV 15 or equivalent Type: Air filtration and ventilation with pleated filters and bag filters Control efficiency: 97.00% or greater for PM<sub>10</sub> and PM<sub>2.5</sub> Or DEQ approved alternatives</p>	<p>11 filtration control devices for fabrication shop bays 1, 2, and 3</p> <p>7 filtration control devices for fabrication shop bays 4 and 5</p> <p>7 filtration control devices for repair shop</p>
BB 1	<p><u>Abrasive Blasting</u> Manufacturer: Ruemlin Silo capacity: 6,000 lbs/day Total gun capacity: 11 lbs/min or 660 lbs/hr for two guns total</p>	<p><u>Completely Enclosed Booth with Baghouse:</u> Manufacturer: Aseco-Madsen Type: N/D Control efficiency: 99.90% or greater for PM<sub>10</sub> and PM<sub>2.5</sub></p>	<p>STCK1 Stack height: 20 ft (6.1 m) Exit diameter: 2.82 ft (0.86 m) Exit flow rate: 19,040 acfm Exit temperature: Ambient</p>
PC 1 and PC 2	<p><u>Plasma Cutting (PC 1)</u> Manufacture: Rectro Mega Hornet Model: MG21209ZR5 Type: Table with water-bath Operation: Semidry</p> <p><u>Plasma Cutting (PC 2)</u> Manufacture: ESAB Model: Unknown Type: Table with water-bath Operation: Semidry</p> <p><u>Plasma Cutting Torches</u> No. of Units: 3 Type: Hand-Held</p>	<p><u>Completely Enclosed Buildings with Filtration Control Devices:</u> Manufacturer: Industrial Maid Filtration System Model: D95-MERV 15 or equivalent Type: Air filtration and ventilation with pleated filters and bag filters Control efficiency: 97.00% or greater for PM<sub>10</sub> and PM<sub>2.5</sub> Or DEQ approved alternatives</p>	<p>3 filtration control devices for plasma bay</p>
PB 1	<p><i>Number of guns to be used simultaneously: 3</i></p> <p><u>Coating Spray Gun No. 1</u> Manufacturer: Graco or equivalent Model: G40 AA or equivalent Gun type: Airless Transfer efficiency: 65% or greater Rated capacity: 5-9 oz/min or about 4.22 gal/hr</p> <p><u>Coating Spray Gun No. 2</u> Manufacturer: Binks or equivalent Model: 2100 or equivalent Gun type: Conventional Transfer efficiency: 65% or greater Rated capacity: 5-9 oz/min or about 4.22 gal/hr</p> <p><u>Coating Spray Gun No. 3</u> Manufacturer: Graco or equivalent Model: Contractor, 2 88420 or equivalent Gun type: Airless Transfer efficiency: 65% or greater Rated capacity: 5-9 oz/min or about 4.22 gal/hr</p>	<p><u>Completely Enclosed Booth with Exhaust Filters:</u> Manufacturer: Yanke Machine Shop, Inc. Model: Merv-11 Type: updraft air filtration system Control efficiency: 75% or greater for PM<sub>10</sub> and PM<sub>2.5</sub></p> <p><u>Completely Enclosed Booth with Exhaust Filters:</u> Manufacturer: Yanke Machine Shop, Inc. Model: Merv-11 Type: updraft air filtration system Control efficiency: 75% or greater for PM<sub>10</sub> and PM<sub>2.5</sub></p>	<p>STCK2 Stack height: 32 ft (9.75 m) Exit diameter: 1.1 ft (0.3444 m) Exit flow rate: 10,450 acfm Exit temperature: Ambient</p>

Source ID No.	Sources	Control Equipment	Emission Point ID No.
FAB 1- FAB 10	<u>Natural Gas Heaters</u> No. of Units: 10 Manufacturer: Modine Model: PDP400AE0131 Manufacture Date: 2011 Heat input rating: 0.361 MMBtu/hr Fuel: Natural gas	None	<u>STCK5 &amp; STCK14</u> Ten identical ones, each stack with the following parameters:  Stack height: 27 ft (8.23 m) Exit diameter: 0.67 ft (0.2032 m) Exit flow rate: No data (rainhat) Exit temperature: 150 °F (65.6 °C)
MS 1	<u>Machine Shop Natural Gas Heaters</u> Manufacturer: Modine Model: PDP400AE0130 Manufacture Date: 2011 Heat input rating: 0.361 MMBtu/hr Fuel: Natural gas	None	<u>STCK15</u> Stack height: 24 ft (7.23 m) Exit diameter: 0.67 ft (0.2032 m) Exit flow rate: No data (rainhat) Exit temperature: 150 °F (65.6 °C)
MS 2	<u>Machine Shop Natural Gas Heaters</u> Manufacturer: Modine Model: PDP250AE0130 Manufacture Date: 2011 Heat input rating: 0.226 MMBtu/hr Fuel: Natural gas	None	<u>STCK16</u> Stack height: 24 ft (7.23 m) Exit diameter: 0.67 ft (0.2032 m) Exit flow rate: No data (rainhat) Exit temperature: 140 °F (60.0 °C)
MS 3	<u>Machine Shop Natural Gas Heaters</u> Manufacturer: Modine Model: PDP250AE0130 Manufacture Date: 2011 Heat input rating: 0.226 MMBtu/hr Fuel: Natural gas	None	<u>STCK17</u> Stack height: 24 ft (7.23 m) Exit diameter: 0.67 ft (0.2032 m) Exit flow rate: No data (rainhat) Exit temperature: 140 °F (60.0 °C)
MS 4	<u>Machine Shop Natural Gas Heaters</u> Manufacturer: Modine Model: PDP250AE0130 Manufacture Date: 2011 Heat input rating: 0.226 MMBtu/hr Fuel: Natural gas	None	<u>STCK18</u> Stack height: 24 ft (7.23 m) Exit diameter: 0.33 ft (0.1016 m) Exit flow rate: No data (rainhat) Exit temperature: 140 °F (60.0 °C)
PBH 1 and PBH 2	<u>East and West Paint Booth Natural Gas Heaters</u> Manufacturer: Bryant Model: Unknown Manufacture Date: 1980s Heat input rating: 0.10 MMBtu/hr each Fuel: Natural gas	None	<u>STCK3 and STCK4</u> Stack height: 28 ft (8.53 m) Exit diameter: 0.25 ft (0.0762 m) Exit flow rate: 1,205 acfm Exit temperature: 120 °F (49.0 °C)
WH 1	<u>Machine Shop Natural Gas Heaters</u> Manufacturer: Bryant Model: 46602 Manufacture Date: 1970-1980 Heat input rating: 0.125 MMBtu/hr Fuel: Natural gas	None	<u>STCK20</u> Stack height: 27 ft (8.23 m) Exit diameter: 0.25 ft (0.0762 m) Exit flow rate: No data (rainhat) Exit temperature: 120 °F (49.0 °C)
WH 2	<u>Machine Shop Natural Gas Heaters</u> Manufacturer: Modine Model: PDP250AE0130 Manufacture Date: 2011 Heat input rating: 0.226 MMBtu/hr Fuel: Natural gas	None	<u>STCK18</u> Stack height: 27 ft (8.23 m) Exit diameter: 0.33 ft (0.101 m) Exit flow rate: No data (rainhat) Exit temperature: 140 °F (60.0 °C)

### ***Emissions Inventories***

This permitting action did not result in a change in emissions. For the technical analysis and emissions inventory please see the statement of basis for PTC No. P-2013.0032 project 62156 issued May 22, 2019 (2019AAG777).

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

This permitting action did not require an ambient air quality impact analysis. For the current ambient air quality impact analysis please see the statement of basis for PTC No. P-2013.0032 project 62156 issued May 22, 2019.

### **REGULATORY ANALYSIS**

This permitting action did not result in a change in regulatory analysis. For the current regulatory analysis please see the statement of basis for PTC No. P-2013.0032 project 62156 issued May 22, 2019.

## ***Permit Conditions Review***

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

### **Welding and Grinding Operation; Permit Section 3**

#### **Permit Condition 3.8, Grinding Base Material Usage**

This permit condition was changed from an annual quantity of wheels used to the annual weight of grinding media used. This did not result in a change in emissions as the emissions calculated in the previous permit were based on weight of media used and this usage did not change in this permitting action, just the way the facility records the grinding wheel media usage.

#### **Permit Condition 3.11, Grinding Material Monitoring Requirement**

This permit condition was revised to record the daily, monthly, and annual grinding wheel media used from the quantity of wheels used per year to demonstrate compliance with permit condition 3.8.

#### **Permit Condition 3.12, Grinding Base Material Usage Monitoring Requirement**

This permit condition was revised to record the daily, monthly, and annual grinding wheel media used instead of the quantity of wheels used per year to demonstrate compliance with permit condition 3.8.

## **PUBLIC REVIEW**

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

An opportunity for public comment period on the application was not provided in accordance with IDAPA 58.01.01.209.01.c or IDAPA 58.01.01.404.01.c.

## **APPENDIX A – PROCESSING FEE**

## PTC Processing Fee Calculation Worksheet

**Instructions:**

Fill in the following information and answer the following questions with a Y or N. Enter the emissions increases and decreases for each pollutant in the table.

**Company:** Yanke Machine Shop, Inc.  
**Address:** 4414 S. Geckler Lane  
**City:** Boise  
**State:** Idaho  
**Zip Code:** 83716  
**Facility Contact:** John Alverson  
**Title:** Operations Manager  
**AIRS No.:** 332312

- N** Does this facility qualify for a general permit (i.e. concrete batch plant, hot-mix asphalt plant)? Y/N
- N** Did this permit require engineering analysis? Y/N
- N** Is this a PSD permit Y/N (IDAPA 58.01.01.205.04)

Emissions Inventory			
Pollutant	Annual Emissions Increase (T/yr)	Annual Emissions Reduction (T/yr)	Annual Emissions Change (T/yr)
NO <sub>x</sub>	0.0	0	0.0
SO <sub>2</sub>	0.0	0	0.0
CO	0.0	0	0.0
PM10	0.0	0	0.0
VOC	0.0	0	0.0
<b>Total:</b>	<b>0.0</b>	<b>0</b>	<b>0.0</b>
Fee Due	<b>\$ 250.00</b>		

Comments: