Statement of Basis

Permit to Construct No. P-2016.0038
Project ID 61745

YMC, Inc.
Meridian, Idaho

Facility ID 001-00417

Proposed for Public Comment

DRAFT XX, 2016
Morrie Lewis
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.

ACRONYMS, UNITS, AND CHEMICAL NOMENCLATURE **3**
FACILITY INFORMATION **4**
Description 4
Permitting History 4
Application Scope 4
Application Chronology 4
TECHNICAL ANALYSIS **5**
Emissions Units and Control Equipment 5
Emission Inventories 6
Ambient Air Quality Impact Analysis 9
REGULATORY ANALYSIS **9**
Attainment Designation (40 CFR 81.313) 9
Facility Classification 9
Permit to Construct (IDAPA 58.01.01.201) 10
Tier II Operating Permit (IDAPA 58.01.01.401) 10
Visible Emissions (IDAPA 58.01.01.625) 10
Title V Classification (IDAPA 58.01.01.300, 40 CFR Part 70) 11
PSD Classification (40 CFR 52.21) 11
NSPS Applicability (40 CFR 60) 11
NESHAP Applicability (40 CFR 61) 11
MACT Applicability (40 CFR 63) 11
Permit Conditions Review 11
PUBLIC REVIEW **13**
Public Comment Opportunity 13
Public Comment Period 13
APPENDIX A – EMISSION INVENTORIES **14**
APPENDIX B – AMBIENT AIR QUALITY IMPACT ANALYSIS **15**

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
Btu	British thermal units
CAA	Clean Air Act
cfm	cubic feet per minute
CFR	Code of Federal Regulations
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	CO_2 equivalent emissions
DEQ	Department of Environmental Quality
dscf	dry standard cubic feet
EL	screening emission levels
EPA	U.S. Environmental Protection Agency
FCAW	flux cored arc welding
GHG	greenhouse gases
GMAW	gas metal arc welding
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
MMBtu	million British thermal units
MMscf	million standard cubic feet
NAAQS	National Ambient Air Quality Standard
NESHAP	National Emission Standards for Hazardous Air Pollutants
NO_2	nitrogen dioxide
NO_x	nitrogen oxides
NSPS	New Source Performance Standards
PAH	polyaromatic hydrocarbons
PM	particulate matter
$PM_{2.5}$	particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers
PM_{10}	particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers
POM	polycyclic organic matter
ppm	parts per million
PTC	permit to construct
PTE	potential to emit
Rules	*Rules for the Control of Air Pollution in Idaho*
scf	standard cubic feet
SIP	State Implementation Plan
SM	synthetic minor
SO_2	sulfur dioxide
SO_x	sulfur oxides
T/yr	tons per consecutive 12 calendar month period
T2	Tier II operating permit
TAP	toxic air pollutants
U.S.C.	United States Code
VOC	volatile organic compounds
$\mu g/m^3$	micrograms per cubic meter

FACILITY INFORMATION

Description

YMC, Inc. conducts metal fabrication of commercial and residential heating and cooling ductwork. Emission include metal cutters, welding machines, a surface finishing machine, and natural gas-fired heaters.

Permitting History

This is the initial PTC for an existing facility that was constructed in 1988, thus there is no permitting history.

Application Scope

This permit is the initial PTC for this facility. The applicant has requested a PTC to limit emissions to below the significant emission rates for criteria pollutants.

Application Chronology

July 6, 2016	DEQ received an application.
July 7, 2016	DEQ received an application fee.
July 13 – 28, 2016	DEQ provided an opportunity to request a public comment period on the application and proposed permitting action.
August 4, 2016	DEQ determined that the application was incomplete.
August 10, 2016	DEQ made available the draft permit and statement of basis for peer and regional office review.
August 12, 2016	DEQ received supplemental information from the applicant.
August 19, 2016	DEQ determined that the application was complete.
August 19, 2016	DEQ made available the draft permit and statement of basis for applicant review.
August 30, 2016	DEQ received the permit processing fee.
October 19 – November 18, 2016	DEQ provided a public comment period on the proposed action.

TECHNICAL ANALYSIS

Emissions Units and Control Equipment

Table 1 EMISSIONS UNIT AND CONTROL EQUIPMENT INFORMATION

Emissions Unit		Control Equipment	
Laser Cutting Machine			
Manufacturer:	Mazak Laser		
Model:	Optiplex 3015 II	Robovent Fume Extraction System	
Maximum Capacity:	250 linear inches/min	Manufacturer:	Robovent
Maximum Operation:	2,024 hr/yr	Model:	Plaser 3
	(31 million linear inches/yr)		
Date of Installation:	2014		
Plasma Cutting Table			
Manufacturer:	Multicam Plasma		
Model:	3000	Robovent Fume Extraction System	
Maximum Capacity:	105 linear inches/min	Manufacturer:	Robovent
Maximum Operation:	1,250 hr/yr	Model:	Plaser 3
	(8 million linear inches/yr)		
Date of Installation:	2006		
Chop Saw			
Manufacturer/model:	Kalamazoo		
Maximum Operation:	50 hr/yr	Reasonable control of fugitive emissions	
	(0.32 million linear inches/yr)		
Date of Installation:	2001		
Welding Machines			
Manufacturer/model:	Premier Arc 6	Reasonable control of fugitive emissions	
Maximum Operation:	2,000 lb/yr FCAW electrode	(some activities may be captured and vented to fume collector)	
	2,800 lb/yr GMAW electrode		
Date of Installation:	(unknown)		
Surface Finishing Machine			
Manufacturer:	Maquinas	Wet Dust Collector	
Model:	DM1600C	Manufacturer:	ATI
Maximum Operation:	2,204 lb/yr abrasive materials	Model:	Wet Dust Collector
Date of Installation:	2016		

Infrared Radiant Tube Heaters (UH1 through UH6) Manufacturers: Renzor, Wondaice, Lennox Models: VR75, RAD100, LF24-145A-5 Maximum Capacity: 0.60 MMBtu/hr combined (0.075–0.144 MMBtu/hr each) Date of Installation: 7/2011 Fuel: natural gas	None
Heaters (UH7 through UH10) Manufacturers: Renzor Models: UDAP 150 Maximum Capacity: 0.150 MMBtu/hr each Date of Installation: 10/2009, 10/2010, and 09/2013 Fuel: natural gas	None
Radiant Heaters (UH11 through UH13) Manufacturers: Renzor Models: X3C, X3L Maximum Capacity: 0.066 MMBtu/hr each Date of Installation: (unknown) Fuel: natural gas	None
Package Units (RTU1 through RTU5) Manufacturers: York, Carrier Models: ZF036N08, 48PDGC05 Maximum Capacity: 0.30 MMBtu/hr combined (0.046 or 0.1 MMBtu/hr each) Date of Installation: (unknown) Fuel: natural gas	None

Emission 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.
Using this definition of Potential to Emit an emission inventory was developed for the Laser Cutting Machine, the Plasma Cutting Table, the Chop Saw, Surface Finishing Machine, welding machine, and heaters at the facility (see Appendix A) associated with this proposed project. Emission estimates of criteria pollutant, GHG, and HAP PTE were based on emission factors from AP-42,[1] operation of 8,760 hours per year, and process information specific to the facility for this proposed project.

[1] 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.

Uncontrolled Potential to Emit

Using the definition of Potential to Emit, uncontrolled Potential to Emit is then defined 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 **not** be treated as part of its design **since** the limitation or the effect it would have on emissions **is not** state or federally enforceable.

The uncontrolled Potential to Emit is used to determine if a facility is a "Synthetic Minor" source of emissions. Synthetic Minor sources are facilities that have an uncontrolled Potential to Emit for regulated air pollutants or HAP above the applicable Major Source threshold without permit limits.

The following table presents the uncontrolled Potential to Emit for regulated air pollutants. Uncontrolled Potential to Emit is based upon worst-case operation of the facility of 8,760 hr/yr.

Table 2 UNCONTROLLED POTENTIAL TO EMIT FOR REGULATED AIR POLLUTANTS

Process	$PM_{2.5}$	PM_{10}	NO_x	CO	VOC	SO_2	GHG	HAP
	T/yr	T/yr	T/yr	T/yr	T/yr	T/yr	T/yr	T/yr
Cutting [a]	4.05	4.05						0.34
Welding	0.05	0.05						0.05
Grinding [b]	0.66	0.66						
Combustion [c]	0.06	0.06	0.73	0.61	0.04	0.004	1,755	0.01
Totals	**4.82**	**4.82**	**0.73**	**0.61**	**0.04**	**0.004**	**1,755**	**0.41**

a) Emissions from cutting activities include emissions from the Laser Cutting Machine, Plasma Cutting Table, and Chop Saw.
b) Emissions from grinding activities include emissions from the Surface Finishing Machine.
c) Emissions from natural gas combustion include emissions from 18 heaters (i.e., infrared radiant, unit, radiant, and RTU package heaters).

Pre-Project Potential to Emit

Pre-project Potential to Emit is used to establish the change in emissions at a facility as a result of this project.

This is an existing facility. However, since this is the first time the facility is receiving a permit, pre-project emissions are set to zero for all criteria pollutants.

Post-Project Potential to Emit

Post-project Potential to Emit is used to establish the change in emissions at a facility and to determine the facility's classification as a result of this project. Post-project Potential to Emit includes all permit limits resulting from this project, including operation of Robovent and Wet Dust Collector control equipment.

The following table presents the post project Potential to Emit for criteria and GHG pollutants from all emissions units at the facility as determined by DEQ staff. See Appendix A for a detailed presentation of the calculations of these emissions for each emissions unit.

Table 3 POST-PROJECT POTENTIAL TO EMIT FOR REGULATED AIR POLLUTANTS [a]

Process	$PM_{2.5}$	PM_{10}	NO_x	CO	VOC	SO_2	GHG	HAP
	T/yr	T/yr	T/yr	T/yr	T/yr	T/yr	T/yr	T/yr
Cutting [b]	0.14	0.14						0.001
Welding	0.001	0.001						0.001
Grinding [c]	0.000001	0.000001						
Combustion [d]	0.06	0.06	0.73	0.61	0.04	0.004	1,755	0.01
Totals	**0.19**	**0.19**	**0.73**	**0.61**	**0.04**	**0.004**	**1,755**	**0.02**
BRC thresholds [e]	1.0	1.5	4.0	10	4.0	4.0		

a) Controlled average emission rates in tons per year are annual averages, based on the proposed annual operating schedule and annual limits (Permit Conditions 2.6, 3.5, and 4.5).
b) Emissions from cutting activities include emissions from the Laser Cutting Machine, Plasma Cutting Table, and Chop Saw.
c) Emissions from grinding activities include emissions from the Surface Finishing Machine.
d) Emissions from natural gas combustion include emissions from 18 heaters (i.e., infrared radiant, unit, radiant, and RTU package heaters).
e) Potential emission rates are considered "below regulatory concern" (BRC) for criteria pollutants when less than 10% of significant emission rates as defined in Section 006.

Carcinogenic and Non-Carcinogenic TAP Emissions

A summary of the estimated facility-wide PTE of carcinogenic and non-carcinogenic toxic air pollutants (TAP) is provided in the following table. With the exception of nickel, none of the EL for any carcinogenic or non-carcinogenic TAP were exceeded as a result of this project.

Table 4 POTENTIAL TO EMIT FOR TOXIC AIR POLLUTANTS

TAP	Section 585 or 586?	Emission Rate [a]	EL [b]	Exceeds EL? [b]
Benzene	586	3.48E-06	8.00E-04	No
POM [c]	586	1.89E-08	2.00E-06	No
2-Methylnapthalene [d]	586	3.97E-08	9.10E-05	No
3-Methylchloranthrene	586	2.98E-09	2.50E-06	No
Acenaphthene [d]	586	2.98E-09	9.10E-05	No
Acenaphthylene [d]	586	2.98E-09	9.10E-05	No
Anthracene [d]	586	3.97E-09	9.10E-05	No
Benzo(g,h,i)perylene [d]	586	1.99E-09	9.10E-05	No
Dichlorobenzene [d]	586	1.99E-06	9.10E-05	No
Fluoranthene [d]	586	4.97E-09	9.10E-05	No
Fluorene [d]	586	4.64E-09	9.10E-05	No
Phenanthrene [d]	586	2.81E-08	9.10E-05	No
Pyrene [d]	586	8.28E-09	9.10E-05	No
Formaldehyde	586	1.24E-04	5.10E-04	No
Naphthalene [e]	586	1.01E-06	9.10E-05	No
Arsenic	586	3.31E-07	1.50E-06	No
Beryllium	586	1.99E-08	2.80E-05	No
Cadmium	586	1.82E-06	3.70E-06	No
Nickel	586	3.06E-05	2.70E-05	Yes
Barium	585	7.28E-06	0.033	No
Chromium	585	1.13E-04	0.033	No
Chromium VI	586	6.84E-09	5.60E-07	No
Cobalt	585	9.31E-07	0.0033	No
Copper	585	1.41E-06	0.067	No
Manganese	585	6.95E-04	0.067	No
Molybdenum	585	1.82E-06	0.667	No
Selenium	585	3.97E-08	0.013	No
Vanadium	585	3.81E-06	0.003	No
Zinc	585	1.87E-03	0.667	No
Hexane	585	2.98E-03	12	No
Pentane	585	4.30E-03	118	No
Toluene	585	5.63E-06	25	No
Naphthalene	585	1.01E-06	3.33	No

a) Controlled average emission rates for 585 TAP are daily (24-hour) averages (lb/hr, 24-hour average). Controlled average emission rates for 586 TAP are annual averages (lb/hr, annual average) based on proposed annual operating limits (Permit Conditions 2.5, 3.5, and 4.5).
b) EL = screening emission levels defined in Section 585 and 586.
c) 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, and benzo(a)pyrene. The total is compared to benzo(a)pyrene.
d) These pollutants are evaluated individually against the EL for polyaromatic hydrocarbons (PAH).
e) Naphthalene was evaluated as both a Section 585 and 586 TAP, using the EL for PAH for evaluation under Section 586.

The estimated emission increase of TAP that exceeded applicable EL (nickel) was modeled to demonstrate preconstruction compliance with the applicable acceptable ambient concentration for carcinogens (AACC); refer to the Ambient Air Quality Impact Analysis section and memorandum in Appendix B for additional information.

The estimated emission increase of TAP that did not exceed applicable EL demonstrated preconstruction compliance with TAP standards in accordance with IDAPA 58.01.01.210.05 for uncontrolled average emission rates, and 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 limits (Permit Conditions 2.6, 3.5, and 4.5) were included in accordance with IDAPA 58.01.01.210.08.c to limit TAP emission from cutting, welding, and surface finishing activities.

Ambient Air Quality Impact Analysis

With the exception of nickel TAP emissions, estimated emission rates of TAP from this project were below applicable screening emission levels (EL) established in IDAPA 58.01.01.585-586 and below regulatory concern thresholds published in the State of Idaho Air Quality Modeling Guideline.[2] Refer to the Emission Inventories section for additional information concerning the emission inventories.

The estimated emission increase of TAP that exceeded applicable EL (nickel) was modeled to demonstrate preconstruction compliance with the applicable acceptable ambient concentration for carcinogens (AACC). As presented in the modeling memorandum in Appendix B, because the ambient concentration results at the point of compliance were less than or equal to applicable AACC for the modeled TAP (nickel), preconstruction compliance was demonstrated in accordance with IDAPA 58.01.01.210.08 for controlled average emission rates.

The applicant has demonstrated pre-construction 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 pre-construction 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).

An ambient air quality impact analyses document has been crafted by DEQ based on a review of the modeling analysis submitted in the application. That document is part of the final permit package for this permitting action (see Appendix B).

REGULATORY ANALYSIS

Attainment Designation (40 CFR 81.313)

The facility is located in Ada County, which is designated as attainment or unclassifiable for $PM_{2.5}$, PM_{10}, SO_2, NO_2, CO, and Ozone. Refer to 40 CFR 81.313 for additional information.

Facility Classification

The AIRS/AFS facility classification codes are as follows:

For THAP (Total Hazardous Air Pollutants) Only:

A = Use when any one HAP has actual or potential emissions $\geq$ 10 T/yr or if the aggregate of all HAP (Total HAP) has actual or potential emissions $\geq$ 25 T/yr.

SM80 = Use if a synthetic minor (potential emissions fall below applicable major source thresholds if and only if the source complies with federally enforceable limitations) and the permit sets limits $\geq$ 8 T/yr of a single HAP or $\geq$ 20 T/yr of THAP.

SM = Use if a synthetic minor (potential emissions fall below applicable major source thresholds if and only if the source complies with federally enforceable limitations) and the potential HAP emissions are limited to < 8 T/yr of a single HAP and/or < 20 T/yr of THAP.

[2] Criteria pollutant thresholds in Table 2, State of Idaho Guideline for Performing Air Quality Impact Analyses, Doc ID AQ-011, September 2013.

B = Use when the potential to emit without permit restrictions is below the 10 and 25 T/yr major source threshold

UNK = Class is unknown

For All Other Pollutants:

A = Actual or potential emissions of a pollutant are ≥ 100 T/yr.

SM80 = Use if a synthetic minor for the applicable pollutant (potential emissions fall below 100 T/yr if and only if the source complies with federally enforceable limitations) and potential emissions of the pollutant are ≥ 80 T/yr.

SM = Use if a synthetic minor for the applicable pollutant (potential emissions fall below 100 T/yr if and only if the source complies with federally enforceable limitations) and potential emissions of the pollutant are < 80 T/yr.

B = Actual and potential emissions are < 100 T/yr without permit restrictions.

UNK = Class is unknown.

Table 5 REGULATED AIR POLLUTANT FACILITY CLASSIFICATION

Pollutant	Uncontrolled PTE (T/yr)	Permitted PTE (T/yr)	Major Source Thresholds (T/yr)	AIRS/AFS Classification
PM	5	0.20	**100**	B
$PM_{10}/PM_{2.5}$	5	0.20	**100**	B
SO_2	0.005	0.005	**100**	B
NO_x	0.73	0.73	**100**	B
CO	0.61	0.61	**100**	B
VOC	0.04	0.04	**100**	B
HAP (Total)	0.5	0.02	**25**	B

Permit to Construct (IDAPA 58.01.01.201)

IDAPA 58.01.01.201..... Permit to Construct Required

The permittee has requested that a PTC be issued to the facility to limit emissions to below the significant emission rates for criteria pollutants. Therefore, a PTC may be 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)

IDAPA 58.01.01.401..... Tier II Operating Permit

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.

Visible Emissions (IDAPA 58.01.01.625)

IDAPA 58.01.01.625..... Visible Emissions

The sources of PM emissions at this facility are subject to the State of Idaho visible emissions standard of 20% opacity. This requirement was included in Permit Conditions 2.3, 3.3, and 4.3.

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

IDAPA 58.01.01.301..... Requirement to Obtain Tier I Operating Permit

Post-project facility-wide emissions from this facility do not have a potential to emit greater than 100 tons per year for criteria pollutants (i.e., PM, SO_2, NO_x, CO, VOC, and HAP) or 10 tons per year for any one HAP or 25 tons per year for all HAP combined as demonstrated previously in the Emissions Inventories section. 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.

PSD Classification (40 CFR 52.21)

40 CFR 52.21 ..... Prevention of Significant Deterioration of Air Quality

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 40 CFR Part 60.

NESHAP Applicability (40 CFR 61)

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

MACT Applicability (40 CFR 63)

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

Because the facility does metal fabrication and may conduct abrasive blasting, machining, grinding, polishing, and welding operations, NESHAP Subpart XXXXXX for Nine Metal Fabrication and Finishing Source Categories may apply to this facility (NESHAP Subpart 6X). At the time of permit issuance, all activities conducted at the facility fall under SIC code 3444 (sheet metal work) and 1711 (plumbing, heating, and air conditioning), and not under the specific SIC/NAICS code combinations that may result in applicability to NESHAP Subpart 6X.[3,4] Rationale and production data supporting that the facility is not "primarily engaged" in activities that fall under these SIC/NAICS code combinations was provided with the application in accordance with 40 CFR 63.11522 and 40 CFR 63.10(b)(3).

Permit Conditions Review

This section describes the permit conditions for this initial permit.

Permit Condition 1.1 establishes the scope of this permitting action.

Permit Condition 1.2 describes the emission sources and activities regulated by this permit.

Permit Conditions 2.1 and 2.2 describes the metal cutting processes and the control devices associated with these processes.

Permit Conditions 2.3, 3.3, and 4.3 incorporate opacity limits for the metal cutting, welding, and surface finishing processes in accordance with IDAPA 58.01.01.625.

---

[3] Nine Metal Fabrication and Finishing Source Categories – SIC/NAICS Code Applicability Charts for Nine Metal Fabrication and Finishing Sources, EPA, October 2008 (http://www.epa.gov/ttn/atw/area/arearules html#metal).

[4] At the time of this permitting action, EPA has not delegated authority to implement NESHAP Subpart 6X to the State of Idaho.

Permit Conditions 2.4 and 3.4 incorporate fugitive emission requirements for the Chop Saw and welding operations in accordance with IDAPA 58.01.01.650-651.

Permit Condition 2.5 requires operation of the Robovent at all times the Laser Cutting Machine or the Plasma Cutting Table is operated. Emission estimates used in development of the emission inventories are limited below regulatory concern assuming that each Robovent captures all emissions and achieves 99.9% control of particulate emissions from each of these sources.

Permit Condition 2.6 limits annual hours of operation of the Laser Cutting Machine, Plasma Cutting Table, and Chop Saw. Emission estimates used in development of the emission inventories are limited below regulatory concern assuming that annual operation does not exceed these limits.

Permit Condition 2.7 requires recordkeeping to ensure compliance with limits on annual hours of operation.

Permit Conditions 3.1 and 3.2 describes welding operations and the control devices associated with these operations.

Permit Condition 3.5 limits usage of electrode consumed in the welding machines. Emission estimates used in development of the emission inventories are limited below regulatory concern assuming that annual electrode usage does not exceed these limits.

Permit Condition 3.6 requires recordkeeping to ensure compliance with annual electrode usage limits.

Permit Conditions 4.1 and 4.2 describes the surface finishing process and the control device associated with this process.

Permit Condition 4.4 requires operation of the Wet Dust Collector at all times that the Surface Finishing Machine is operated. Emission estimates used in development of the emission inventories are limited below regulatory concern assuming that each Wet Dust Collector captures all emissions and achieves 99.3% control of particulate emissions from the Surface Finishing Machine.

Permit Condition 4.5 limits throughput of abrasive materials used in the Surface Finishing Machine. Emission estimates used in development of the emission inventories are limited below regulatory concern assuming that annual abrasive usage does not exceed this limit.

Permit Condition 4.6 requires recordkeeping to ensure compliance with annual abrasive material usage limits.

General Provision 5.1 (duty to comply) requires that the permittee comply with all of the permit terms and conditions pursuant to Idaho Code §39-101.

General Provision 5.2 (maintenance and operation) requires that the permittee maintain and operate all treatment and control facilities at the facility in accordance with IDAPA 58.01.01.211.

General Provision 5.3 (obligation to comply) specifies that no permit condition is intended to relieve or exempt the permittee from compliance with applicable state and federal requirements, in accordance with IDAPA 58.01.01.212.01.

General Provision 5.4 (inspection and entry) requires that the permittee allow DEQ inspection and entry pursuant to Idaho Code §39-108.

General Provision 5.5 (permit expiration construction and operation) specifies that the permit expires if construction has not begun within two years of permit issuance or if construction has been suspended for a year in accordance with IDAPA 58.01.01.211.02.

General Provision 5.6 (notification of construction and operation) provision requires that the permittee notify DEQ of the dates of construction and operation, in accordance with IDAPA 58.01.01.211.03. Although tentative dates have been provided, notifications are also required within the timeframes as specified.

General Provision 5.7 (performance testing notification of intent) requires that the permittee notify DEQ at least 15 days prior to any performance test to provide DEQ the option to have an observer present, in accordance with IDAPA 58.01.01.157.03.

General Provision 5.8 (performance test protocol) requires that any performance testing be conducted in accordance with the procedures of IDAPA 58.01.01.157, and encourages the permittee to submit a protocol to DEQ for approval prior to testing.

General Provision 5.9 (performance test report) requires that the permittee report any performance test results to DEQ within 30 days of completion, in accordance with IDAPA 58.01.01.157.04-05.

General Provision 5.10 (monitoring and recordkeeping) requires that the permittee maintain sufficient records to ensure compliance with permit conditions, in accordance with IDAPA 58.01.01.211.

General Provision 5.11 (excess emissions) requires that the permittee follow the procedures required for excess emissions events, in accordance with IDAPA 58.01.01.130-136.

General Provision 5.12 (certification) requires that a responsible official certify all documents submitted to DEQ, in accordance with IDAPA 58.01.01.123.

General Provision 5.13 (false statement) requires that no person make false statements, representations, or certifications, in accordance with IDAPA 58.01.01.125.

General Provision 5.14 (tampering) requires that no person render inaccurate any required monitoring device or method, in accordance with IDAPA 58.01.01.126.

General Provision 5.15 (transferability) specifies that this permit to construct is transferable, in accordance with the procedures of IDAPA 58.01.01.209.06.

General Provision 5.16 (severability) specifies that permit conditions are severable, in accordance with IDAPA 58.01.01.211.

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 or IDAPA 58.01.01.404.01.c. During this time, there was a request for a public comment period on DEQ's proposed action. Refer to the chronology for public comment opportunity dates.

Public Comment Period

APPENDIX A – EMISSION INVENTORIES

							PM Emissions			PM2.5/10 Emissions						
Equipment	**Volume Metal Removed by the Cut [a] (in^3/hr)**	**Total Weight of Metal Removed by Cut [a] (lbs/hr)**	**Control Method**	**Control Efficiency (%)[c]**	**Hour/ Day**	**Hours/ Year**	**Weight PM Emissions [b] (lbs/hr)**	**PM Hourly Emissions [b] (lb/hr)**	**PM Annual Emissions (tons/yr)**	**Weight PM2.5/10 Emissions[a] (lbs/hr)**	**PM2.5/10 Hourly Emissions[a] (lb/hr)**	**PM2.5/10 Annual Emissions (tons/yr)**	**Chromium (lb/hr)**	**Chromium (tons/yr)**	**Hexavalent Chromium (lb/hr)**	**Hexavalent Chromium (tons/yr)**
Laser Cutting Machine	30.00	8.35	Robovent Plaser 3	99.9%	8	2024	1 00144	0 00100	0.00101	0.50	0.0005	0.00051	6.01E-06	6.08E-06	1 32E-09	1 34E-09
Plasma Cutting Table	24.95	7.06	Robovent Plaser 3 (to be installed)	99.9%	8	1250	0 84664	0 00085	0.00053	0.42	0 21	0.13229	5.08E-06	3.17E-06	1.12E-09	6 98E-10
Abrasive Cutting (chop saw)	24.95	7.06	None	0%	0.5	50	0 84664	0 84664	0.02117	0.42	0 21	0.00529	5.08E-03	1.27E-04	1.12E-06	2.79E-08
Total Emissions									**2.27E-02**			**1.38E-01**		**1.36E-04**		**3.00E-08**
24-hr or Annual Avg (lb/hr)													**1.10E-04**			**6.84E-09**

Calculations:

(a) Average 250"/minute Laser and 105"/min plasma and chop, width of cut 0.004" Laser, 0.1" plasma and chop, stainless steel = 0.5"; galvanized gauge 20 = 0.0396" and total weight of the metal removed by the cut = density * volume [PM10Emissions = 50% PM Emissions};

(b) Total Weight Removed by Cut X 0.12 lb/lb (PM Emission Factor for plasma/laser arc cutting 0.12 lb/lb (PM10=0.5lb/lb) Cut Source test data, Appendix B, 4-24-90, P/C report, A/N 184446)

(c) MERV 16 99.9% control per manufacturer email.

References: https://yosemite.epa.gov/r9/air/epss.nsf/6924c72e5ea10d5e882561b100685e04/a5169187cd5c065088257790005d840b/$FILE/Evaluation.pdf

Additional References: http://www.npi.gov.au/sites/www.npi.gov.au/files/resources/f5095a24-5fb6-9014-3942-fbceb1c39047/files/fstfamet.pdf

Additional References: http://www.dep.wv.gov/daq/Documents/January%202015/3149-Eval.pdf

Appendix B, 4-24-90, P/C report, A/N 184446

Chromium => 0.006 lb/lb

Hex. Chromium => 0.00022 lb/lb

Ni => 0.005 lb/lb

Mn => 0.0181 lb/lb

Fe => 0.89 lb/lb

Zn => 0.1 lb/lb

Equipment	Volume Metal Removed by the Cut (a) (in^3/hr)	Nickel (lb/hr)	Nickel (tons/yr)	Manganese (lb/hr)	Manganese (tons/yr)	Iron (lb/hr)	Iron (tons/yr)	Zinc (lb/hr)	Zinc (tons/yr)
Laser Cutting Machine	30.00	5.01E-06	5.07E-06	1.81E-05	1.83E-05	8.91E-04	9.02E-04	1 00E-04	1.01E-04
Plasma Cutting Table	24.95	4.23E-06	2.65E-06	1.53E-05	9.58E-06	7.54E-04	4.71E-04	8.47E-05	5.29E-05
Abrasive Cutting (chop saw)	24.95	4.23E-03	1.06E-04	1.53E-02	3.83E-04	7.54E-01	1.88E-02	8.47E-02	2.12E-03
Total Emissions			**1.14E-04**		**4.11E-04**		**2.02E-02**		**2.27E-03**
24-hr or Annual Avg (lb/hr)			**2.59E-05**	**0.000**				**0.00**	

Calculations:

(a) Average 250"/minute Laser and 105"/min plasma and

YMC

Pollutant	Flux	Gas	Units	Flux Cored Arc Daily[a] (lb/day)	Flux Cored Arc Annual[b] (tons/yr)	Gas Metal Arc Daily[a] (lb/day)	Gas Metal Arc Annual[b] (tons/yr)	Totals Pollutant (tpy)	24-hr or Annual Average (lb/hr)[3]
	Emission Factor								
Criteria Pollutants[1]									
$PM_{2.5}/_{10}$	12.2	5 2	lb/10^3 lb	9.52E-02	5.24E-03	5.87E-03	7 34E-04	**5.97E-03**	
Hazardous Air Pollutants[2]									
Chromium	0 002	1.0E-03	lb/10^3 lb	1.56E-05	2.00E-06	1.12E-06	1.40E-07	**2.14E-06**	**6.97E-07**
Cobalt	0.001	1.0E-03	lb/10^3 lb	7.80E-06	1.00E-06	1.12E-06	1.40E-07	**1.14E-06**	**3.72E-07**
Manangese	0 662	0.318	lb/10^3 lb	5.16E-03	6.62E-04	3.56E-04	4.45E-05	**7.07E-04**	**2.30E-04**
Nickel	0.004	1.0E-03	lb/10^3 lb	3.12E-05	4.00E-06	1.12E-05	1.40E-06	**5.40E-06**	**1.23E-06**

Calculations:

(a) Daily Emissions (lb/day) = [Daily Throughput (tons/day)] x [Emission Factor (lbs/10^3 lb)] / [1,000 lbs]

(b) Annual Emissions (tons/yr) = [Annual Throughput (lb/yr) x [Emission Factor (lbs/10^3 lb)] / (2,000 lb/ton)

Daily Throughput Flux (lb/day) = 7.80 Annual Througput Flux (lb/yr) = 2,000

Daily Throughput Gas Metal (lb/day) = 11.20 Annual Througput Gas Metal (lb/yr) = 2,800

Notes:

(1) AP-42 Table 12.19-1 PM-10 Emission Factors for Welding Operations.

(2) AP-42 Table 12.19-2 HAP Emission Factors for Welding Operations.

						Emission Factors(1)								
Equipment	**Abrasive (lb/hr)**	**Abrasive (lb/year)**	**Control Method**	**Control Efficiency (%)**	**Hour/ Day**	**Total PM (lb/1,000lb abrasive)**	**PM10 (lb/1,000lb abrasive)**	**PM2.5 (lb/1,000lb abrasive)**	**Total PM (lb/hr)**	**Total PM (tpy)**	**PM10 (lb/hr)**	**PM10 (tpy)**	**PM2.5 (lb/hr)**	**PM2.5 (tpy)**
Surface Finishing Machine	62.968	2,204	ATI Wet Dust Collector	99 3%	1	0.1	0.1	0.1	4.41E-05	0.00000	4.41E-05	0.00000	4.41E-05	0 00000
Total Emissions									4.41E-05	**7.71E-07**	4.41E-05	**7.71E-07**	4.41E-05	**7.71E-07**

(1) Emission factor from AP-42 Section 12.5

Notes: 7 871 lb/ft^2, 40 ft^2/week, 280 ft^2/yr

Assumed highest lb/ft^2 between galvanized and stainless http://www armstrongmetalcrafts.com/Reference/SheetMetalGaugeWeight.aspx

Assumes 5 day work week or 8ft^2 per day and hr as 1 hr/day is the usage rate

Natural Gas Heaters

		Daily	Annual	Heat Input		Emission Factors [1][2] (lb/MMBtu)					PM2.5/10		NOx		CO		VOC		SO2	
	Equipment	Hours	Hours	(MMBTU/hr)	PM (Total)	PM10	NOx	CO	VOC	SO2	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)
UH1	Infrared Radiant Tube Heater	24	8760	0.075	7.45E-03	7.45E-03	9.80E-02	8.24E-02	5.39E-03	5.88E-04	5 59E-04	2.45E-03	7.35E-03	3.22E-02	6.18E-03	2.71E-02	4 04E-04	1.77E-03	4.41E-05	1.93E-04
UH2	Infrared Radiant Tube Heater	24	8760	0.100	7.45E-03	7.45E-03	9.80E-02	8.24E-02	5.39E-03	5.88E-04	7.45E-04	3 26E-03	9.80E-03	4.29E-02	8.24E-03	3.61E-02	5 39E-04	2.36E-03	5.88E-05	2.58E-04
UH3	Unit Heater	24	8760	0.144	7.45E-03	7.45E-03	9.80E-02	8.24E-02	5.39E-03	5.88E-04	1 07E-03	4 69E-03	1.41E-02	6.17E-02	1.18E-02	5.19E-02	7.75E-04	3.40E-03	8.46E-05	3.70E-04
UH4	Infrared Radiant Tube Heater	24	8760	0.100	7.45E-03	7.45E-03	9.80E-02	8.24E-02	5.39E-03	5.88E-04	7.45E-04	3 26E-03	9.80E-03	4.29E-02	8.24E-03	3.61E-02	5 39E-04	2.36E-03	5.88E-05	2.58E-04
UH5	Infrared Radiant Tube Heater	24	8760	0.100	7.45E-03	7.45E-03	9.80E-02	8.24E-02	5.39E-03	5.88E-04	7.45E-04	3 26E-03	9.80E-03	4.29E-02	8.24E-03	3.61E-02	5 39E-04	2.36E-03	5.88E-05	2.58E-04
UH6	Infrared Radiant Tube Heater	24	8760	0.075	7.45E-03	7.45E-03	9.80E-02	8.24E-02	5.39E-03	5.88E-04	5 59E-04	2.45E-03	7.35E-03	3.22E-02	6.18E-03	2.71E-02	4 04E-04	1.77E-03	4.41E-05	1.93E-04
UH7	Unit Heater	24	8760	0.150	7.45E-03	7.45E-03	9.80E-02	8.24E-02	5.39E-03	5.88E-04	1.12E-03	4 90E-03	1.47E-02	6.44E-02	1.24E-02	5.41E-02	8 09E-04	3.54E-03	8.82E-05	3.86E-04
UH8	Unit Heater	24	8760	0.150	7.45E-03	7.45E-03	9.80E-02	8.24E-02	5.39E-03	5.88E-04	1.12E-03	4 90E-03	1.47E-02	6.44E-02	1.24E-02	5.41E-02	8 09E-04	3.54E-03	8.82E-05	3.86E-04
UH9	Unit Heater	24	8760	0.150	7.45E-03	7.45E-03	9.80E-02	8.24E-02	5.39E-03	5.88E-04	1.12E-03	4 90E-03	1.47E-02	6.44E-02	1.24E-02	5.41E-02	8 09E-04	3.54E-03	8.82E-05	3.86E-04
UH10	Unit Heater	24	8760	0.150	7.45E-03	7.45E-03	9.80E-02	8.24E-02	5.39E-03	5.88E-04	1.12E-03	4 90E-03	1.47E-02	6.44E-02	1.24E-02	5.41E-02	8 09E-04	3.54E-03	8.82E-05	3.86E-04
UH11	Radiant Heater	24	8760	0.066	7.45E-03	7.45E-03	9.80E-02	8.24E-02	5.39E-03	5.88E-04	4 92E-04	2.15E-03	6.47E-03	2.83E-02	5.44E-03	2.38E-02	3 56E-04	1.56E-03	3.88E-05	1.70E-04
UH12	Radiant Heater	24	8760	0.066	7.45E-03	7.45E-03	9.80E-02	8.24E-02	5.39E-03	5.88E-04	4 92E-04	2.15E-03	6.47E-03	2.83E-02	5.44E-03	2.38E-02	3 56E-04	1.56E-03	3.88E-05	1.70E-04
UH13	Radiant Heater	24	8760	0.066	7.45E-03	7.45E-03	9.80E-02	8.24E-02	5.39E-03	5.88E-04	4 92E-04	2.15E-03	6.47E-03	2.83E-02	5.44E-03	2.38E-02	3 56E-04	1.56E-03	3.88E-05	1.70E-04
RTU1	RTU Package Unit	24	8760	0.100	7.45E-03	7.45E-03	9.80E-02	8.24E-02	5.39E-03	5.88E-04	7.45E-04	3 26E-03	9.80E-03	4.29E-02	8.24E-03	3.61E-02	5 39E-04	2.36E-03	5.88E-05	2.58E-04
RTU2	RTU Package Unit	24	8760	0.045	7.45E-03	7.45E-03	9.80E-02	8.24E-02	5.39E-03	5.88E-04	3 38E-04	1.48E-03	4.45E-03	1.95E-02	3.74E-03	1.64E-02	2.45E-04	1.07E-03	2.67E-05	1.17E-04
RTU3	RTU Package Unit	24	8760	0.045	7.45E-03	7.45E-03	9.80E-02	8.24E-02	5.39E-03	5.88E-04	3 38E-04	1.48E-03	4.45E-03	1.95E-02	3.74E-03	1.64E-02	2.45E-04	1.07E-03	2.67E-05	1.17E-04
RTU4	RTU Package Unit	24	8760	0.045	7.45E-03	7.45E-03	9.80E-02	8.24E-02	5.39E-03	5.88E-04	3 38E-04	1.48E-03	4.45E-03	1.95E-02	3.74E-03	1.64E-02	2.45E-04	1.07E-03	2.67E-05	1.17E-04
RTU5	RTU Package Unit	24	8760	0.061	7.45E-03	7.45E-03	9.80E-02	8.24E-02	5.39E-03	5.88E-04	4 53E-04	1 98E-03	5.96E-03	2.61E-02	5.01E-03	2.19E-02	3 28E-04	1.44E-03	3.58E-05	1.57E-04
											Totals	**5.51E-02**		**7.25E-01**		**6.09E-01**		**3.99E-02**		**4.35E-03**

[1] Emission factor from AP-42 Section 1.4 Natural Gas Combustion, Table 1.4-1& 1.4-2

[2] To convert from lb/10^6 scf to lb/MMBtu, the lb/10^6 scf emission factor is divided by the average heating value of 1,020 Btu/scf.

Non Metal HAP[2]	CAS	EF (lb/MMscf)	lb/hr	PTE T/yr	Actutal T/yr
Benzene	71-43-2	2.10E-03	3.48E-06	1.52E-05	1 52E-05
Dichlorobenzene	25321-22-6	1 20E-03	1.99E-06	8.70E-06	8.70E-06
Formaldehyde	50-00-0	7 50E-02	1.24E-04	5.44E-04	5.44E-04
Hexane	110-54-3	1 80E+00	2.98E-03	1.31E-02	1 31E-02
Naphthalene	91-20-3	6.10E-04	1.01E-06	4.42E-06	4.42E-06
Toluene	108-88-3	3.40E-03	5.63E-06	2.47E-05	2.47E-05
2-Methylnapthalene[1]	91-57-6	2.40E-05	3.97E-08	1.74E-07	1.74E-07
3-Methylchloranthrene[1]	56-49-5	1 80E-06	2.98E-09	1.31E-08	1 31E-08
7,12-Dimethylbenz(a)anthracene[1]		1 60E-05	2.65E-08	1.16E-07	1.16E-07
Acenaphthene[1]	83-32-9	1 80E-06	2.98E-09	1.31E-08	1 31E-08
Acenaphthylene[1]	203-96-8	1 80E-06	2.98E-09	1.31E-08	1 31E-08
Anthracene[1]	120-12-7	2.40E-06	3.97E-09	1.74E-08	1.74E-08
Benz(a)anthracene[1]	56-55-3	1 80E-06	2.98E-09	1.31E-08	1 31E-08
Benzo(a)pyrene[1]	50-32-8	1 20E-06	1.99E-09	8.70E-09	8.70E-09
Benzo(b)fluoranthene[1]	205-99-2	1 80E-06	2.98E-09	1.31E-08	1 31E-08
Benzo(g,h,i)perylene[1]	191-24-2	1 20E-06	1.99E-09	8.70E-09	8.70E-09
Benzo(k)fluoranthene[1]	205-82-3	1 80E-06	2.98E-09	1.31E-08	1 31E-08
Chrysene[1]	218-01-9	1 80E-06	2.98E-09	1.31E-08	1 31E-08
Dibenzo(a,h)anthracene[1]	53-70-3	1 20E-06	1.99E-09	8.70E-09	8.70E-09
Dichlorobenzene[1]	25321-22-6	1 20E-03	1.99E-06	8.70E-06	8.70E-06
Fluoranthene[1]	206-44-0	3 00E-06	4.97E-09	2.18E-08	2.18E-08
Fluorene[1]	86-73-7	2 80E-06	4.64E-09	2.03E-08	2 03E-08
Indeno(1,2,3-cd)pyrene[1]	193-39-5	1 80E-06	2.98E-09	1.31E-08	1 31E-08
Phenanathrene[1]	85-01-8	1.70E-05	2.81E-08	1.23E-07	1 23E-07
Pyrene[1]	129-00-0	5 00E-06	8.28E-09	3.63E-08	3 63E-08

1. The pollutant is a HAP because it is considered a polycyclic organic matter (POM).
2. Emission factors are based on AP-42 (1998), Section 1.4, Natural Gas Combustion, Table 1.4-3.

Metal HAP[1]	CAS	EF (lb/MMscf)	lb/hr	PTE T/yr	Actual T/yr
Arsenic	7440-38-2	2 00E-04	3.31E-07	1.45E-06	1.45E-06
Beryllium	7440-41-7	1 20E-05	1.99E-08	8.70E-08	8.70E-08
Cadmium	7440-43-9	1.10E-03	1.82E-06	7.98E-06	7 98E-06
Chromium	7440-47-3	1.40E-03	2.32E-06	1.02E-05	1 02E-05
Cobalt	7440-48-4	8.40E-05	1.39E-07	6.09E-07	6 09E-07
Lead	7439-92-1	5 00E-04	8.28E-07	3.63E-06	3 63E-06
Manganese	7439-96-5	3 80E-04	6.29E-07	2.76E-06	2.76E-06
Mercury	7439-97-6	2 60E-04	4.30E-07	1.89E-06	1 89E-06
Molybdenum	7439-98-7	1.10E-03	1.82E-06	7.98E-06	7 98E-06
Nickel	7440-02-0	2.10E-03	3.48E-06	1.52E-05	1 52E-05
Selenium	7782-49-2	2.40E-05	3.97E-08	1.74E-07	1.74E-07

1. Emission factors are based on AP-42 (1998), Section 1.4, Natural Gas Combustion, Table 1.4-4.

Total HAP	**3.13E-03**	**1.37E-02**	**1.37E-02**

Idaho State TAP	CAS	585/586	EF (lb/MMscf)	Max lb/hr	PTE Max (T/yr)	Actual Max (T/yr)	24-hr or Annual Average (lb/hr)[3]
Benzene	71-43-2	586	2.10E-03	3.48E-06	1 52E-05	1 52E-05	3.48E-06
POM[1]		586	1.14E-05	1.89E-08	8 27E-08	8 27E-08	1.89E-08
2-Methylnapthalene[2]	91-57-6	586	2.40E-05	3.97E-08	1.74E-07	1.74E-07	3.97E-08
3-Methylchloranthrene	56-49-5	586	1.80E-06	2.98E-09	1 31E-08	1 31E-08	2.98E-09
Acenaphthene[2]	83-32-9	586	1.80E-06	2.98E-09	1 31E-08	1 31E-08	2.98E-09
Acenaphthylene[2]	203-96-8	586	1.80E-06	2.98E-09	1 31E-08	1 31E-08	2.98E-09
Anthracene[2]	120-12-7	586	2.40E-06	3.97E-09	1.74E-08	1.74E-08	3.97E-09
Benzo(g,h,i)perylene[2]	191-24-2	586	1.20E-06	1.99E-09	8.70E-09	8.70E-09	1.99E-09
Dichlorobenzene[2]	25321-22-6	586	1.20E-03	1.99E-06	8.70E-06	8.70E-06	1.99E-06
Fluoranthene[2]	206-44-0	586	3.00E-06	4.97E-09	2.18E-08	2.18E-08	4.97E-09
Fluorene[2]	86-73-7	586	2.80E-06	4.64E-09	2 03E-08	2 03E-08	4.64E-09
Phenanathrene[2]	85-01-8	586	1.70E-05	2.81E-08	1 23E-07	1 23E-07	2.81E-08
Pyrene[2]	129-00-0	586	5.00E-06	8.28E-09	3 63E-08	3 63E-08	8.28E-09
Formaldehyde	50-00-0	586	7.50E-02	1.24E-04	5.44E-04	5.44E-04	1.24E-04
Napthalene	91-20-3	586	6.10E-04	1.01E-06	4.42E-06	4.42E-06	1.01E-06
Arsenic	7440-38-2	586	2.00E-04	3.31E-07	1.45E-06	1.45E-06	3.31E-07
Beryllium	7440-41-7	586	1.20E-05	1.99E-08	8.70E-08	8.70E-08	1.99E-08
Cadmium	7440-43-9	586	1.10E-03	1.82E-06	7 98E-06	7 98E-06	1.82E-06
Nickel	7440-02-0	586	2.10E-03	3.48E-06	1 52E-05	1 52E-05	3.48E-06
Barium	7440-39-3	585	4.40E-03	7.28E-06	3.19E-05	3.19E-05	7.28E-06
Chromium	7440-47-3	585	1.40E-03	2.32E-06	1 02E-05	1 02E-05	2.32E-06
Cobalt	7440-48-4	585	8.40E-05	1.39E-07	6 09E-07	6 09E-07	1.39E-07
Copper	7440-50-8	585	8.50E-04	1.41E-06	6.16E-06	6.16E-06	1.41E-06
Manganese	7439-96-5	585	3.80E-04	6.29E-07	2.76E-06	2.76E-06	6.29E-07
Molybdenum	7439-98-7	585	1.10E-03	1.82E-06	7 98E-06	7 98E-06	1.82E-06
Selenium	7782-49-2	585	2.40E-05	3.97E-08	1.74E-07	1.74E-07	3.97E-08
Vanadium	7440-62-2	585	2.30E-03	3.81E-06	1 67E-05	1 67E-05	3.81E-06
Zinc	7440-66-6	585	2.90E-02	4.80E-05	2.10E-04	2.10E-04	4.80E-05
Hexane	110-54-3	585	1.80E+00	2.98E-03	1 31E-02	1 31E-02	2.98E-03
Pentane	109-66-0	585	2.60E+00	4.30E-03	1 89E-02	1 89E-02	4.30E-03
Toluene	108-88-3	585	3.40E-03	5.63E-06	2.47E-05	2.47E-05	5.63E-06
Napthalene	91-20-3	585	6.10E-04	1.01E-06	4.42E-06	4.42E-06	1.01E-06

1. POM is the combination of benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene and indeno(1,2,3-cd)pyrene.
and are compared against the emission level of benzo(a)pyrene.

2. These pollutants are evaluated individua ly against the PAH emission level.

3. 585 is based on 24-hr average and 586 pollutants are annual averages

			24-hr or Annual Average (lb/hr)					
Idaho State TAP	**CAS**	**585/586**	**NG Heaters**	**Welding**	**Cutting**	**Total**	**EL**	**Modeling?**
Benzene	71-43-2	586	3.48E-06			3.48E-06	8.00E-04	No
POM[1]	0	586	1.89E-08			1 89E-08	2.00E-06	No
2-Methylnapthalene[2]	91-57-6	586	3.97E-08			3 97E-08	9.10E-05	No
3-Methylchloranthrene	56-49-5	586	2.98E-09			2 98E-09	2.50E-06	No
Acenaphthene[2]	83-32-9	586	2.98E-09			2 98E-09	9.10E-05	No
Acenaphthylene[2]	203-96-8	586	2.98E-09			2 98E-09	9.10E-05	No
Anthracene[2]	120-12-7	586	3.97E-09			3 97E-09	9.10E-05	No
Benzo(g,h,i)perylene[2]	191-24-2	586	1.99E-09			1 99E-09	9.10E-05	No
Dichlorobenzene[2]	25321-22-6	586	1.99E-06			1 99E-06	9.10E-05	No
Fluoranthene[2]	206-44-0	586	4.97E-09			4 97E-09	9.10E-05	No
Fluorene[2]	86-73-7	586	4.64E-09			4 64E-09	9.10E-05	No
Phenanathrene[2]	85-01-8	586	2.81E-08			2 81E-08	9.10E-05	No
Pyrene[2]	129-00-0	586	8.28E-09			8 28E-09	9.10E-05	No
Formaldehyde	50-00-0	586	1.24E-04			1 24E-04	5.10E-04	No
Napthalene[3]	91-20-3	586	1.01E-06			1 01E-06	9.10E-05	No
Arsenic	7440-38-2	586	3.31E-07			3 31E-07	1 50E-06	No
Beryllium	7440-41-7	586	1.99E-08			1 99E-08	2 80E-05	No
Cadmium	7440-43-9	586	1.82E-06			1 82E-06	3.70E-06	No
Nickel	7440-02-0	586	3.48E-06	1.23E-06	2.59E-05	3 06E-05	2.70E-05	Yes
Barium	7440-39-3	585	7.28E-06			7 28E-06	0.033	No
Chromium	7440-47-3	585	2.32E-06	6.97E-07	1.10E-04	1.13E-04	0.033	No
Chromium VI	18540-29-9	586			6.84E-09	6 84E-09	5 60E-07	No
Cobalt	7440-48-4	585	1.39E-07	3.72E-07		5.11E-07	0 0033	No
Copper	7440-50-8	585	1.41E-06			1.41E-06	0.067	No
Manganese	7439-96-5	585	6.29E-07	2.30E-04	3.30E-04	5 61E-04	0.067	No
Molybdenum	7439-98-7	585	1.82E-06			1 82E-06	0.667	No
Selenium	7782-49-2	585	3.97E-08			3 97E-08	0.013	No
Vanadium	7440-62-2	585	3.81E-06			3 81E-06	0.003	No
Zinc	7440-66-6	585	4.80E-05		1.83E-03	1 87E-03	0.667	No
Hexane	110-54-3	585	2.98E-03			2 98E-03	12	No
Pentane	109-66-0	585	4.30E-03			4 30E-03	118	No
Toluene	108-88-3	585	5.63E-06			5 63E-06	25	No
Napthalene	91-20-3	585	1.01E-06			1 01E-06	3.33	No

1. POM is the combination of benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene and indeno(1,2,3-cd)pyrene. and are compared against the emission level of benzo(a)pyrene.

2. These pollutants are evaluated individually against the PAH emission level.

3. Naphthalene is considered both a 585 and 586 TAP. The 586 comparison threshold is the PAH EL.

GHG Emission Factors	
Natural Gas	kg/MMBtu
CO2	53 06
CH4	1
N2O	0.1

* 40 CFR part 98 Subpart C

https://www.epa.gov/sites/production/files/2015-12/documents/emission-factors_nov_2015.pdf

	GHG PTE				GHG Actuals			
	metric tons per year				metric tons per year			
	CO2	**CH4**	**N2O**	**CO2e***	**CO2**	**CH4**	**N2O**	**CO2e***
UH1	34.79	0.66	6.6E-02	71	34.79	0.66	6.6E-02	71
UH2	46 38	0.87	8.7E-02	94	46.38	0.87	8.7E-02	94
UH3	66 68	1.26	1.3E-01	136	66.68	1.26	1.3E-01	136
UH4	46 38	0.87	8.7E-02	94	46.38	0.87	8.7E-02	94
UH5	46 38	0.87	8.7E-02	94	46.38	0.87	8.7E-02	94
UH6	34.79	0.66	6.6E-02	71	34.79	0.66	6.6E-02	71
UH7	69 57	1.31	1.3E-01	141	69.57	1.31	1.3E-01	141
UH8	69 57	1.31	1.3E-01	141	69.57	1.31	1.3E-01	141
UH9	69 57	1.31	1.3E-01	141	69.57	1.31	1.3E-01	141
UH10	69 57	1.31	1.3E-01	141	69.57	1.31	1.3E-01	141
UH11	30 61	0.58	5.8E-02	62	30.61	0.58	5.8E-02	62
UH12	30 61	0.58	5.8E-02	62	30.61	0.58	5.8E-02	62
UH13	30 61	0.58	5.8E-02	62	30.61	0.58	5.8E-02	62
RTU1	46 38	0.87	8.7E-02	94	46.38	0.87	8.7E-02	94
RTU2	21 06	0.40	4.0E-02	43	21.06	0.40	4.0E-02	43
RTU3	21 06	0.40	4.0E-02	43	21.06	0.40	4.0E-02	43
RTU4	21 06	0.40	4.0E-02	43	21.06	0.40	4.0E-02	43
RTU5	28 20	0.53	5.3E-02	57	28.20	0.53	5.3E-02	57
Total	**783**	**14.8**	**1.5**	**1,592**	**783**	**14.8**	**1.5**	**1,592**

* Applies GWP values of 1, 25 and 298 as defined in Appendix C of Part 98.

Process	PM2.5	PM10	NOx	CO	VOC	SO2	GHG	HAPs
	T/yr	T/yr	T/yr	T/yr	T/yr	T/yr	mT/yr	T/yr
Cutting Emissions	1.38E-01	1.38E-01						6.61E-04
Welding	5.97E-03	5.97E-03						7.15E-04
Grinding	7.71E-07	7.71E-07						
NG Combustion	5.51E-02	5.51E-02	7 25E-01	6.09E-01	3.99E-02	4.35E-03	1,592	1.37E-02
Totals	**0.199**	**0.199**	**0.725**	**0.609**	**3.99E-02**	**4.35E-03**	**1592**	**1.51E-02**

APPENDIX B – AMBIENT AIR QUALITY IMPACT ANALYSIS

M E M O R A N D U M /DRAFT

DATE: **September 19**, 2016

TO: **Morrie Lewis**, Permit Writer, Air Program

FROM: Thomas Swain, Air Quality Modeler, Analyst 3, Air Program

PROJECT: YMC, Inc., (YMC), in Meridian, Idaho, Permit to Construct (PTC), P-2016.0038

SUBJECT: Demonstration of Compliance with IDAPA 58.01.01.203.02 (NAAQS) and 203.03 (TAPs) as it relates to air quality impact analyses.

Contents

1.0 Summary **3**

2.0 Background Information **4**

2.1 Project Description 4

2.2 Proposed Location and Area Classification 4

2.3 Air Impact Analysis Required for All Permits to Construct 5

2.4 Significant Impact Level and Cumulative NAAQS Impact Analyses 5

2.4 Toxic Air Pollutant Analysis 8

3.0 Analytical Methods and Data 8

3.1 Emissions Source Data 8

3.1.1. Criteria Pollutant Emissions Rates and Modeling Applicability 9

3.1.2. Toxic Air Pollutant Emissions Rates 11

3.1.3. Emissions Release Parameters 12

3.2 Background Concentrations 13

3.3 Impact Modeling Methodology 14

3.3.1. General Overview of Analysis 14

3.3.2 Modeling Protocol and Methodology 14

3.3.3 Model Selection 15

3.3.4 Meteorological Data 15

3.3.5 Effects of Terrain on Modeled Impacts 15

3.3.6 Facility Layout 15

3.3.7 Effects of Building Downwash on Modeled Impacts 15

3.3.8 Ambient Air Boundary 16
3.3.9 Receptor Network 16
3.3.10 Good Engineering Practice Stack Height 16
4.0 Impact Modeling Results **16**
4.1 Results for NAAQS Significant Impact Level Analyses 16
4.2 Results for TAPs Impact Analyses 16
5.0 Conclusions 16

1.0 Summary

YMC Inc., (YMC), submitted an application for a Permit to Construct (PTC) on July 7, 2016 for an existing facility located in Meridian, Idaho.

YMC is an existing metal fabrication facility of commercial and residential heating and cooling ductwork. The facility is located at 2975 E Lanark St in Meridian, Idaho. They have been operating since 1988, and have not obtained a permit in the past. The primary emphasis of the facility is fabrication of sheet metal products. The processes include welding, shearing, cutting, and forming metal, most of which is galvanized and stainless steel. This permit addresses facility-wide emissions that include metal cutters, welding operations, surface finishing, and natural gas-fired heaters.

The entire process is discussed in detail in the main body of the DEQ Statement of Basis supporting the issued proposed PTC. This modeling review memorandum provides a summary and approval of the ambient air impact analyses submitted with the permit application. It also describes DEQ's review of those analyses, DEQ's verification analyses, additional clarifications, and conclusions.

Project-specific air quality impact analyses involving atmospheric dispersion modeling of estimated emissions associated with the facility were submitted to DEQ to demonstrate that the facility would not cause or significantly contribute to a violation of any ambient air quality standard as required by IDAPA 58.01.01.203.02 and 203.03 (Idaho Air Rules Section 203.02 and 203.03).

Stantec Consulting Services, Ltd. (STANTEC) performed the ambient air impact analyses for this project on behalf of YMC. The analyses were performed to demonstrate compliance with air quality standards. The DEQ review summarized by this memorandum addressed only the rules, policies, methods, and data pertaining to the air impact analyses used to demonstrate that the estimated emissions increases at the facility associated with the proposed project will not cause or significantly contribute to a violation of any applicable air quality standard. This review did not evaluate compliance with other rules or analyses that do not pertain to the air impact analyses. Evaluation of emissions estimates was the responsibility of the permit writer and is addressed in the main body of the Statement of Basis. Emissions estimates were not reviewed as part of the modeling review described in this modeling review memorandum.

A modeling protocol was not submitted for this project. An initial application was submitted on July 7, 2016. DEQ responded with a letter of incompleteness on August 5, 2016. This was largely due to missing forms and permitting issues. The only DEQ-identified issue regarding the air impact analyses was a request for a clarification on the ambient boundary of the facility. YMC responded with a satisfactory explanation of the ambient boundary on August 12, and DEQ issued a completeness determination on August 17, 2016.

The final submitted air quality impact analyses: 1) utilized appropriate methods and models; 2) was conducted using reasonably accurate or conservative model parameters and input data (review of emissions estimates was addressed by the DEQ permit writer); 3) adhered to established DEQ guidelines for new source review dispersion modeling; 4) showed either a) that predicted pollutant concentrations from emissions associated with the project as modeled were below Significant Impact Levels (SILs) or other applicable regulatory thresholds; or b) that predicted pollutant concentrations from emissions associated with the project as modeled, when appropriately combined with co-contributing sources and background concentrations, were below applicable National Ambient Air Quality Standards (NAAQS) at ambient air locations where and when the project has a significant impact; 5) showed that Toxic Air Pollutant (TAP) emissions increases associated with the project will not result in increased ambient air impacts exceeding allowable TAP increments.

Table 1 presents key assumptions and results to be considered in the development of the permit.

Air impact analyses are required by Idaho Air Rules to be conducted according to methods outlined in 40 CFR 51, Appendix W (*Guideline on Air Quality Models*). Appendix W requires that facilities be modeled using emissions and operations representative of design capacity or as limited by a federally enforceable permit condition. The submitted information and analyses demonstrated to the satisfaction of the Department that operation of the proposed facility will not cause or significantly contribute to a violation of any ambient air quality standard, provided the key conditions in Table 1 are representative of facility design capacity or operations as limited by a federally enforceable permit condition.

Table 1. KEY ASSUMPTIONS USED IN MODELING ANALYSES

Criteria/Assumption/Result	Explanation/Consideration
General Emissions Rates. Emissions rates used in the modeling analyses, as listed in this memorandum, represent maximum potential emissions as given by design capacity or as limited by the issued permit for the specific pollutant and averaging period.	Compliance has not been demonstrated for emissions rates greater than those used in the modeling analyses.
Modeling Thresholds for Criteria Pollutant Emissions. Maximum short-term and long-term emissions of PM_{10}, $PM_{2.5}$, SO_2, CO, and oxides of nitrogen (NOx) associated with the proposed project are below the BRC for each pollutant. Therefore, a demonstration of compliance with NAAQS was not required.	Air impact analyses demonstrating compliance with NAAQS are required for pollutants having an emissions increase that is greater than BRC thresholds. Compliance with NAAQS has not been demonstrated for emissions that exceed the emission estimates presented in the emissions inventory of the application.
TAPS Modeling. Emission rates of TAPS per Idaho Air Rules Sections 585 and 586 for nickel exceeded Emissions Screening Level (EL) rates.	Air impact analyses demonstrating compliance with TAPS, as required by Idaho Air Rules Section 203.03, is required for pollutants having an emissions rate greater than ELs. Therefore, a demonstration of compliance with TAPs AAC and AACC was required.

2.0 Background Information

This section provides background information applicable to the project and the site where the facility is located. It also provides a brief description of the applicable air impact analyses requirements for the project.

2.1 Project Description

YMC is an existing facility that conducts metal fabrication for commercial and residential clients. YMC is submitting this application to resolve permit requirement compliance issues, and the associated air impact analyses were submitted to demonstrate that facility-wide emissions do not cause or contribute to an exceedance of any NAAQS or TAPS increment. The facility has been operating since 1988 and did not obtain a permit to construct from DEQ. A detailed description of the facility is listed in Section 1 of the application.

2.2 Proposed Location and Area Classification

YMC is located in Meridian, Idaho, at 2975 E. Lanark Street. This area is designated as an attainment or unclassifiable area for sulfur dioxide (SO_2), nitrogen dioxide (NO_2), carbon monoxide (CO), lead (Pb), ozone (O_3), particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers (PM_{10}), and particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers ($PM_{2.5}$). The area is not classified as non-attainment for any criteria pollutants.

2.3 Air Impact Analyses Required for All Permits to Construct

Criteria Pollutant and TAP Impact Analyses for a PTC are addressed in Idaho Air Rules Sections 203.02 and 203.03:

> *No permit to construct shall be granted for a new or modified stationary source unless the applicant shows to the satisfaction of the Department all of the following:*
>
> ***02. NAAQS**. The stationary source or modification would not cause or significantly contribute to a violation of any ambient air quality standard.*
>
> ***03. Toxic Air Pollutants.** Using the methods provided in Section 210, the emissions of toxic air pollutants from the stationary source or modification would not injure or unreasonably affect human or animal life or vegetation as required by Section 161. Compliance with all applicable toxic air pollutant carcinogenic increments and toxic air pollutant non-carcinogenic increments will also demonstrate preconstruction compliance with Section 161 with regards to the pollutants listed in Sections 585 and 586.*

Atmospheric dispersion modeling, using computerized simulations, is used to demonstrate compliance with both NAAQS and TAPs. Idaho Air Rules Section 202.02 states:

> ***Estimates of Ambient Concentrations**. All estimates of ambient concentrations shall be based on the applicable air quality models, data bases, and other requirements specified in 40 CFR 51 Appendix W (Guideline on Air Quality Models).*

2.4 Significant Impact Level and Cumulative NAAQS Impact Analyses

The Significant Impact Level (SIL) analysis for a new facility or proposed modification to a facility involves modeling estimated criteria air pollutant emissions from the facility or modification to determine the potential impacts to ambient air. Air impact analyses are required by Idaho Air Rules to be conducted according to methods outlined in 40 CFR 51, Appendix W (Guideline on Air Quality Models). Appendix W requires that facilities be modeled using emissions and operations representative of design capacity or as limited by a federally enforceable permit condition.

A facility or modification is considered to have a significant impact on air quality if maximum modeled impacts to ambient air exceed the established SIL listed in Idaho Air Rules Section 006 (referred to as a significant contribution in Idaho Air Rules) or as incorporated by reference as per Idaho Air Rules Section 107.03.b. Table 2 lists the applicable SILs.

If modeled maximum pollutant impacts to ambient air from the emissions sources associated with a new facility or modification exceed the SILs, then a cumulative NAAQS impact analysis is necessary to demonstrate compliance with NAAQS and Idaho Air Rules Section 203.02.

DEQ has developed modeling applicability thresholds that effectively assure that project-related emissions increases below stated values will result in ambient air impacts below the applicable SILs. The threshold levels and dispersion modeling analyses supporting those levels are presented in the *State of Idaho Guideline for Performing Air Quality Impact Analyses*[1] (*Idaho Air Modeling Guideline*). Use of a modeling threshold represents the use of conservative modeling, performed in support of the threshold, as a project SIL analysis. Project-specific modeling applicability for this project is addressed in Section 3.1.1 of this memorandum.

A cumulative NAAQS impact analysis for attainment area pollutants involves assessing ambient impacts (typically the design values consistent with the form of the standard) from facility-wide emissions, and emissions from any nearby co-contributing sources, and then adding a DEQ-approved background concentration value to the modeled result that is appropriate for the criteria pollutant/averaging-period at the facility location and the area of significant impact. The resulting pollutant concentrations in ambient air are then compared to the NAAQS listed in Table 2. Table 2 also lists SILs and specifies the modeled design value that must be used for comparison to the NAAQS. NAAQS compliance is evaluated on a receptor-by-receptor basis for the modeling domain.

If the cumulative NAAQS impact analysis indicates a violation of the standard, the permit may not be issued if the proposed project has a significant contribution (exceeding the SIL) to the modeled violation. This evaluation is made specific to both time and space. If the SIL analysis indicates the facility/modification has an impact exceeding the SIL, the facility might not have a significant contribution to a violation if impacts are below the SIL at the specific receptor showing the violation during the time periods when a modeled violation occurred.

Table 2. APPLICABLE REGULATORY LIMITS				
Pollutant	**Averaging Period**	**Significant Impact Levels[a] ($\mu g/m^3$)[b]**	**Regulatory Limit[c] ($\mu g/m^3$)**	**Modeled Design Value Used[d]**
PM_{10}[e]	24-hour	5.0	150[f]	Maximum 6th highest[g]
$PM_{2.5}$[h]	24-hour	1.2	35[i]	Mean of maximum 8th highest[j]
	Annual	0.3	12[k]	Mean of maximum 1st highest[l]
Carbon monoxide (CO)	1-hour	2,000	40,000[m]	Maximum 2nd highest[n]
	8-hour	500	10,000[m]	Maximum 2nd highest[n]
Sulfur Dioxide (SO_2)	1-hour	3 ppb[o] (7.8 $\mu g/m^3$)	75 ppb[p] (196 $\mu g/m^3$)	Mean of maximum 4th highest[q]
	3-hour	25	1,300[m]	Maximum 2nd highest[n]
	24-hour	5	365[m]	Maximum 2nd highest[n]
	Annual	1.0	80[r]	Maximum 1st highest[n]
Nitrogen Dioxide (NO_2)	1-hour	4 ppb (7.5 $\mu g/m^3$)	100 ppb[s] (188 $\mu g/m^3$)	Mean of maximum 8th highest[t]
	Annual	1.0	100[r]	Maximum 1st highest[n]
Lead (Pb)	3-month[u]	NA	0.15[r]	Maximum 1st highest[n]
	Quarterly	NA	1.5[r]	Maximum 1st highest[n]
Ozone (O_3)	8-hour	40 TPY VOC[v]	75 ppb[w]	Not typically modeled

[a] Idaho Air Rules Section 006 (definition for significant contribution) or as incorporated by reference as per Idaho Air Rules Section 107.03.b.
[b] Micrograms per cubic meter.
[c] Incorporated into Idaho Air Rules by reference, as per Idaho Air Rules Section 107.
[d] The maximum 1st highest modeled value is always used for the significant impact analysis unless indicated otherwise. Modeled design values are calculated for each ambient air receptor.
[e] Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers.
[f] Not to be exceeded more than once per year on average over 3 years.
[g] Concentration at any modeled receptor when using five years of meteorological data.
[h] Particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers.
[i] 3-year mean of the upper 98th percentile of the annual distribution of 24-hour concentrations.
[j] 5-year mean of the 8th highest modeled 24-hour concentrations at the modeled receptor for each year of meteorological data modeled. For the SIL analysis, the 5-year mean of the 1st highest modeled 24-hour impacts at the modeled receptor for each year.
[k] 3-year mean of annual concentration.
[l] 5-year mean of annual averages at the modeled receptor.
[m] Not to be exceeded more than once per year.
[n] Concentration at any modeled receptor.
[o] Interim SIL established by EPA policy memorandum.
[p] 3-year mean of the upper 99th percentile of the annual distribution of maximum daily 1-hour concentrations.
[q] 5-year mean of the 4th highest daily 1-hour maximum modeled concentrations for each year of meteorological data modeled. For the significant impact analysis, the 5-year mean of 1st highest modeled 1-hour impacts for each year is used.
[r] Not to be exceeded in any calendar year.
[s] 3-year mean of the upper 98th percentile of the annual distribution of maximum daily 1-hour concentrations.
[t] 5-year mean of the 8th highest daily 1-hour maximum modeled concentrations for each year of meteorological data modeled. For the significant impact analysis, the 5-year mean of maximum modeled 1-hour impacts for each year is used.
[u] 3-month rolling average.
[v] An annual emissions rate of 40 ton/year of VOCs is considered significant for O_3.
[w] Annual 4th highest daily maximum 8-hour concentration averaged over three years. The O_3 standard was revised (the notice was signed by the EPA Administrator on October 1, 2015) to 70 ppb. However, this standard will not be applicable for permitting purposes until it is incorporated by reference *sine die* into Idaho Air Rules.

Compliance with Idaho Air Rules Section 203.02 is generally demonstrated if: a) all modeled impacts of the SIL analysis are below the applicable SIL or other level determined to be inconsequential to NAAQS compliance; or b) modeled design values of the cumulative NAAQS impact analysis (modeling all emissions from the facility and co-contributing sources, and adding a background concentration) are less than applicable NAAQS at receptors where impacts from the proposed facility/modification exceeded the SIL or other identified level of consequence; or c) if the cumulative NAAQS analysis showed NAAQS violations, the impact of proposed facility/modification to any modeled violation was inconsequential (typically assumed to be less than the established SIL) for that specific receptor and for the specific modeled

time when the violation occurred.

2.5 Toxic Air Pollutant Analyses

Emissions of toxic substances are generally addressed by Idaho Air Rules Section 161:

> *Any contaminant which is by its nature toxic to human or animal life or vegetation shall not be emitted in such quantities or concentrations as to alone, or in combination with other contaminants, injure or unreasonably affect human or animal life or vegetation.*

Permitting requirements for toxic air pollutants (TAPs) from new or modified sources are specifically addressed by Idaho Air Rules Section 203.03 and require the applicant to demonstrate to the satisfaction of DEQ the following:

> *Using the methods provided in Section 210, the emissions of toxic air pollutants from the stationary source or modification would not injure or unreasonably affect human or animal life or vegetation as required by Section 161. Compliance with all applicable toxic air pollutant carcinogenic increments and toxic air pollutant non-carcinogenic increments will also demonstrate preconstruction compliance with Section 161 with regards to the pollutants listed in Sections 585 and 586.*

Per Idaho Air Rules Section 210, if the total project-wide emissions increase of any TAP associated with a new source or modification exceeds screening emission levels (ELs) of Idaho Air Rules Section 585 or 586, then the ambient impact of the emissions increase must be estimated. If ambient impacts are less than applicable Acceptable Ambient Concentrations (AACs) for non-carcinogens of Idaho Air Rules Section 585 and Acceptable Ambient Concentrations for Carcinogens (AACCs) of Idaho Air Rules Section 586, then compliance with TAP requirements has been demonstrated.

Idaho Air Rules Section 210.20 states that if TAP emissions from a specific source are regulated by the Department or EPA under 40 CFR 60, 61, or 63, then a TAP impact analysis under Section 210 is not required for that TAP.

3.0 Analytical Methods and Data

This section describes the methods and data used in analyses to demonstrate compliance with applicable air quality impact requirements.

3.1 Emission Source Data

Emissions rates of criteria pollutants and TAPs for the project were provided by the applicant for various applicable averaging periods. Review and approval of estimated emissions was the responsibility of the DEQ permit writer, and is not addressed in this modeling memorandum. DEQ modeling review included verification that the application's potential emissions rates were properly used in the model. The rates listed must represent the maximum allowable rate as averaged over the specified period.

Emissions rates used in the dispersion modeling analyses submitted by STANTEC should be reviewed by the DEQ permit writer against those in the emissions inventory of the permit application. All modeled criteria air pollutant and TAP emissions rates should be equal to or greater than the facility's emissions calculated in other sections of the PTC application or requested permit allowable emission rates.

3.1.1 Criteria Pollutant Emissions Rates and Modeling Applicability

If facility-wide potential to emit (PTE) values for a specific criteria pollutants would qualify for a below regulatory concern (BRC) permit exemption as per Idaho Air Rules Section 221 if it were not for some pollutants exceeding BRC thresholds, then an air impact analysis for that pollutant may not be required for permit issuance. DEQ's regulatory interpretation policy of exemption provisions of Idaho Air Rules (Policy on NAAQS Compliance Demonstration Requirements, DEQ policy memorandum, July 11, 2014) is that: "A DEQ NAAQS compliance assertion will not be made by the DEQ modeling group for specific criteria pollutants having a project emissions increase below BRC levels, provided the proposed project would have qualified for a Category I Exemption for BRC emissions quantities except for the emissions of another criteria pollutant." The interpretation policy also states that the exemption criteria of uncontrolled PTE not to exceed 100 ton/year (Idaho Air Rules Section 220.01.a.i) is not applicable when evaluating whether a NAAQS impact analyses is required. A permit will be issued limiting PTE below 100 ton/year, thereby negating the need to maintain calculated uncontrolled PTE under 100 ton/year.

An impact analysis must be performed for pollutant increases that would not qualify, on a pollutant-by-pollutant basis, for the BRC exemption from an impact analysis. STANTEC compared project emissions with BRC emissions levels for all criteria pollutants. Utilizing annual operating factors as contained in the permit, the emissions for all criteria pollutants are below BRC, and no modeling was therefore required.

DEQ has generated non-site-specific project modeling thresholds for those projects that cannot use the BRC exemption from the requirement to assure NAAQS compliance (if there are specific permitted emissions limits that require changing, etc.). Modeling applicability thresholds are provided in the *Idaho Air Modeling Guideline*. These thresholds were based on assuring an ambient impact of less than established SIL for that specific pollutant and averaging period.

If project-specific total emissions rates are below Level I Modeling Thresholds, project-specific air impact analyses are not necessary for permitting. Use of level II modeling thresholds are conditional, requiring DEQ approval. Table 3 provides the emissions-based modeling applicability summary. STANTEC compared emission estimates with BRC thresholds triggering the requirement of a NAAQS compliance demonstration, and determined that NAAQS compliance demonstrations are not required for any criteria pollutants. These annual emission estimates have been factored by annual operating levels as requested by the applicant.

Table 3. MODELING APPLICABILITY ANALYSIS RESULTS						
Pollutant	**Averaging Period**	**Emissions**	**BRC Threshold (ton/year)**	**Level I Modeling Thresholds (lb/hour or ton/year)**	**Level II Modeling Thresholds (lb/hour or ton/year)**	**Modeling Required**
$PM_{2.5}$	Annual	0.195 ton/yr	1	0.350	4.1	No
	24-hour	0.0445 lb/hr		0.054	0.63	No
PM_{10}	Annual	0.195 ton/yr	1.5	NA	NA	No
	24-hour	0.0445 lb/hr		0.22	2.6	No
NOx	Annual	0.725 ton/yr	4	1.2	14	No
	1-hour	0.166 lb/hr		0.2	2.4	No
SO_2	Annual	0.004 ton/yr	4	1.2	14	No
	1-hour	0.001 lb/hr		0.21	2.5	No
CO	Annual	0.61 ton/yr	10	15	175	No

Ozone (O_3) differs from other criteria pollutants in that it is not typically emitted directly into the atmosphere. O_3 is formed in the atmosphere through reactions of VOCs, NOx, and sunlight. Atmospheric dispersion models used in stationary source air permitting analyses (see Section 3.3.3) cannot be used to estimate O_3 impacts resulting from VOC and NOx emissions from an industrial facility. O_3 concentrations resulting from area-wide emissions are predicted by using more complex airshed models such as the Community Multi-Scale Air Quality (CMAQ) modeling system. Use of the CMAQ model is very resource intensive and DEQ asserts that performing a CMAQ analysis for a particular permit application is not typically a reasonable or necessary requirement for air quality permitting.

Addressing secondary formation of O_3 has been somewhat addressed in EPA regulation and policy. As stated in a letter from Gina McCarthy of EPA to Robert Ukeiley, acting on behalf of the Sierra Club (letter from Gina McCarthy, Assistant Administrator, United States Environmental Protection Agency, to Robert Ukeiley, January 4, 2012):

> *. . . footnote 1 to sections 51.166(I)(5)(I) of the EPA's regulations says the following: "No de minimis air quality level is provided for ozone. However, any net emission increase of 100 tons per year or more of volatile organic compounds or nitrogen oxides subject to PSD would be required to perform an ambient impact analysis, including the gathering of air quality data."*
>
> *The EPA believes it unlikely a source emitting below these levels would contribute to such a violation of the 8-hour ozone NAAQS, but consultation with an EPA Regional Office should still be conducted in accordance with section 5.2.1.c. of Appendix W when reviewing an application for sources with emissions of these ozone precursors below 100 TPY."*

Allowable emissions estimates of VOCs and NOx are below the 100 tons/year threshold, and DEQ determined it was not appropriate or necessary to require a quantitative source specific O_3 impact analysis.

Secondary Particulate Formation

The impact from secondary particulate formation resulting from emissions of NOx, SO_2, and/or VOCs was assumed by DEQ to be negligible on the basis of the magnitude of emissions and the short distance from emissions sources to modeled receptors where maximum PM_{10} and $PM_{2\ 5}$ impacts would be anticipated.

3.1.2 Toxic Air Pollutant Emissions Rates

TAP emissions regulations under Idaho Air Rules Section 220 are only applicable for new or modified sources constructed after July 1, 1995. The submitted emissions inventory in the application identified one TAP, nickel, that potential increases of the Idaho Air Rules Section 586 could exceed screening emissions levels (ELs). Potential increases in emissions of other TAPs were all less than applicable ELs. Table 4 lists emission increases for this TAP and compares it to the EL.

Table 4. MODELED TAP EMISSIONS RATES

Pollutant	CAS No.	Total Emissions Increase (lb/hr)	EL (lb/hr)[a]
Nickel	7440-02-0	3.3E-05	2.70E-05

[a] pounds/hour

Table 5 provides source-specific TAP emission rates used in the air impact analyses.

Table 5. TAPS Emissions as Modeled by Source		
Source ID	**Source Description**	**NICKEL (lb/hr)[a]**
LASER	Laser Cutting Machine	1.16E-06
PLASMA	Plasma Cutting Machine	6.04E-07
UH1	Heater 1	1.54E-07
UH2	Heater 2	2.06E-07
UH3	Heater 3	2.96E-07
UH4	Heater 4	2.06E-07
UH5	Heater 5	2.06E-07
UH6	Heater 6	1.54E-07
UH7	Heater 7	3.09E-07
UH8	Heater 8	3.09E-07
UH9	Heater 9	3.09E-07
UH10	Heater 10	3.09E-07
RTU1	RTU Package Unit 1	2.06E-07
RTU2	RTU Package Unit 2	9.35E-08
RTU3	RTU Package Unit 3	9.35E-08
RTU4	RTU Package Unit 4	9.35E-08
RTU5	RTU Package Unit 5	1.25E-07
WELDING	Welding Emissions	1.23E-06
ABRASIVE	Abrasive Cutting	2.42E-05
UH11	Other three heaters	1.36E-07
UH12	Other three heaters	1.36E-07
UH13	Other three heaters	1.36E-07

[a] pounds/hour

3.1.3 Emission Release Parameters

Table 6 provides emissions release parameters, including stack height, stack diameter, exhaust temperature, and exhaust velocity for facility sources as used in the final modeling assessment.

Stack parameters used in the modeling analyses were largely documented/justified adequately in the application. Many of the sources had characteristics taken from field tests, as well as design documents. Sources with capped or horizontal flows were assigned an exit velocity of 0.001 meters/second.

Table 6. Modeling Parameters							
Point Sources							
Source ID	**Source Description**	**Easting [a] (X) (m)**	**Northing [b] (Y) (m)**	**Stack Height (ft)[c]**	**Temp. (°F)[d]**	**Exit Velocity (fps)[e]**	**Stack Diameter (ft) [c]**
LASER	Laser Cutting Machine	551873	4828381	26	85	17.275	1.44
PLASMA	Plasma Cutting Machine	551879	4828381	26	85	17.275	1.44
UH1	Heater 1	551865	4828392	23	460	0.003	0.33
UH2	Heater 2	551864	4828380	23	460	0.003	0.33
UH3	Heater 3	551868	4828378	23	460	0.003	0.33
UH4	Heater 4	551870	4828376	23	460	0.003	0.33
UH5	Heater 5	551879	4828390	23	460	0.003	0.33
UH6	Heater 6	551887	4828397	23	460	0.003	0.33
UH7	Heater 7	551899	4828414	30	460	0.003	0.33
UH8	Heater 8	551908	4828414	30	460	0.003	0.33
UH9	Heater 9	551898	4828383	30	460	0.003	0.33
UH10	Heater 10	551898	4828371	30	460	0.003	0.33
RTU1	RTU Package Unit 1	551877	4828410	29	460	0.003	0.25
RTU2	RTU Package Unit 2	551886	4828400	26	460	0.003	0.25
RTU3	RTU Package Unit 3	551894	4828400	26	460	0.003	0.25
RTU4	RTU Package Unit 4	551897	4828402	26	460	0.003	0.25
RTU5	RTU Package Unit 5	551874	4828418	22	460	0.003	0.25

Volume Sources						
Source ID	**Source Description**	**Easting [a] (X) (m)**	**Northing[b] (Y) (m)**	**Release Height (ft)[c]**	**Init. Horiz. Dimension[f] (ft) [c]**	**Init. Vert. Dimension[f] (ft) [c]**
WELDING	Welding Emissions	551910	4828410	8	3.71	7.448
ABRASIVE	Abrasive Cutting	551879	4828370	8	3.71	7.448
UH11	Other three heaters	551861	4828400	8	3.71	7.448
UH12	Other three heaters	551910	4828410	8	3.71	7.448
UH13	Other three heaters	551879	4828370	8	3.71	7.448

[a] Universal Transverse Mercator coordinates in the east/west direction.
[b] Universal Transverse Mercator coordinates in the north/south direction.
[c] Feet.
[d] Degrees Fahrenheit.
[e] Feet per second.
[f] Initial horizontal/vertical dimension of plume.

3.2 Background Concentrations

No modeling was necessary to demonstrate compliance with the NAAQS for any of the criteria pollutants. Therefore, no ambient background concentrations were utilized in the modeling analyses.

3.3 Impact Modeling Methodology

This section describes the modeling methods used by the applicant to demonstrate preconstruction compliance with applicable air quality standards.

3.3.1 General Overview of Analyses

STANTEC performed project-specific air impact analyses that were determined by DEQ to be reasonably representative of the proposed facility as described in the application. Results of the submitted analyses demonstrate compliance with applicable air quality standards to DEQ's satisfaction, provided the facility is operated as described in the submitted application and in this memorandum.

Table 7 provides a brief description of parameters used in the modeling analyses.

Table 7. MODELING PARAMETERS

Parameter	Description/Values	Documentation/Addition Description
General Facility Location	Meridian, Idaho	The facility is located in an area that is attainment or unclassified for all criteria air pollutants
Model	AERMOD	AERMOD with the PRIME downwash algorithm, version 15181.
Meteorological Data	2008-2012 Boise Idaho NWS, and upper air data from Boise, ID	The meteorological model input files for this project were provided by and recommended as most representative for this project by IDEQ, as described in the IDEQ modeling protocol and verified by IDEQ's approval of that protocol.
Terrain	Considered	See section 3.3.5 below
Building Downwash	Considered	Because there are significant buildings in the vicinity of YMC, BPIP-PRIME was used to evaluate building dimensions for consideration of downwash effects in AERMOD.
Receptor Grid	Grid 1	10-meter spacing along the ambient air boundary and out to distances of 200 meters northing and 300 meters easting with respect to the facility
	Grid 2	25-meter spacing out to distances of 300 meters northing and 450 meters easting with respect to the facility
	Grid 3	50-meter spacing out to approximately 600 m
	Grid 4	100-meter spacing for distances out to 1300 meters from facility
	Grid 5	250-meter spacing for distances out to 2500 meters from the facility
	Grid 6	500-meter spacing for distances out to 6,000 meters from the facility
	Grid 7	1000-meter spacing for distances out to 11,000 meters from the facility

3.3.2 Modeling protocol and Methodology

As mentioned previously, a modeling protocol was not submitted for this project. The initial application was submitted on July 7, 2016. DEQ responded with a letter of incompleteness on August 5, 2016. This was largely due to missing forms and permitting issues. The only modeling-related comment from DEQ was a request for a clarification on the ambient boundary of the facility. YMC responded with a satisfactory explanation of the ambient boundary on August 12, and DEQ then determined the application complete on August 17, 2016.

STANTEC proposed using hourly limitations on several of the sources, and these restrictions were utilized in the modeling. Project-specific modeling and other required impact analyses were generally conducted using data and methods discussed in pre-application correspondence and in the *Idaho Air Quality Modeling Guideline*[1].

3.3.3 Model Selection

Idaho Air Rules Section 202.02 requires that estimates of ambient concentrations be based on air quality models specified in 40 CFR 51, Appendix W (Guideline on Air Quality Models). The refined, steady state, multiple source Gaussian dispersion model AERMOD was promulgated as the replacement model for ISCST3 in December 2005. AERMOD retains the single straight line trajectory of ISCST3, but includes more advanced algorithms to assess turbulent mixing processes in the planetary boundary layer for both convective and stable stratified layers.

AERMOD version 15181 was used by the applicant for the modeling analyses to evaluate impacts of the facility. This version is the current version at the time the application was received by DEQ.

3.3.4 Meteorological Data

STANTEC used meteorological data collected at the Boise airport for the period 2008-2012. Upper air data was also taken from the Boise, Idaho airport. While this data is acceptable, there is a newer dataset from the period 2011-2015 processed from the Boise airport, and this dataset is required to be used in any future analyses. The data as used is deemed representative for modeling in the locale of YMC.

3.3.5 Effects of Terrain on Modeled Impacts

Terrain data were extracted from United States Geological Survey (USGS) National Elevation Dataset (NED) files in the WGS84 datum (approximately equal to the NAD83 datum). STANTEC used 1/3 Arc Second resolution data, which is adequate for this analysis.

The terrain preprocessor AERMAP Version 11103 was used to extract the elevations from the NED files and assign them to receptors in the modeling domain in a format usable by AERMOD. AERMAP also determined the hill-height scale for each receptor. The hill-height scale is an elevation value based on the surrounding terrain which has the greatest effect on that individual receptor. AERMOD uses those heights to evaluate whether the emissions plume has sufficient energy to travel up and over the terrain or if the plume will travel around the terrain.

DEQ reviewed the area surrounding the facility by using the web-based mapping program Google Earth, which uses the WGS84 datum. DEQ also overlaid modeling files with a digital photograph background images acquired from the 2013 ARCGIS NAIP (National Agriculture Imagery Program) data base. The immediate area is effectively flat with regard to dispersion modeling affects. Elevations in the modeling domain matched those indicated by the background images

3.3.6 Facility Layout

DEQ compared site locations to those in aerial photographs on Google Earth. The modeled location matched well with aerial photographs in Google Earth as well as from those in the ARCGIS 2013 NAIP database.

3.3.7 Effects of Building Downwash on Modeled Impacts

Potential downwash effects on emissions plumes are usually accounted for in the model by using building dimensions and locations (locations of building corners, base elevation, and building heights). Dimensions and orientation of proposed buildings were needed as input to the Building Profile Input Program for the Plume Rise Model Enhancements downwash algorithm (BPIP-PRIME) because there are existing structures affecting the facility sources.

3.3.8 Ambient Air Boundary

Ambient air is defined in Section 006 of the Idaho Air Rules as "that portion of the atmosphere, external to buildings, to which the general public has access." Public access to the YMC facility is precluded by a fence in all directions and gated preventing public access.

3.3.9 Receptor Network

Table 7 describes the receptor grid used in the submitted analyses. The receptor grid met the minimum recommendations specified in the *Idaho Air Quality Modeling Guideline*[1]. DEQ determined this grid assured maximum impacts were reasonably resolved by the model considering: 1) types of sources modeled; 2) modeled impacts and the modeled concentration gradient; 3) conservatism of the methods and data used as inputs to the analyses; 4) potential for continual exposures or exposure to sensitive receptors. Additionally, DEQ performed sensitivity analyses using a finer grid spaced receptor network to assure that maximum concentrations were below all applicable standards.

3.3.10 Good Engineering Practice Stack Height

An allowable good engineering practice (GEP) stack height may be established using the following equation in accordance with Idaho Air Rules Section 512.03.b:

$H = S + 1.5L$, where:

H = good engineering practice stack height measured from the ground-level elevation at the base of the stack.

S = height of the nearby structure(s) measured from the ground-level elevation at the base of the stack.

L = lesser dimension, height or projected width, of the nearby structure.

Buildings exist in the vicinity for all point sources modeled. Therefore, consideration of downwash caused by nearby buildings was required.

4.0 Impact Modeling Results

4.1 Results for NAAQS Significant Impact Level Analyses

STANTEC did not perform air quality modeling for any criteria pollutants because all emissions were below BRC thresholds.

4.2 Results for TAPs Impact Analyses

Dispersion modeling is required to demonstrate compliance with TAP increments specified by Idaho Air Rules Section 585 and 586 for those TAPs with project-specific emission increases exceeding emissions screening levels (ELs). Because there is one TAP emission that exceeds the ELs, modeling analyses were needed to demonstrate compliance with all AAC and AAAC. Results are listed in Table 8, and show compliance with all AAC and AAAC.

Table 8. TAP MODELING RESULTS					
Pollutant	**CAS No.**	**Average**	**Modeled Conc. ($\mu g/m^3$)[a]**	**AAC/AAAC[b] ($\mu g/m^3$)**	**%AAC/AAAC**
Nickel	7440-02-0	Annual	4.04E-04[c]	4.2E-03	96%

[a] micrograms per cubic meter.
[b] Acceptable Ambient Concentration or Acceptable Ambient Concentration of a Carcinogen.
[c] maximum average concentration for five-year period 2008-2012.

5.0 Conclusions

The ambient air impact analyses and other air quality analyses submitted with the PTC application demonstrated to DEQ's satisfaction that emissions from the YMC project will not cause or significantly contribute to a violation of any ambient air quality standard.

References:

1. *State of Idaho Guideline for Performing Air Quality Impact Analyses.* Idaho Department of Environmental Quality. September 2013. State of Idaho DEQ Air Doc. ID AQ-011. Available at http://www.deq.idaho.gov/media/1029/modeling-guideline.pdf