Statement of Basis

Permit to Construct No. P-2007.0228
Project ID 62144

Foam Molders Inc
Post Falls, Idaho

Facility ID 055-00047

Final

February 7, 2019
Tom Burnham, P.E. TB
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

acfm	actual cubic feet per minute
AFS	AIRS Facility Subsystem
AIRS	Aerometric Information Retrieval System
Btu	British thermal units
CAA	Clean Air Act
CO	carbon monoxide
DEQ	Department of Environmental Quality
dscf	dry standard cubic feet
EL	screening emission levels
EPA	U.S. Environmental Protection Agency
EPS	expandable polystyrene
ft	foot (feet)
HAP	hazardous air pollutants
IDAPA	a numbering designation for all administrative rules in Idaho promulgated in accordance with the Idaho Administrative Procedures Act
lbs	pounds
lb/hr	pounds per hour
MACT	Maximum Achievable Control Technology
MMBtu	million British thermal units
NESHAP	National Emission Standards for Hazardous Air Pollutants
NO_2	nitrogen dioxide
NO_X	nitrogen oxides
NSPS	New Source Performance Standards
PC	Permit condition
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
PSD	Prevention of Significant Deterioration
PTC	permit to construct
PTE	potential to emit
Rules	*Rules for the Control of Air Pollution in Idaho*
scf	standard cubic feet
SCL	significant contribution limits
SO_2	sulfur dioxide
SO_x	sulfur oxides
T/yr	tons per consecutive 12 calendar month period
T/mo	tons per month
T2	Tier II operating permit
TAP	toxic air pollutants
VOC	volatile organic compounds

FACILITY INFORMATION

Description

The Expandable Polystyrene (EPS) raw materials, or beads, come into the facility in 1,000-pound lined Gaylord boxes. The beads contain an encapsulated blowing agent, pentane, which is usually 3.5 to 6.5% of the material by weight. The emission rates at each phase of the operation vary according to such factors as the density of the expanded beads, the shape and size of the molded parts, and finished goods storage requirements. The beads are typically vacuum-fed from the Gaylord boxes to the pre-expanders where the beads are partially expanded to their desired density (referred to as pre-puff).

Approximately 25% of the encapsulated pentane is released in the expansion process. The expanded beads are then aged from 2 to 48 hours to allow the pre-puff to stabilize by diffusing air into the expanded beads. Approximately 20% of the initial pentane is released during this aging process. These materials are then transferred directly to the molds where, with use of steam, they are fused together into the desired shapes created by the mold forms. Approximately 15-25% of the initial pentane is released during the molding process. In the post-molding phase, approximately 15% of the initial pentane is released in the first 24 hours, and approximately 10% in the next 24 hours. The remaining 15% pentane diffuses out of the product over a long period of time.

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).

February 29, 2008	P-060109, issued June 9, 2006, without modifications. DEQ determined that the Tier II portion of the permit was no longer required because all of the permit conditions are PTC requirements, and there are no remaining Tier II operating permit conditions. The regional office requested that a requirement be added limiting the boiler to burning natural gas only. (A, but will be S upon issuance of this permit)
June 9, 2006	Tier 2/PTC No. 055-00047 issued for the installation of a pre-expander and block mold which increased the expandable polystyrene (EPS) throughput limit and the VOC emission rate limit. (S)
December 10, 2002	Tier 2/PTC No. P-060109 issued to remove specific equipment descriptions so as to maintain operational flexibility by allowing for the installation, replacement, and/or removal of the process equipment, while limiting total daily and total annual facility-wide VOC emissions from the facility. (S)
September 26, 2000	Tier II Operating Permit No. 055-00047 issued to permit whole facility and limit emissions below major source levels. (S)

Application Scope

This PTC is for a minor modification at an existing minor facility. The applicant has proposed to increase in VOC emissions to 200 tons per year Title V major facility. There has also been a 3.4MMBtu/hr boiler recently added which will be encompassed in the scope. There is also another 6.3 MMBtu/hr boiler that was installed around 2009, operating since then, that was not included in the scope as it has been operating for approximately 10 years and is not relevant to the current emission changes requested.

Application Chronology

March 22, 2018	Foam Molders Inc and DEQ had a pre-application meeting about discussing a PTC to increase throughput to major source levels for VOC.
March 26, 2018	Foam Molders Inc disclosed that due to growth, the facility was in violation of current VOC limits.

June 13, 2018	Foam Molders Inc and DEQ entered into a Voluntary Consent Order which included notification that a PTC modification was required (Enforcement Case No. E-2018.0004).
November 19, 2018	DEQ received an application and an application fee.
November 26 – December 11, 2018	DEQ provided an opportunity to request a public comment period on the application and proposed permitting action.
December 4, 2018	DEQ determined that the application was complete.
December 7, 2018	DEQ made available the draft permit and statement of basis for peer and regional office review.
January 18, 2019	DEQ made available the draft permit and statement of basis for applicant review.
February 4, 2019	DEQ received the permit processing fee.
February 7, 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.
1	Emissions Unit Name: Boiler A Manufacturer: Hurst Model: 300 ID Manufacture Date: 1996 Heat input rating: 6.3 MMBtu/hr Fuel: Natural Gas	None	Boiler A Exhaust
2	Emissions Unit Name: Boiler B Manufacturer: Hurst Model: 300 Manufacture Date: 2009 Heat input rating: 6.3 MMBtu/hr Fuel: Natural Gas	None	Boiler B Exhaust
3	Emissions Unit Name: Boiler C Manufacturer: Hurst Model: 400 ID No. 14053 Manufacture Date: 2007 Heat input rating: 3.4 MMBtu/hr Fuel: Natural Gas	None	Boiler C Exhaust
4	Process Equipment	None	Various vents, widows, and doors

Emissions Inventories

Potential to Emit

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

Using this definition of Potential to Emit an emission inventory was developed for the EPS expansion process operations at the facility (see Appendix A) associated with this proposed project. Emissions estimates of criteria pollutant, HAP PTE were based on emission factors from AP-42, operation of 8760 hours per year, and process information specific to the facility for this proposed project.

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 as submitted by the Applicant and verified by DEQ staff. See Appendix A for a detailed presentation of the calculations and the assumptions used to determine emissions for each emissions unit. For this EPS expansion process operation uncontrolled Potential to Emit is based upon a worst-case for operation of the facility of 8,760 hr/yr.

Table 2 UNCONTROLLED POTENTIAL TO EMIT FOR REGULATED AIR POLLUTANTS

Source	$PM_{10}/PM_{2.5}$	SO_2	NO_X	CO	VOC
	T/yr	T/yr	T/yr	T/yr	T/yr
Boiler A – 6.3 MMBtu/hr	0.20	0.02	2.63	2.21	0.14
Boiler B - 6.3 MMBtu/hr	0.20	0.02	2.63	2.21	0.14
Boiler C -3.4 MMBtu/hr	0.11	0.01	1.46	1.23	0.08
Process Equipment	0.00	0.00	0.00	0.00	200.0
Total	**0.51**	**0.05**	**6.72**	**5.65**	**200.36**

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.

The following table presents the pre-project potential to emit for all criteria pollutants from all emissions units at the facility as submitted by the Applicant and verified by DEQ staff. See Appendix A for a detailed presentation of the calculations of these emissions for each emissions unit.

Table 3 PRE-PROJECT POTENTIAL TO EMIT FOR REGULATED AIR POLLUTANTS

Source	$PM_{10}/PM_{2.5}$		SO_2		NO_X		CO		VOC	
	lb/hr[a]	T/yr[b]	lb/hr[a]	T/yr[b]	lb/hr[a]	T/yr[b]	lb/hr[a]	T/yr[b]	lb/hr[a]	T/yr[b]
Boiler A	0.05	0.20	0.004	0.02	0.60	2.63	0.50	2.21	0.03	0.14
Boiler B	0.05	0.20	0.004	0.02	0.60	2.63	0.50	2.21	0.03	0.14
Process Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	119.0	95.2
Pre-Project Totals	**0.10**	**0.40**	**0.01**	**0.04**	**1.20**	**5.26**	**1.00**	**4.42**	**119.06**	**95.48**

a) Controlled average emission rate in pounds per hour is a daily average, based on the proposed daily operating schedule and daily limits.
b) Controlled average emission rate in tons per year is an annual average, based on the proposed annual operating schedule and annual limits.

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.

The following table presents the post project Potential to Emit for criteria 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 4 POST PROJECT POTENTIAL TO EMIT FOR REGULATED AIR POLLUTANTS

Source	$PM_{10}/PM_{2.5}$		SO_2		NO_X		CO		VOC	
	lb/hr[a]	T/yr[b]	lb/hr[a]	T/yr[b]	lb/hr[a]	T/yr[b]	lb/hr[a]	T/yr[b]	lb/hr[a]	T/yr[b]
Boiler A	0.05	0.20	0.004	0.02	0.60	2.63	0.50	2.21	0.03	0.14
Boiler B	0.05	0.20	0.004	0.02	0.60	2.63	0.50	2.21	0.03	0.14
Boiler C	0.025	0.11	0.002	0.01	0.33	1.46	0.28	1.23	0.02	0.08
Process Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	119.0	200.00
Post Project Totals	**0.13**	**0.51**	**0.01**	**0.05**	**1.53**	**6.72**	**1.28**	**5.65**	**119.08**	**200.36**

a) Controlled average emission rate in pounds per hour is a daily average, based on the proposed daily operating schedule and daily limits.
b) Controlled average emission rate in tons per year is an annual average, based on the proposed annual operating schedule and annual limits.

Change in Potential to Emit

The change in facility-wide potential to emit is used to determine if a public comment period may be required and to determine the processing fee per IDAPA 58.01.01.225. The following table presents the facility-wide change in the potential to emit for criteria pollutants.

Table 5 CHANGES IN POTENTIAL TO EMIT FOR REGULATED AIR POLLUTANTS

Source	$PM_{10}/PM_{2.5}$		SO_2		NO_X		CO		VOC	
	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr
Pre-Project Potential to Emit	0.10	0.40	0.01	0.04	1.20	5.26	1.00	4.42	119.06	95.48
Post Project Potential to Emit	0.13	0.51	0.01	0.05	1.53	6.72	1.28	5.65	119.08	200.36
Changes in Potential to Emit	**0.03**	**0.11**	**0.00**	**0.01**	**0.33**	**1.46**	**0.28**	**1.23**	**0.02**[a]	**104.88**

a) Permit condition 2.3 is not increasing and remaining at 2,856 lb/day VOC . That is the basis for exempting the project from modeling for ozone due to VOCs as precursor emissions.

TAP Emissions

Since Permit condition 2.3 is not increasing and remaining at 2,856 lb/day VOC, the main TAP of interest, pentane, is not considered to be changing.

Below is the TAPs analysis for the addition of the 3.4 MMBtu/hr boiler representing the increase in TAPs:

Table 6 CHANGE IN POTENTIAL TO EMIT FOR TOXIC AIR POLLUTANTS

Toxic Air Pollutants	Change in Emissions Rates for Units at the Facility (lb/hr)	Screening Emission Level (lb/hr)	Exceeds Screening Level? (Y/N)
2-Methylnaphthalene	8.00E-08	9.10E-05	No
3-Methylchloranthrene	6.00E-09	2.50E-06	No
Acenaphthene	6.00E-09	9.10E-05	No
Acenaphthylene	6.00E-09	9.10E-05	No
Anthracene	8.00E-09	9.10E-05	No
Benzo(a)anthracene	6.00E-09	9.10E-05	See POM
Benzo(a)pyrene	4.00E-09	2.00E-06	See POM
Benzo(b)fluoranthene	6.00E-09		See POM
Benzo(g,h,i)perylene	4.00E-09	9.10E-05	No
Benzo(k)fluoranthene	6.00E-09		See POM
Chrysene	6.00E-09		See POM
Dibenzo(a,h)anthracene	4.00E-09		See POM
Dichlorobenzene	4.00E-06	9.10E-05	No
Fluoranthene	1.00E-08	9.10E-05	No
Fluorene	9.33E-09	9.10E-05	No
Indeno(1,2,3-cd)pyrene	6.00E-09		See POM
Naphthalene	7.42E-04	3.33	No

Naphthalene	2.03E-06	9.10E-05	No
Phenanathrene	5.67E-08	9.10E-05	No
Pyrene	1.67E-08	9.10E-05	No
Polycyclic Organic Matter (POM) 7-PAH Group	3.80E-08	2.00E-06	No
Benzene	7.00E-06	8.00E-04	No
Formaldehyde	2.50E-04	5.10E-04	No
Hexane	2.50E-04	12	No
Toluene	4.72E-07	25	No
Pentane	3.61E-04	118	No
Arsenic	6.67E-07	1.50E-06	No
Barium	6.11E-07	0.033	No
Beryllium	4.00E-08	2.80E-05	No
Cadmium	3.67E-06	3.70E-06	No
Chromium	1.94E-07	0.033	No
Cobalt	1.17E-08	0.0033	No
Copper	1.18E-07	0.013	No
Manganese	5.28E-08	0.067	No
Mercury	3.61E-08	0.003	No
Molybdenum	1.53E-07	0.333	No
Nickel	7.00E-06	2.70E-05	No
Selenium	3.33E-09	0.013	No
Vanadium	3.19E-07	0.003	No
Zinc	4.03E-06	0.667	No

All changes in emissions rates for TAP were below EL (screening emissions level) as a result of this project. Therefore, modeling is not required for any TAP because none of the screening ELs identified in IDAPA 58.01.01.585/586 were exceeded.

Ambient Air Quality Impact Analyses

As presented in the Modeling Memo in Appendix B, the estimated emission rates of PM_{10}, $PM_{2.5}$, SO_2, NO_X, CO, VOC, HAP, and TAP from this project were below applicable screening emission levels (EL) and published DEQ modeling thresholds established in IDAPA 58.01.01.585-586 and in the State of Idaho Air Quality Modeling Guideline[1]. Refer to the Emissions Inventories section for additional information concerning the emission inventories.

REGULATORY ANALYSIS

Attainment Designation (40 CFR 81.313)

The facility is located in Kootenai 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 HAPs (Hazardous Air Pollutants) Only:

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

HAPs) has permitted emissions > 25 T/yr.

SM80 = Use if a synthetic minor (uncontrolled HAPs emissions are > 10 T/yr or if the aggregate of all uncontrolled HAPs (Total HAPs) emissions are > 25 T/yr and permitted emissions fall below applicable major source thresholds) and the permit sets limits > 8 T/yr of a single HAP or ≥ 20 T/yr of Total HAPs.

SM = Use if a synthetic minor (uncontrolled HAPs emissions are > 10 T/yr or if the aggregate of all uncontrolled HAPs (Total HAPs) emissions are > 25 T/yr and permitted emissions fall below applicable major source thresholds) and the permit sets limits < 8 T/yr of a single HAP and/or < 20 T/yr of Total HAPs.

B = Use when the potential to emit (i.e. uncontrolled emissions and permitted emissions) are below the 10 and 25 T/yr HAP major source thresholds.

UNK = Class is unknown.

For All Other Pollutants:

A = Use when permitted emissions of a pollutant are > 100 T/yr.

SM80 = Use if a synthetic minor for the applicable pollutant (uncontrolled emissions are > 100 T/yr and permitted emissions fall below 100 T/yr) and permitted emissions of the pollutant are ≥ 80 T/yr.

SM = Use if a synthetic minor for the applicable pollutant (uncontrolled emissions are > 100 T/yr and permitted emissions fall below 100 T/yr) and permitted emissions of the pollutant are < 80 T/yr.

B = Use when the potential to emit (i.e. uncontrolled emissions and permitted emissions) are below the 100 T/yr major source threshold.

UNK = Class is unknown.

Table 7 REGULATED AIR POLLUTANT FACILITY CLASSIFICATION

Pollutant	Uncontrolled PTE (T/yr)	Permitted PTE (T/yr)	Major Source Thresholds (T/yr)	AIRS/AFS Classification
PM	0.51	0.51	**100**	B
PM_{10}	0.51	0.51	**100**	B
$PM_{2.5}$	0.51	0.51	**100**	B
SO_2	0.05	0.05	**100**	B
NO_X	6.72	6.72	**100**	B
CO	5.65	5.65	**100**	B
VOC	200	200	**100**	A
HAP (single)	<10	<10	**10**	B
Total HAPs	<25	<25	**25**	B

Permit to Construct (IDAPA 58.01.01.201)

IDAPA 58.01.01.201 ..... Permit to Construct Required

Due to requirements from a consent order, the applicant has requested that a PTC be issued to the facility for the existing EPS expansion process operation. In accordance with IDAPA 58.01.01.220.01.a.ii, the maximum capacity of a source to emit an air pollutant under its physical and operational design without considering limitations on emissions such as air pollution control equipment, restrictions on hours of operation and restrictions on the type and amount of material combusted, stored or processed shall be less than the significant emission rates set out in the definition of significant at Section 006. Uncontrolled emissions from this facility for EPS expansion process exceeded the significance threshold. Therefore, the facility cannot be exempted and a PTC is required to 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.

The permittee has requested that a PTC be issued to the facility for the modified emissions source. Therefore, a permit to construct is required to 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.

The permittee has requested that a PTC be issued to the facility for the modified emissions source. Therefore, a permit to construct is required to 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 is assured by Permit Condition 2.5.

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 have a potential to emit greater than 100 tons per year for VOC as demonstrated previously in the Emissions Inventories Section of this analysis. Therefore, this facility is classified as a major facility, as defined in IDAPA 58.01.01.008.10. Therefore, in accordance with IDAPA 58.01.01.313.01.b, the permittee must submit a complete application to DEQ for an initial Tier I operating permit within 12 months of becoming a Tier I source or commencing operation. This requirement is assured by Permit Condition 2.9.

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 proposed source is not an affected source subject to NESHAP in 40 CFR 61, and this permitting action does not alter the applicability status of existing affected sources at the facility.

MACT/GACT Applicability (40 CFR 63)

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

Permit Conditions Review

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

Permit Conditions 1.1 through 1.3

Section 1 was updated to show the scope and the permit being replaced

Permit Conditions 2.3

The annual VOC limit was changed from 95.2 T/yr to 200 T/yr.

Permit Conditions 2.4

The method of calculation of total VOC was updated to reflect a revised VOC emissions data assumes only a 77% loss of pentane from its process, and is based on a more recent study performed by the URS Corporation (URS) in 2009. Further details of this revision are found in the Consent Order for enforcement case No. E-2018.0004 (TRIM2018AAJ322).

Permit Condition 2.5

The standard language for opacity was included due to removal of visible emission requirements with the removal of the Tier 2 facility wide conditions.

Permit Condition 2.6

The method of calculation of daily throughput was updated to reflect the revised VOC emissions data assumes only a 77% loss of pentane from its process.

Permit Condition 2.7

The method of calculation of annual throughput was updated to reflect the revised VOC emissions data assumes only a 77% loss of pentane from its process.

Permit Condition 2.9

The 200 T/yr VOC limit results in the facility becoming a major source of VOC emission and requires the facility to apply for a Tier 1 permit. This permit condition requires the facility to do so within 12 months of becoming a Tier 1 source.

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 not a request for a public comment period on DEQ's proposed action. Refer to the chronology for public comment opportunity dates.

APPENDIX A – EMISSIONS INVENTORIES

Potential to Emit

Facility: FMI-EPS (Post Falls

Facility ID: 055-00047

Project: Modify Existing PTC to emit 200 TPY of VOC (Pentane) and modify current emissions rate

Uncontrolled Emissions – Pentane (lbs / 24 hours)

Uncontrolled Pentane emissions

Max Uncontrolled Pentane per day = $EPS_{max\ d}$ * R * $P\%_{max}$

= 213,000 lbs per day * 0.77 * .065

Max Potential to Emit (24 hours) = **10,660.65 lbs pentane per day**

Max Potential to Emit (hour) = 10,660.65 lbs pentane per day / 24 hours per day

Max Potential to Emit (hour) = **444.19 lbs pentane per hour**

Where

$EPS_{max\ d}$ = Maximum Uncontrolled EPS Throughput per day

= 8,900 lbs per hour * 24 hours per day

= 213,600 lbs per day

R = Emission Rate of Pentane

= 0.77 (Corporation, URS, 2009)

$P\%_{max}$ = Maximum Pentane Content by percentage of EPS

= 6.5% (Corporation, URS, 2009)

Controlled Pentane Emissions = EPS_{limit} * R * P%

$EPS_{limit\ lbs}$ = P / (R * P%)

= 2,856 / (0.77 * P%)

Where

P = Pentane Restrictions per 24 hours of 2,856 lbs

P% = Actual Pentane content by % of material processed

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FMI EPS LLC

Uncontrolled Emissions – VOC (tons per year)

Max Uncontrolled Pentane year	= $EPS_{max\ y}$ * R * $VOC\%_{max}$ / 2,000 lbs per ton
	= 77,964,000 lbs per day * 0.77 * .065 / 2,000 lbs per ton
Max Potential to Emit (year)	**= 1951 tons per year**
Where	
$EPS_{max\ y}$	= Maximum Uncontrolled EPS Throughput per year
	= 8,900 lbs per hour * 24 hours per day * 365 days per year
	= 77,964,000 lbs per year
R	= Emission Rate of Pentane
	= 0.77 (Corporation, URS, 2009)
$VOC\%_{max}$	= Maximum Pentane Content by percentage of EPS
	= 6.5% (Corporation, URS, 2009)

Controlled VOC Emissions	**= $EPS_{limit\ lbs}$ * R * VOC%**
$EPS_{limit\ lbs}$	**= VOC_{limit} / (R * VOC%)**
	= 200 voc tons per year * 2000 lbs per ton / (0.77 * VOC%)
Where	
VOC_{limit}	= 200 tons per year
VOC%	= Actual VOC content by % of material processed

Bibliography

Corporation, URS. (2009). *Pentane Emissions Profile for Expanded Polystyrene Foam Manufacturing Industry.* Austin, TX: URS Corporation.

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APPENDIX B – MODELING MEMO

MEMORANDUM

DATE: January 18, 2019

TO: Tom Burnham, P.E., Permit Writer, Air Program

FROM: Darrin Mehr, Modeling Review Analyst, Air Program

PROJECT: P-2007.0228 PROJ 62144, PTC modification to increase annual allowable VOCs emissions and incorporate one exempted boiler at the Foam Molders, Inc., facility located near Post Falls, Idaho.

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

Acronyms, Units, and Chemical Nomenclature

AAC	Acceptable Ambient Concentration of a non-carcinogenic TAP
AACC	Acceptable Ambient Concentration of a Carcinogenic TAP
Appendix W	40 CFR 51, Appendix W – Guideline on Air Quality Models
BRC	Below Regulatory Concern
CFR	Code of Federal Regulations
CAMx	Comprehensive Air Quality Model with Extensions
CMAQ	Community Multi-Scale Air Quality Modeling System
CO	Carbon Monoxide
DEQ	Idaho Department of Environmental Quality
DV	Design Values
EL	Emissions Screening Level of a TAP
EPA	United States Environmental Protection Agency
FMI	Foam Molders, Inc.
hr	hours
Idaho Air Rules	Rules for the Control of Air Pollution in Idaho, located in the Idaho Administrative Procedures Act 58.01.01
lb/hr	Pounds per hour
MERP	Model Emissions Rates for Precursors
MMBtu	Million British Thermal Units
NAAQS	National Ambient Air Quality Standards
NO	Nitrogen Oxide
NO_2	Nitrogen Dioxide
NOx	Oxides of Nitrogen
NW AIRQUEST	Northwest International Air Quality Environmental Science and Technology Consortium
O_3	Ozone
Pb	Lead
PM_{10}	Particulate matter with an aerodynamic particle diameter less than or equal to a nominal 10 micrometers
$PM_{2.5}$	Particulate matter with an aerodynamic particle diameter less than or equal to a nominal 2.5 micrometers
ppb	parts per billion
PSD	Prevention of Significant Deterioration
PTC	Permit to Construct
PTE	Potential to Emit
SIL	Significant Impact Level
SO_2	Sulfur Dioxide
TAP	Toxic Air Pollutant
TPY	Tons per year
UTM	Universal Transverse Mercator
VOC	Volatile Organic Compounds
$\mu g/m^3$	Micrograms per cubic meter of air

1.0 Summary

FMI submitted a Permit to Construct (PTC) application for a modification to their existing facility located near Post Falls, Idaho. DEQ evaluated whether project-specific air quality analyses involving atmospheric dispersion modeling of estimated emissions associated with the proposed modification were required to demonstrate that applicable emissions do not result in violation of a National Ambient Air Quality Standard (NAAQS) or Toxic Air Pollutant (TAP) increment as required by the Idaho Administrative Procedures Act 58.01.01.203.02 and 203.03 (Idaho Air Rules Section 203.02 and 203.03). This memorandum provides a summary of the applicability assessment for analyses and air impact analyses used to demonstrate compliance with applicable NAAQS and TAP increments, as required by Idaho Air Rules Section 203.02 and 203.03.

FMI prepared the PTC application for this project. DEQ review of submitted data and DEQ analyses summarized by this memorandum addressed only the rules, policies, methods, and data pertaining to the air impact analyses used to demonstrate that estimated emissions associated with operation of the facility will not cause or significantly contribute to a violation of any applicable air quality standard. This review did not address/evaluate compliance with other rules or analyses not pertaining to the air impact analyses. Evaluation of emission estimates was the responsibility of the DEQ permit writer and is addressed in the main body of the DEQ Statement of Basis, and emission calculation methods were not evaluated in this modeling review memorandum.

Table 1 presents key assumptions and results to be considered in the development of the permit. Idaho Air Rules require air impact analyses be conducted in accordance with methods outlined in 40 CFR 51, Appendix W *Guideline on Air Quality Models* (Appendix W). Appendix W requires that air quality impacts be assessed using atmospheric dispersion models with emissions and operations representative of design capacity or as limited by a federally enforceable permit condition.

The submitted information and analyses: 1) utilized appropriate methods and models; 2) was conducted using reasonably accurate or conservative model parameters and input data (review of emission 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 estimated potential/allowable emissions are at a level defined as below regulatory concern (BRC) and do not require a NAAQS compliance demonstration; b) that predicted pollutant concentrations from emissions associated with the project as modeled were below Significant Impact Levels (SILs) or other applicable regulatory thresholds; or c) that predicted pollutant concentrations from emissions associated with the project, when appropriately combined with co-contributing sources and background concentrations, were below applicable NAAQS at ambient air locations where and when the project has a significant impact; 5) showed that TAP emission increases associated with the project will not result in increased ambient air impacts exceeding allowable TAP increments. This conclusion assumes that conditions in Table 1 are representative of facility design capacity or operations as limited by a federally enforceable permit condition. The DEQ permit writer should use Table 1 and other information presented in this memorandum to generate appropriate permit provisions/restrictions to assure emissions do not exceed applicable regulatory thresholds requiring further analyses and to assure the requirements of Appendix W are met regarding emissions representative of design capacity or permit allowable rates.

Summary of Submittals and Actions

- November 19, 2018: DEQ received a permit application from FMI.
- November 21, 2018: Regulatory Start Date.
- December 4, 2018: Application determined complete by DEQ.

Table 1. KEY ASSUMPTIONS USED IN MODELING ANALYSES	
Criteria/Assumption/Result	**Explanation/Consideration**
Air Impact Analyses for Criteria Pollutant Emissions. The facility-wide allowable emission rates of all criteria pollutants are below levels defined as BRC for $PM_{2.5}$, PM_{10}, SO_2, and CO. Facility-wide emissions of NOx and VOCs exceed the BRC thresholds. The project's NOx emission increase is below the BRC threshold.	Project-specific air impact analyses demonstrating compliance with NAAQS, as required by Idaho Air Rules Section 203.02, are required for pollutant increases above BRC thresholds, or for pollutants having an emissions increase that is greater than Level I modeling applicability thresholds (where the BRC exclusion cannot be used).
Air Impact Analyses for Emissions for Ozone for Increased Emissions of Volatile Organic Compounds. The project increases annual allowable emissions of process VOCs from 95 TPY to 200 TPY. Short-term daily and hourly VOCs emissions will not be increased above the current 2,856 lb/day emission limit. The project NOx emission increase of 1.46 TPY for the project are well below the minimum MERP value of 199 TPY.	The ozone NAAQS is based on the daily maximum 8-hour average concentration only. There isn't an annual average ozone NAAQS. The project does not increase hourly or daily VOCs emissions. NOx emissions increases are below the minimum MERP and will not cause an increase above the 1.0 ppb SIL for the 8-hour ozone standard. The modification project does require an ozone compliance demonstration for VOCs emissions.
Air Impact Analyses for TAP Emissions. TAPs modeling was not required for this project.	A TAP increment compliance demonstration would be required for any TAPs with emissions above ELs. All TAPs increases were below the applicable ELs.

[a] Particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers.
[b] Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers.

2.0 Background Information

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

2.1 Project Description

The FMI is located near Post Falls, Idaho. Pollutant-emitting processes conducted at the facility include:

- An existing expanding polystyrene bead and foam packaging molding process equipment
- Two existing 6.3 MMBtu/hr natural gas-fired boilers
- One new 3.4 MMBtu/hr natural gas-fired boiler issued a PTC exemption concurrence in May 2018

The PTC addresses all air pollutant-emitting activities associated with the facility.

2.2 Proposed Location and Area Classification

The facility is located near Post Falls, within Kootenai County (Northing: 5,289,491.0 m; Easting: 501,714.0 m; UTM Zone 11). 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

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:

> ***02. 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

If specific criteria pollutant emission increases associated with the proposed permitting project cannot qualify for a BRC exemption as per Idaho Air Rules Section 221, then the permit cannot be issued unless the application demonstrates that applicable emission increases will not cause or significantly contribute to a violation of NAAQS, as required by Idaho Air Rules Section 203.02.

The first phase of a NAAQS compliance demonstration is to evaluate whether the proposed facility/project could have a significant impact to ambient air. Section 3.1.1 of this memorandum describes the applicability evaluation of Idaho Air Rules Section 203.02. 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 in accordance with methods outlined in Appendix W. 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 emission 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.

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 potential/allowable emissions resulting from the project and emissions from any nearby co-contributing sources (including existing emissions from the facility that are unrelated to the project), 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.

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	0.2	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]	70 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.

If the cumulative NAAQS impact analysis indicates a potential 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. If project-specific impacts are below the SIL, then the project does not have a significant contribution to the specific violations.

Compliance with Idaho Air Rules Section 203.02 is generally demonstrated if: a) applicable specific criteria pollutant emission increases are at a level defined as BRC, using the criteria established by DEQ regulatory interpretation[1]; or b) all modeled impacts of the SIL analysis are below the applicable SIL or other level determined to be inconsequential to NAAQS compliance; or c) 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 d) 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 Section 210, if the total project-wide emission 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 emission 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. The DEQ permit writer evaluates the applicability of specific TAPs to the Section 210.20 exclusion.

3.0 Analytical Methods and Data

This section describes the methods and data used in the analyses to demonstrate compliance with applicable air quality impact requirements. The DEQ Statement of Basis provides a discussion of the methods and data used to estimate criteria and TAP emission rates.

3.1 Emission Source Data

Emissions of criteria pollutants and TAPs resulting from operation of the proposed modification were estimated by FMI and also DEQ for various applicable averaging periods. The calculation of potential emissions is the responsibility of the DEQ permit writer, and the representativeness and accuracy of emission estimates is not addressed in this modeling memorandum. DEQ air impact analysts are responsible for assuring that potential emission rates provided in the emission inventory are properly used in the model. The rates listed must represent the maximum allowable rate as averaged over the specified period.

Emission rates used in the impact modeling applicability analyses and any modeling analyses, as listed in this memorandum, should be reviewed by the DEQ permit writer and compared with those in the project's final emission inventory.

3.1.1 Modeling Applicability and Modeled Criteria Pollutant Emission Rates

If project-specific emission increases for criteria pollutants would qualify for a BRC permit exemption as per Idaho Air Rules Section 221 if it were not for potential emissions of one or more pollutants exceeding

the BRC threshold of 10 percent of emissions defined by Idaho Air Rules as significant, then a NAAQS compliance demonstration may not be required for those pollutants with emissions below BRC levels. DEQ's regulatory interpretation policy of exemption provisions of Idaho Air Rules 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.[1]" The interpretation policy also states that the exemption criteria of uncontrolled potential to emit (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. The BRC exemption cannot be used to exempt a project from a pollutant-specific NAAQS compliance demonstration in most cases where a PTC is required for the action regardless of emission quantities, such as the modification of an existing emission or throughput limit.

A NAAQS compliance demonstration must be performed for pollutant increases that would not qualify for the BRC exemption from the requirement to demonstrate compliance with NAAQS.

Site-specific air impact modeling analyses may not be necessary for some pollutants, even where such emissions do not qualify for the BRC exemption. DEQ has developed modeling applicability thresholds, below which a site-specific modeling analysis is not required. DEQ generic air impact modeling analyses that were used to develop the modeling thresholds provide a conservative SIL analysis for projects with emissions below identified threshold levels. Project-specific modeling applicability thresholds are provided in the *Idaho Air Modeling Guideline*[2]. These thresholds were based on assuring an ambient impact of less than the established SIL for specific pollutants and averaging periods.

If total project-specific emission rate increases of a pollutant are below Level I Modeling Applicability Thresholds, then project-specific air impact analyses are not necessary for permitting. Use of Level II Modeling Applicability Thresholds are conditional, requiring DEQ approval. DEQ approval is based on dispersion-affecting characteristics of the emission sources such as stack height, stack gas exit velocity, stack gas temperature, distance from sources to ambient air, presence of elevated terrain, and potential exposure to sensitive public receptors.

NAAQS compliance demonstrations were not required for this project since the submitted application demonstrated that the project qualified for the BRC NAAQS compliance demonstration exemptions.

Table 3 provides a comparison between facility-wide allowable emissions and BRC levels. An emission inventory for the facility reflecting 8,760 hours per year of operation of the three natural gas-fired boilers and the process equipment at the requested 200 TPY of VOCs was provided in the project's statement of basis. The project included one new 3.4 MMBtu/hr natural gas-fired boiler of 1.46 T/yr of NO_x, with stand-alone emissions limits to be applied in the PTC. No increase to an existing emission rate limit was required to incorporate the new boiler in the PTC.

The BRC policy[1] allows criteria pollutants to be evaluated for an exemption from modeling requirements based on an individual pollutant basis. The project's emission increase for each pollutant is compared against the emission rates qualifying for a Category I exemption, commonly referred to as BRC, and if one or more criteria pollutant(s) meet(s) the exemption criteria, all other criteria pollutants are not subject to modeling requirements solely due to those pollutants that exceed the BRC thresholds being subject to modeling. This project qualifies for a BRC exemption for $PM_{2.5}$, PM_{10}, SO_2, Pb, CO, and NO_x. The project's VOCs emissions do not qualify for a modeling exemption based on a BRC exemption. VOCs emissions are regulated as a precursor for O_3 formation under the O_3 NAAQS. This project's VOCs

emissions are not exempted from modeling based on DEQ's BRC policy. Primary NO_x emissions are regulated under the NO_x NAAQS and also as an O_3 precursor pollutant causing the secondary formation of O_3. DEQ's evaluation of O_3 modeling applicability is discussed further below.

Table 3. CRITERIA POLLUTANT NAAQS COMPLIANCE DEMONSTRATION APPLICABILITY

Criteria Pollutant	BRC Level (ton/year)	Facility-Wide Emissions Basis		Project Increase Basis	
		Applicable Facility-Wide PTE Emissions (ton/year)	Air Impact Analyses Required Based on Facility-wide Emissions?	Project-Specific Emissions Increase (ton/year)	Air Impact Analyses Required Based on Project Emissions?
PM_{10}[a]	1.5	0.51	No	NA	NA
$PM_{2.5}$[b]	1.0	0.51	No	NA	NA
Carbon Monoxide (CO)	10.0	5.65	No	NA	NA
Sulfur Dioxide (SO_2)	4.0	0.05	No	NA	NA
Nitrogen Oxides (NOx)	4.0	5.26	Yes	1.46	No
Lead (Pb)	0.06	3.4E-05	No	NA	NA
Volatile Organic Compounds (VOCs)	4.0	200	Yes[c]	104.88	Yes[c]

a. Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers.
b. Particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers.
c. Further evaluation of modeling requirements is required of VOCs emissions as precursor emissions for formation of ozone for the 8-hour ozone SIL and NAAQS under the BRC criteria.

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 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 within the context of permitting a new stationary source 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."*

DEQ has determined it was not appropriate or necessary to require a quantitative source-specific O_3

impact analysis because allowable emission estimates of VOCs will not increase on a short-term average basis. Daily and hourly emissions of VOCs will not increase. A typical modification would include both short term and long term emissions increases, but this project is limited only to an annual increase in VOCs.

Both VOCs and NO_x are precursor pollutants for the formation of ground level O_3 and EPA has issued draft guidance establishing suggested default minimum threshold values referred to as "Modeled Emission Rates for Precursors (MERPs)[3, 4]. Extensive modeling was conducted using two generic cases of hypothetical sources with Eulerian grid models, which include CAMx and CMAQ. The MERP values represent the amount of precursor emissions from a hypothetical single source that would cause a maximum downwind concentration equal to the SIL, which is 1.0 ppb[5] for the 8-hour average O_3 standard.

The evaluation process is broken into an in initial Tier 1 demonstration and, if the project exceeds the applicability criteria, a secondary Tier 2 "cumulative" analysis is required. The latest illustrative MERP values were presented by EPA in a slide format[3] and included a subset of MERP values for NOx and VOCs for the "northwest" climate zone, as listed below in Table 4. These values are current at this time and are described as draft and subject to change. MERPs may be applied in areas classified as attainment or unclassifiable, and the facility location meets this criteria. The ambient background concentration is a supporting factor, and the background value for ozone is 55 ppb, 8-hour average, daily maximum, as obtained from the NW AIRQUEST lookup tool. The lookup tool may be accessed at the website address: http://lar.wsu.edu/nw-airquest/lookup.html.

Table 4. EPA Illustrative MERP Values in Tons per Year for Ozone Formation

Climate Zone	8-hour Ozone from NOx[a]			8-hour Ozone from VOCs[b]		
	Minimum	Median	Highest	Lowest	Median	Highest
Northwest	199	373	4,031	1,049	2,399	15,929

[a] Nitrogen oxides.
[b] Volatile organic compounds.

Ozone formation is affected by the synergistic effects of NO_x and VOCs. These effects can be disregarded for this project because DEQ has determined that daily VOCs emissions will not increase so there will be no increase in ambient O_3 concentrations caused by VOCs. DEQ concludes that the annual increase in emissions of VOCs is not subject to short term averaging period O_3 modeling for this project. There is a 0.33 lb/hr NOx increase associated with new Boiler C, with a corresponding annual emissions increase of 1.46 TPY. DEQ compared the 1.46 TPY NOx increase against the 199 TPY minimum MERP value and concluded that O_3 formation and any modeling demonstration requirements are not warranted for a project with an emission increase of less than 1% of the NO_x MERP.

3.1.2 TAPs Modeling Applicability

TAP emission regulations under Idaho Air Rules Section 210 are only applicable for new or modified sources constructed after July 1, 1995.

Project-related emissions of all TAPs for this project were below the applicable emission screening levels (ELs) of Idaho Air Rules Section 585 or 586. Air impact modeling analyses were not required to demonstrate that maximum impacts are below applicable ambient increment standards expressed in Idaho Air Rules Section 585 and 586 as AACs and AACCs.

4.0 Conclusions

The information submitted with the PTC application, combined with DEQ air impact analyses, demonstrated to DEQ's satisfaction that emissions from the FMI facility will not cause or significantly contribute to a violation of any applicable ambient air quality standard or TAP increment.

References

1. *Policy on NAAQS Compliance Demonstration Requirements.* Idaho Department of Environmental Quality Policy Memorandum. July 11, 2014.

2. *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.

3. *Update on MERPs Guidance* Office of Air Quality Planning and Standards. Environmental Protection Agency. Air Quality Modeling Group. Research Triangle Park, NC. Presentation Slides from Tyler Fox and Kirk Baker. June 5, 2018.

4. *Guidance on the Development of Modeled Emission Rates for Precursors (MERPs) as a Tier I Demonstration Tool for Ozone and $PM_{2.5}$ under the PSD Permitting Program."* Environmental Protection Agency. Office of Air Quality Planning and Standards. Air Quality Modeling Group. Research Triangle Park, NC. Guidance memorandum and Attachment Document EPA-454/R-16-006 from Richard A. Wayland to Regional Dispersion Modeling Contacts. December 2, 2016.

5. *Guidance on Significant Impact Levels for Ozone and Fine Particles in the Prevention of Significant Deterioration Permitting Program.* Environmental Protection Agency. Office of Air Quality Planning and Standards. Research Triangle Park, NC. Guidance memorandum from Peter Tsirigotis to Regional Air Division Directors. April 17, 2018.

APPENDIX C – 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: Foam Molders Inc
Address: 9456 N. McGuire Rd
City: Post Falls
State: ID
Zip Code: 83854
Facility Contact: Tony Bremer
Title: Sales and Marketing Manager
AIRS No.: 055-00047

N	Does this facility qualify for a general permit (i.e. concrete batch plant, hot-mix asphalt plant)? Y/N
Y	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_X	1.5	0	1.5
SO_2	0.0	0	0.0
CO	1.2	0	1.2
PM10	0.1	0	0.1
VOC	104.9	0	104.9
Total:	0.0	0	**107.7**
Fee Due	**$ 7,500.00**		

Comments: