Statement of Basis

Permit to Construct No. P-2017.0011
Project ID 61851

Blackfoot Facility of Basic American Foods
Blackfoot, Idaho

Facility ID 011-00012

Final

July 31, 2017
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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

AAC	acceptable ambient concentrations
AACC	acceptable ambient concentrations for carcinogens
acfm	actual cubic feet per minute
ASTM	American Society for Testing and Materials
BACT	Best Available Control Technology
BAF	Blackfoot Facility of Basic American Foods
BAPCI	Basic American Potato Company, Inc.
BMP	best management practices
Btu	British thermal units
CAA	Clean Air Act
CAM	Compliance Assurance Monitoring
CAS No.	Chemical Abstracts Service registry number
CEMS	continuous emission monitoring systems
cfm	cubic feet per minute
CFR	Code of Federal Regulations
CI	compression ignition
CMS	continuous monitoring systems
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	CO_2 equivalent emissions
COMS	continuous opacity monitoring systems
DEQ	Department of Environmental Quality
dscf	dry standard cubic feet
EL	screening emission levels
EPA	U.S. Environmental Protection Agency
FEC	Facility Emissions Cap
GHG	greenhouse gases
gph	gallons per hour
gpm	gallons per minute
gr	grains (1 lb = 7,000 grains)
HAP	hazardous air pollutants
HHV	higher heating value
hp	horsepower
hr/yr	hours per consecutive 12 calendar month period
ICE	internal combustion engines
IDAPA	a numbering designation for all administrative rules in Idaho promulgated in accordance with the Idaho Administrative Procedures Act
iwg	inches of water gauge
km	kilometers
lb/hr	pounds per hour
lb/qtr	pound per quarter
m	meters
MACT	Maximum Achievable Control Technology
mg/dscm	milligrams per dry standard cubic meter
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

O&M	operation and maintenance
O_2	oxygen
PAH	polyaromatic hydrocarbons
PC	permit condition
PCB	polychlorinated biphenyl
PERF	Portable Equipment Relocation Form
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
ppmvd	parts per million by volume, dry
ppmw	parts per million by weight
PSD	Prevention of Significant Deterioration
psig	pounds per square inch gauge
PTC	permit to construct
PTC/T2	permit to construct and Tier II operating permit
PTE	potential to emit
PW	process weight rate
RAP	recycled asphalt pavement
RFO	reprocessed fuel oil
RICE	reciprocating internal combustion engines
Rules	*Rules for the Control of Air Pollution in Idaho*
scf	standard cubic feet
SCL	significant contribution limits
SIC	Standard Industrial Classification
SIL	Significant Impact Level
SIP	State Implementation Plan
SM	synthetic minor
SM80	synthetic minor facility with emissions greater than or equal to 80% of a major source threshold
SO_2	sulfur dioxide
SO_x	sulfur oxides
T/day	tons per calendar day
T/hr	tons per hour
T/yr	tons per consecutive 12 calendar month period
T2	Tier II operating permit
TAP	toxic air pollutants
TEQ	toxicity equivalent
T-RACT	Toxic Air Pollutant Reasonably Available Control Technology
ULSD	ultra-low sulfur diesel
U.S.C.	United States Code
VOC	volatile organic compounds
$\mu g/m^3$	micrograms per cubic meter

FACILITY INFORMATION

Description

Blackfoot Facility of Basic American Foods (BAF), a division of Basic American, Inc. is a manufacturer of dried food products and is located at 415 West Collins Road, Blackfoot. Basic American Potato Company, Inc. (BAPCI) is a potato processing company and is located at 409 West Collins Road, Blackfoot, Idaho. Because BAPCI and BAF have the same owner, are adjacent, and have same first two digits of Standard Industrial Classification (SIC) code, the two plants are considered as one Tier I source or Tier I facility. The facility is classified as an existing major stationary source, as defined in 40 CFR 52.21(b)(1), because the facility is a designated facility as defined in 40 CFR 52.21(b)(1)(i)(a) and because the estimated emissions of $PM_{2.5}/PM_{10}$, SO_2, NO_X, and CO have the potential to exceed major stationary source thresholds of 100 tons per year.

The new production line to be installed at BAF will prepare dried vegetable product from a combination of fresh vegetables and previously dried vegetables. Detailed process description of the new production line can be found in the application (2017AAG831) or in the permit. (2017AAG1243)

Permitting History

This is the initial PTC for this new production line, and therefore, there is no permitting history for it. For the rest of the facility, permitting history can be found in the statement of basis of the current Tier I operating permit.

Application Scope

This permit is the initial PTC for a new production line at an existing major facility. This new production line includes a two-stage pre-dryer (has two burners) and a dryer, operated in series and a 5 MMBtu/hr natural gas directly fired air make-up unit that provides comfort heating in the area where the new production line will be located. The new production line will use steam generated from the existing Boiler 1 and Boiler 2.

Application Chronology

January 13, 2017	DEQ received an application fee.
February 15, 2017	DEQ received an application.
March 15, 2017	DEQ determined that the application was incomplete.
March 23, 2017	DEQ received supplemental information from the applicant.
April 18, 2017	DEQ determined that the application was incomplete the second time.
April 20 & 27, 2017	DEQ received a revised application in electronic format and hard copy from the applicant.
May 5, 2017	DEQ determined that the application was complete.
June 12, 2017	DEQ made available the draft permit and statement of basis for peer and regional office review.
June 30, 2017	DEQ made available the draft permit and statement of basis for applicant review.
July 5, 2017	DEQ received the permit processing fee.
July 20, 2017	DEQ made available the 2nd draft permit and statement of basis for applicant review.
July 31, 2017	DEQ issued the final permit and statement of basis.

TECHNICAL ANALYSIS

Emissions Units and Control Equipment

Table 1 EMISSIONS UNIT AND CONTROL EQUIPMENT INFORMATION[1]

Source ID No.	Sources	Control Equipment
PREDRYER	Predryer Manufacturer: Industrial Metal Enterprises Model: custom First stage burner model: Low NOx burner, 25 ppmvd @ 3% O_2 Manufacturer: Winnox Eclipse Model: CROSSFIRE Heat input rating: 6.0 MMBtu/hr Second stage burner model: Low NOx burner, 20 ppmvd @ 3% O_2 Manufacturer: Winnox Eclipse Model: WX0200 Heat input rating: 2.0 MMBtu/hr Manufacture date: 4/1/2017 Max. production: 70,000 lb/day finished product Fuel: natural gas	None
DRYER	Dryer Manufacturer: Buhler Aeroglide Model: C1 144-132 RGX Burner model: Low-NOx burner, 10 ppmvd @ 3% O_2 Manufacturer: Winnox Eclipse Model: WX0200 Heat input rating: 5.0 MMBtu/hr Manufacture date: 4/1/2017 Max. production: 70,000 lb/day finished product Fuel: natural gas	Wet Venturi Scrubber Manufacturer: EnviroCare Model: MicroMist Pressure drop across throat: 17 inch H_2O Operating pressure range: 17 to 25 inch H_2O Recirculation rate: 178 gpm Inlet gas flow: 39,700 ACFM $PM_{10}/PM_{2.5}$ control efficiency: 75.0%
AMU	Air Makeup Unit Manufacturer: Reyco Model: Ventpac 60 Burner Model: Low NOx burner, 25 ppmvd @ 3% O_2 Burner Manufacturer: Winnox Eclipse Model: CROSSFIRE Manufacture Date: 4/1/2017 Heat input rating: 5.0 MMBtu/hr Fuel: natural gas	None

[1] Refer to modeling memo for the stack parameters.

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 new production line at the facility (see Appendix A) associated with this proposed project. Emissions estimates of criteria pollutant PTE were based on emission factors from source test data of a similar production line at Blackfoot Facility of Basic American Food, AP-42, process information specific to the facility for the proposed project, production line operating at 8,760 hr/yr, and space heaters operating at 4,380 hr/yr (50% of the time). HAP PTE is based on AP-42, process information specific to the facility for the proposed project, production line operating at 8,760 hr/yr, and space heaters operating at 4,380 hr/yr (50% of the time).

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 a new production line at an existing facility. Therefore, pre-project emissions are set to zero for all criteria pollutants for this production line.

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. The PTE from the new production line is provided by the applicant and verified by DEQ staff. The PTE from the existing emissions units are taken from the existing permits. See Appendix A for a detailed presentation of the calculations of these emissions for the new production line.

Table 2 POST PROJECT POTENTIAL TO EMIT FOR REGULATED AIR POLLUTANTS

	PM_{10}	$PM_{2.5}$	SO_2	NO_X	CO	VOC	Lead
Basic American Potato Company, Inc.[1]	138.38	135.30	0.55	80.68	77.40	5.07	4.61E-04
Blackfoot Facility of Basic American Foods [2]	106.51	106.51	161.6	241.4	248.4	8.3	2.16E-03
the new production line of this project[3]	1.73	1.51	0.15	1.61	5.59	0.37	3.33E-05
Facility-Wide PTE (T/yr)[4]	246.62	243.32	162.3	323.69	331.39	13.74	2.65E-03

[1] Taken from the statement of basis for Tier I Operating Permit No. T1-2008.0077 Project ID 61650 issued on January 29, 2016.
[2] Taken from statement of basis for Tier I Operating Permit No. T1-2012.0030 Project 61058 issued on July 23, 2013.
[3] PTE from the new production line minus emissions increase from Boiler No.1 and Boiler No. 2 as the emissions increase of the boilers has been included in the previous facility-wide PTE for Blackfoot Facility of Basic American Foods.
[4] 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 3 CHANGES IN POTENTIAL TO EMIT FOR REGULATED AIR POLLUTANTS

Changes in Potential to Emit	PM_{10}	$PM_{2.5}$	SO_2	NO_X	CO	VOC	Lead
The new production line of this project	1.73	1.51	0.15	1.61	5.59	0.37	3.33E-05

The facility is a designated facility as defined in 40 CFR 52.21(b)(1)(i)(a) because the facility's fossil-fuel boilers have total heat input rate of more than 250 MMBtu/hr. As presented previously in Table 2, the pre-project facility-wide potential to emit exceeds 100 T/yr for $PM_{10}/PM_{2.5}$, SO_2, NOx and CO. Therefore, a PSD applicability analysis is required for this project.

Projected Actual Emissions

The procedure used by the facility for calculating Projected Actual emissions was the calculation approach for the new production line set forth in 40 CFR 52.21, beginning with definitions in 52.21(b)(4). Using these procedures, Projected Actual criteria pollutant emissions and fugitive source emissions were calculated. For the new production line, Projected Actual emissions are the same as its PTE and are presented in the following table:

Table 4 PROJECTED ACTUAL EMISSIONS

Emissions Unit	CO	NOx	SO_2	PM_{10}	$PM_{2.5}$	VOC	Pb
	T/yr	T/yr	T/yr	T/yr	T/yr	T/yr	T/yr
Point Sources							
Predryer and dryer	5.59	1.61	0.15	1.73	1.51	0.37	3.33E-05
Boiler 1 and Boiler 2 Stack [1]	---	---	---	---	---	---	---
Quantifiable Fugitive Sources							
Quantifiable fugitive emissions	0	0	0	0	0	0	0
Facility Totals							
Total, Projected Actual Emissions	5.59	1.61	0.15	1.73	1.51	0.37	3.33E-05

[1] The applicant did not calculate the Projected Actual Emissions for Boilers 1 and 2 instead the applicant provided the emissions increase from the maximum increased utilization of Boilers 1 and 2 as a result of installing the new production line. Refer to Table 6 for the emissions increase.

Baseline Actual Emissions

The procedure used by the facility for calculating Baseline Actual emissions was the calculation approach for the new production line set forth in 40 CFR 52.21, beginning with definitions in 52.21(b)(48)(iii). Using these procedures, Baseline Actual criteria pollutant emissions and fugitive source emissions were calculated. For the new production line, Baseline Actual emissions are zero. The applicant did not calculate the Baseline Actual Emissions for Boilers 1 and 2 instead the applicant provided the emissions increase from the utilization increase of Boilers 1 and 2 as a result of installing the new production line. Refer to Table 5 for the emissions increase.

Project Emissions Increase

The project emissions increase is presented in the following table:

Table 5 PROJECT EMISSIONS INCREASE[2]

Emissions Unit	CO	NOx	SO2	PM10	PM2.5	VOC	Pb
	T/yr	T/yr	T/yr	T/yr	T/yr	T/yr	T/yr
Predryer and Dryer	5.59	1.61	0.15	1.73	1.51	0.37	3.33E-05
Boilers 1 and 2[1]	0.41	1.78	2.25	0.09	0.09	0.03	4.89E-05
Project Emissions Increase	6.00	3.39	2.41	1.82	1.60	0.39	8.22E-05

[1] emissions increase as a result of Boilers 1 and 2 generating more steam to be used in the new production line. (Increased utilization of Boilers 1 and 2)
[2] Greenhouse gas emissions calculation is not required for this table in accordance with 52.21(b)(49)(iii) and (iv).

Comparison of the Project Emissions Increase to the PSD Significance Thresholds

The comparison of the change in projected actual emissions from baseline actual emissions to the PSD significance thresholds is presented in the following table.

Table 6 COMPARISON OF THE PROJECT EMISSIONS INCREASE TO THE PSD MAJOR MODIFICATION THRESHOLDS

Emissions Unit	CO	NOx	SO_2	PM_{10}	$PM_{2.5}$	VOC	Pb
	T/yr	T/yr	T/yr	T/yr	T/yr	T/yr	T/yr
Project Emissions Increase	6.00	3.39	2.41	1.82	1.60	0.39	8.22E-05
PSD Significance Emission Rate (SER) *See 40 CFR 52.21(b)(23)*	**100**	**40**	**40**	**15**	**10**	**40**	**0.6**
Does the Project Emissions Increase Exceed the Significant Emission Rate Threshold?	**No**	**No**	**No**	**No**	**No**	**No**	**No**

As presented in the preceding table, this project does not constitute a PSD Major Modification and is not subject to PSD permitting requirements.

Non-Carcinogenic TAP Emissions

Pre- and post-project, as well as the change in, non-carcinogenic TAP emissions are presented in the following table:

Table 7 PRE- AND POST PROJECT POTENTIAL TO EMIT FOR NON-CARCINOGENIC TOXIC AIR POLLUTANTS

Carcinogenic Toxic Air Pollutants	24-Hour Average Emissions Rate, lb/hr			Non-Carcinogen Screening Emissions Level, lb/hr*	Screening Level Comparison	
	Pre-Project	Post-Project	Net Change		Exceeds Level? (Y/N)	Percent of Screening Level
Dichlorobenzene (mixed isomers)	0.00E+00	2.12E-05	2.12E-05	2.00E+01	No	0.0%
Hexane	0.00E+00	3.18E-02	3.18E-02	1.20E+01	No	0.3%
Naphthalene	0.00E+00	1.08E-05	1.08E-05	3.33E+00	No	0.0%
Pentane	0.00E+00	4.59E-02	4.59E-02	1.18E+02	No	0.0%
Toluene	0.00E+00	6.00E-05	6.00E-05	2.50E+01	No	0.0%
Chromium	0.00E+00	2.47E-05	2.47E-05	3.30E-02	No	0.1%
Cobalt	0.00E+00	1.48E-06	1.48E-06	3.30E-03	No	0.0%
Manganese	0.00E+00	6.71E-06	6.71E-06	3.33E-01	No	0.0%
Selenium	0.00E+00	4.23E-07	4.23E-07	1.30E-02	No	0.0%

Because none of the 24-hour average non-carcinogenic screening ELs identified in IDAPA 58.01.01.585 were exceeded, modeling is not required for any non-carcinogenic TAP

Carcinogenic TAP Emissions

A summary of the estimated PTE for emissions increase of carcinogenic toxic air pollutants (TAP) is provided in the following table.

Table 8 PRE- AND POST PROJECT POTENTIAL TO EMIT FOR CARCINOGENIC TOXIC AIR POLLUTANTS

Carcinogenic Toxic Air Pollutants	Annual Average Emissions Rate, lb/hr			Carcinogen Screening Emissions Level, lb/hr	Screening Level Comparison	
	Pre-Project	Post-Project	Net Change		Exceeds Level? (Y/N)	Percent of Screening Level
Polycyclic Organic Matter (ID POM Summation) [1]	0.00E+00	2.01E-07	2.01E-07	2.00E-06	No	10.1%
Acenaphthene	0.00E+00	3.18E-08	3.18E-08	9.10E-05	No	0.0%
Acenaphthylene	0.00E+00	3.18E-08	3.18E-08	9.10E-05	No	0.0%

Carcinogenic Toxic Air Pollutants	Annual Average Emissions Rate, lb/hr			Carcinogen Screening Emissions Level, lb/hr	Screening Level Comparison	
	Pre-Project	Post-Project	Net Change		Exceeds Level? (Y/N)	Percent of Screening Level
Anthracene	0.00E+00	4.24E-08	4.24E-08	9.10E-05	No	0.0%
Benz(a)anthracene	0.00E+00	3.18E-08	3.18E-08	NA (ID POM Summation)		
Benzene	0.00E+00	3.71E-05	3.71E-05	8.00E-04		
Benzo(a)pyrene	0.00E+00	2.12E-08	2.12E-08	NA (ID POM Summation)		
Benzo(b)fluoranthene	0.00E+00	3.18E-08	3.18E-08	NA (ID POM Summation)		
Benzo(g,h,i)perylene	0.00E+00	2.12E-08	2.12E-08	9.10E-05	No	0.0%
Benzo(k)fluoroanthene	0.00E+00	3.18E-08	3.18E-08	NA (ID POM Summation)		
Chrysene	0.00E+00	3.18E-08	3.18E-08	NA (ID POM Summation)		
Dibenzo(a,h)anthracene	0.00E+00	2.12E-08	2.12E-08	NA (ID POM Summation)		
7,12-Dimethylbenz(a)anthracene	0.00E+00	2.82E-07	2.82E-07	9.10E-05	No	0.3%
Fluoranthene	0.00E+00	5.29E-08	5.29E-08	9.10E-05	No	0.1%
Fluorene	0.00E+00	4.94E-08	4.94E-08	9.10E-05	No	0.1%
Formaldehyde	0.00E+00	1.32E-03	1.32E-03	5.10E-04	Yes	259.5%
Indeno(1,2,3-cd)pyrene	0.00E+00	3.18E-08	3.18E-08	NA (ID POM Summation)		
2-Methylnaphthalene	0.00E+00	4.24E-07	4.24E-07	9.10E-05	No	0.5%
3-Methylchloroanthene	0.00E+00	3.18E-08	3.18E-08	9.10E-05	No	0.0%
Phenanthrene	0.00E+00	3.00E-07	3.00E-07	9.10E-05	No	0.3%
Pyrene	0.00E+00	8.82E-08	8.82E-08	9.10E-05	No	0.1%
Arsenic	0.00E+00	3.53E-06	3.53E-06	1.50E-06	Yes	235.2%
Beryllium	0.00E+00	2.12E-07	2.12E-07	2.80E-05	No	0.8%
Cadmium	0.00E+00	1.94E-05	1.94E-05	3.70E-06	Yes	525.4%
Chromium (VI)	0.00E+00	1.23E-06	1.23E-06	5.60E-07	Yes	220.5%
Nickel	0.00E+00	3.71E-05	3.71E-05	2.70E-05	Yes	137.3%

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

Some of the emissions increases for carcinogenic TAP exceed their respective ELs as a result of this project. Therefore, modeling is required for these TAP.

Post Project HAP Emissions

The following table presents the post project potential to emit for HAP 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 9 HAZARDOUS AIR POLLUTANTS EMISSIONS POTENTIAL TO EMIT SUMMARY

Fuel Combustion Activity	Maximimum Fuel Combustion		Total HAP Emission Factor		Maximum HAP Emissions, tons/yr
	Amount	Units	Emission Factor	Units	
Total Installed NG Firing Capacity	438.00	MMBtu/hr	1.85E-03	lb/MMBtu	3.55
Maximum Permitted #6 Oil Combustion	4,097,682	gal/yr	0.744	lb/kgal	1.52
Maximum Permitted #2 Oil Combustion - Boilers 1 and 2	903	gal/hr	0.0080	lb/kgal	4.09
Maximum Permitted #2 Oil Combustion - Boiler 3	393,120	gal/yr	0.0080	lb/MMBtu	0.20
		HAP PTE Summation:[1]			***9.37***

[1] This is a worst case calculation based on maximum firing rates for each fuel. Boilers cannot simultaneously fire NG, No. 2 oil, and NO. 6 oil at maximum rates.

Ambient Air Quality Impact Analyses

As presented in the Modeling Memo in Appendix B, the applicant has demonstrated pre-construction compliance to DEQ's satisfaction that emissions from this project will not 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 for carcinogens (AACC) for toxic air pollutants (TAP). A summary of the Ambient Air Impact Analysis for TAP is provided in Appendix B.

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 Basic American Foods facility is located in Bingham County, which is designated as unclassifiable/attainment for $PM_{2.5}$, PM_{10}, SO_2, NO_X, CO, and Ozone. Reference to 40 CFR 81.313 for additional information.

Facility Classification

The AIRS/AFS facility classification codes are as follows:

For THAPs (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 HAPS (Total HAPs) 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.

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 10 REGULATED AIR POLLUTANT FACILITY CLASSIFICATION

Pollutant	Uncontrolled PTE (T/yr)	Permitted PTE (T/yr)	Major Source Thresholds (T/yr)	AIRS/AFS Classification
PM	>100	>100	**100**	A
PM_{10}	>100	>100	**100**	A
$PM_{2.5}$	>100	>100	**100**	A
SO_2	>100	>100	**100**	A
NO_X	>100	>100	**100**	A
CO	>100	>100	**100**	A
VOC	<100	<100	**100**	B
HAP (single)	<10	<10	**10**	B
HAP (total)	<25	<25	**25**	B
Pb	<100	<100	**100**	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 for installing a new production line. 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 Conditions in the current Tier I operating permit.

Particulate Matter – New Equipment Process Weight Limitations (IDAPA 58.01.01.701)

IDAPA 58.01.01.701 ..... Particulate Matter – New Equipment Process Weight Limitations

IDAPA 58.01.01.700 through 703 set PM emission limits for process equipment based on when the piece of equipment commenced operation and the piece of equipment's process weight (PW) in pounds per hour (lb/hr). IDAPA 58.01.01.701 and IDAPA 58.01.01.702 establish PM emission limits for equipment that commenced operation on or after October 1, 1979 and for equipment operating prior to October 1, 1979, respectively.

For equipment that commenced operation on or after October 1, 1979, the PM allowable emission rate (E) is based on one of the following equations:

IDAPA 58.01.01.701.01.a: If PW is < 9,250 lb/hr; $E = 0.045\ (PW)^{0.60}$

IDAPA 58.01.01.701.01.b: If PW is ≥ 9,250 lb/hr; $E = 1.10\ (PW)^{0.25}$

The proposed throughput of the new production line is 70,000 lb/day. The hourly process weight is calculated as follows:

PW= (70,000 lb/day) / (24 hr/day) = 2,917 lb/hr

Therefore, the allowable PM emission rate is calculated as:

$E = 0.045 \times PW^{0.60} = 0.045 \times (2{,}917)^{0.60} = 5.4$ lb/hr

As presented in Table 13 of Appendix A of this document, the estimated PM PTE for the new production line is less than 1 lb/hr. Therefore, compliance with the process weight rate requirement has been demonstrated.

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 $PM_{2.5}/PM_{10}$, SO_2, NO_X, and CO 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. The facility currently has a Tier I operating permit. Per IDAPA 58.01.01.209.05, the facility will have to apply to modify their Tier I permit to incorporate the requirements of this PTC.

PSD Classification (40 CFR 52.21)

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

The facility is classified as an existing major stationary source because the facility is a designated facility as defined in 40 CFR 52.21(b)(1)(i)(a) and because the estimated emissions of $PM_{2.5}/PM_{10}$, SO_2, NO_X, and CO have the potential to exceed major stationary source thresholds of 100 tons per year.

NSPS Applicability (40 CFR 60)

Refer to the facility's current Tier I operating permit for NSPS applicability determinations and discussions. This permitting action does not alter applicable NSPS requirements.

NESHAP Applicability (40 CFR 61)

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

MACT Applicability (40 CFR 63)

Refer to the facility's current Tier I operating permit for MACT applicability determinations and discussions. This permitting action does not alter applicable MACT requirements.

Permit Conditions Review

This section describes the permit conditions for this initial permit.

Permit condition 1.1 states the purpose of this permitting action.

Table 1.1 lists the regulated emissions units and their control. Though the information in the table is for informational purpose only, the information is used for the permitting analyses and is the basis for this permitting action.

Permit conditions 2.1 and 2.2 provide process description and the control of the new production line.

Permit condition 2.3 includes the emissions limits. Limits in lb/hr are the modeled short term rates used in the ambient impact analysis. Limits in T/yr are calculated by multiplying the modeled annual average rates in lb/hr with 8,760 hr/yr and 1 T/2000 lb. The lb/day limits for $PM_{2.5}$ and PM_{10} are calculated by multiplying the modeled short term rates with 24.

The modeled ambient impact is below significant impact level (SIL) at the production design rate of 70,000 lb/day and using Venturi scrubber to control particulate emissions. The impact levels are about 88% SIL for 24-hr $PM_{2.5}$, 96% SIL for annual $PM_{2.5}$, 27% SIL for 24-hr PM_{10}, 86% SIL for 1-hr NO_2, and 36% SIL for annual NOx. When the boilers burn No.6 fuel oil, the SO_2 impact are much higher than using natural gas or No. 2 fuel oil with the percentage of SIL as: 41% for 1-hr SO_2, 8% for 3-hr SO_2, 22% SIL for 24-hr SO_2, and 14% SIL for annual SO_2. It appears that SO_2 impact caused by the pre-dryer and dryer only is low.

Room air will be used as intake air for the pre-dryer and dryer; thus, the combustion products from the air make-up unit will exhaust through the pre-dryer and dryer stacks. Emissions from the air make-up unit are prorated to individual stacks based on the stack air flow rates.

The following are the emissions rates used in the permitting analysis.

Pre-dryer and Dryer Emission Rates

Source Description[(a)]	$PM_{2.5}$		PM_{10}		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	lb/hr	T/yr
Pre-dryer stack	0.216	0.95	0.233	1.02	0.013	0.058	0.289	1.14	1.48	5.59	0.10	0.37
Dryer stack	0.129	0.57	0.163	0.71	0.022	0.094	0.155	0.47				

(a) The combustion products from the air make-up unit will exhaust through the pre-dryer and dryer stacks. Emissions from the air make-up unit are prorated to individual stacks based on stack air flow rates.

Permit condition 2.4 is an opacity limit. The permittee will comply with the limit according to the current Tier I operating permit.

Permit Condition 2.5 limits the maximum steam usage for the new production line. 920 lb/hr is the increase steam usage from Boilers 1 and 2 due to the new production line. It was used in the permitting analysis, including emissions estimation, major modification test for PSD applicability determination, and modeling analysis.

Permit condition 2.6 states that only natural gas shall be burned in the pre-dryer, dryer, and air makeup unit.

Permit Condition 2.7

Permit Condition 2.7.1 limits the total finished product from production line C-8 to 70,000 lb/day as all analyses were based on this production rate and based on operating 24 hours per day and 365 days per year. Permit Condition 2.7.2 allows production rate change based on a stack test for each stack and new emissions factors approved by DEQ. This approach is requested by the applicant in the comments on the draft permit. PC 2.7.2 allows production rates being higher than the rate (70,000 lb/day) used in the analysis if the production line and/or control device are run more efficiently than they are described in the application and if the emissions stay below the permit limits. However, if the production rate increase is due to a physical change to the production line, then the applicant will need to look into the definition of "modification" in Air Rules and to see whether a permit or an exemption is needed. The permittee shall document the determination and follow IDAPA 58.01.01.200-228 as applicable.

Permit condition 2.8 specifies burners' guaranteed NOx concentrations for air make-up unit, pre-dryer, and dryer. These data are used in the emissions calculation and ambient impact analysis to keep the project NOx ambient

impact below SIL to avoid full modeling analysis. The project ambient impact for NOx is about 86% SIL for 1-hr NO_2.

Permit condition 2.9 specifies the scrubber's operating requirements. The standard language in PC 2.9 is taken from the internal guidance for Venturi scrubber. The facility has proposed to use EnviroCare MicroMist Scrubber that uses a multi-tube Venturi stage for wet scrubbing. 75% particulate control efficiency is guaranteed when the pressure drop is 17 inches of water or greater at MicroMist venturi stage and when the inlet water flow is 178 gpm or greater. As requested by the applicant in the facility's comments on the draft permit, PC 2.9 now allows the facility to develop the operating parameters ranges based on performance testing required in the permit.

Permit condition 2.10 is the monitoring requirement for the steam usage limit.

Permit condition 2.11 specifies $PM_{2.5}$ and PM_{10} compliance demonstration method that is proposed in the comments on the draft permit. Refer to Appendix C of the SOB for more details.

Permit condition 2.12 requires the permittee to maintain documentation showing that the to-be-installed air make-up unit, pre-dryer, and dryer meet the low NOx burner requirement. Manufacturer or vendor technical specifications for installed equipment are acceptable documentation. However, having the documentation does not preclude an inspector to check the plates of the equipment to determine compliance.

Permit condition 2.13 is standard monitoring language taken from DEQ's internal guidance for Venturi scrubber.

Permit Condition 2.14 requires the applicant to perform initial source test to demonstrate compliance with NOx, $PM_{2.5}$, and PM_{10} emissions limits. Because the SO_2 impact is well below the SIL (2% to 41%), source testing for SO_2 is not required. Permit Condition 2.14 uses the standard source testing language from DEQ's internal guidance and has also added the facility's comments on the draft permit. Refer to Appendix C of the SOB for more details.

Permit condition 2.15 requires the applicant to perform subsequent performance test for $PM_{2.5}$. The permit does not require PM_{10} subsequent source test because the PM_{10} ambient impact is 26% of the SIL and because it is assumed that as long as the applicant meets the $PM_{2.5}$ limit, the applicant will meet the PM_{10} limit. The permit does not require NOx subsequent source test because once the NOx compliance is verified in the initial test, it is assumed that the correct low NOx burners are installed.

Permit Condition 3.1

The duty to comply general compliance provision requires that the permittee comply with all of the permit terms and conditions pursuant to Idaho Code §39-101.

Permit Condition 3.2

The maintenance and operation general compliance provision requires that the permittee maintain and operate all treatment and control facilities at the facility in accordance with IDAPA 58.01.01.211.

Permit Condition 3.3

The obligation to comply general compliance provision 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.

Permit Condition 3.4

The inspection and entry provision requires that the permittee allow DEQ inspection and entry pursuant to Idaho Code §39-108.

Permit Condition 3.5

The permit expiration construction and operation provision 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.

Permit Condition 3.6

The 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.

Permit Condition 3.7

The performance testing notification of intent provision 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.

Permit Condition 3.8

The performance test protocol provision 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.

Permit Condition 3.9

The performance test report provision requires that the permittee report any performance test results to DEQ within 60 days of completion, in accordance with IDAPA 58.01.01.157.04-05.

Permit Condition 3.10

The monitoring and recordkeeping provision requires that the permittee maintain sufficient records to ensure compliance with permit conditions, in accordance with IDAPA 58.01.01.211.

Permit Condition 3.11

The excess emissions provision requires that the permittee follow the procedures required for excess emissions events, in accordance with IDAPA 58.01.01.130-136.

Permit Condition 3.12

The certification provision requires that a responsible official certify all documents submitted to DEQ, in accordance with IDAPA 58.01.01.123.

Permit Condition 3.13

The false statement provision requires that no person make false statements, representations, or certifications, in accordance with IDAPA 58.01.01.125.

Permit Condition 3.14

The tampering provision requires that no person render inaccurate any required monitoring device or method, in accordance with IDAPA 58.01.01.126.

Permit Condition 3.15

The transferability provision specifies that this permit to construct is transferable, in accordance with the procedures of IDAPA 58.01.01.209.06.

Permit Condition 3.16

The severability provision 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. During this time, there were no comments on the application and 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

Proposed Minor Modification to an Existing Major Facility - Major Modification Test

Table 1 PROJECTED ACTUAL EMISSIONS or PTE FOR PROJECTED ACTUAL EMISSIONS

Emissions Unit	CO	NOx	SO2	PM10	PM2.5	VOC	Pb
	T/yr	T/yr	T/yr	T/yr	T/yr	T/yr	T/yr
Point Sources							
Dehydration Activities	0.00	0.00	0.15	1.73	1.51		
Combined Fuel Combustion	5.59	1.61	0.00	0.00	0.00	0.37	3.33E-05
Additional Boiler Emissions	0.41	1.78	2.25	0.09	0.09	0.03	4.89E-05
{Note: all quantifiable fugitive emissions, regardless of source category, are required to be included} Fugitive Sources							
no quantifiiable emissions	0	0	0	0	0	0	0
Facility Totals							
Total, Projected Actual Emissions	6.00	3.39	2.41	1.82	1.60	0.39	8.22E-05

Table 2 BASELINE ACTUAL EMISSIONS

Emissions Unit	CO	NOx	SO2	PM10	PM2.5	VOC	Pb
	T/yr	T/yr	T/yr	T/yr	T/yr	T/yr	T/yr
Point Sources							
Predryer	0	0	0	0	0	0	0
AMU	0	0	0	0	0	0	0
Combined Fuel Combustion	0	0	0	0	0	0	0
{Note: all quantifiable fugitive emissions, regardless of source category, are required to be included } Fugitive Sources							
no quantifiiable emissions	0	0	0	0	0	0	0
Facility Totals							
Total, Baseline Actual Emissions	0	0	0	0	0	0	0

Table 3 COMPARISON OF THE PROJECT EMISSIONS INCREASE TO THE SIGNIFICANT EMISSIONS RATE THRESHOLDS

Emissions Unit	CO	NOx	SO2	PM10	PM2.5	VOC	Pb
	T/yr	T/yr	T/yr	T/yr	T/yr	T/yr	T/yr
Project Emissions Increase	6.00	3.39	2.41	1.82	1.60	0.39	8.22E-05
PSD Significance Emission Rate (SER) *See 40 CFR 52.21(b)(23)*	100	40	40	15	10	40	0.6
Does the Project Emissions Increase Exceed the Significant Emission Rate Threshold?	No	No	No	No	No	No	No

Table 1

Operating Information for Newly Installed Equipment

Emissions Unit	Operating Status	Type of Emission Unit	Materials Processed	Operating Rate		Fuel Combustion	
				lb/day	lb/yr	Fuel Type	Heat Rate, MMBTU/hr
Pre-dryer	New	vegetable dryer	Fresh and reformulated potatoes	70,000	25,550,000	natural gas	8
Dryer	New	vegetable dryer	Fresh and reformulated potatoes	70,000	25,550,000	natural gas	5
Air makeup	New	Space heater	NA	NA	NA	natural gas	5

Table 2			
Criteria Air Pollutant Emission Factors - NG Burners			
Pollutant	Emission Factor	Units	Emission Factor Basis
CO	0.0824	lbs CO/MMBtu	AP-42, Table 1.4-1. Converted to lb/MMBtu assuming 1020 Btu/scf.
NOx	0.0304	lbs NOx/MMBtu	Based on 25 ppmv at 3% oxygen.
	0.0243	lbs NOx/MMBtu	Based on 20 ppmv at 3% oxygen.
	0.0121	lbs NOx/MMBtu	Based on 10 ppmv at 3% oxygen.
SO2	Included in process emission factors*		
PM10			
PM2.5			
VOC	0.0054	lbs VOC/ MMBtu	AP-42, Table 1.4-2. Converted to lb/MMBtu assuming 1020 Btu/scf.
Pb	4.9E-07	lbs Pb/ MMBtu	AP-42, Table 1.4-4. Converted to lb/MMBtu assuming 1020 Btu/scf.

Notes:

* Emission factors for particulates and SO2 are based on process stack testing during which fuels were being combusted. Accordingly, emissions from particulates and SO2 from NG combustion are accounted for in the process emission factors for these pollutants. See emission inventory tables in the Statement of Basis for Tier I Operating Permit No. T1-2012-0030.

NOX CONVERSION, PPMVD TO LB/MMBTU - BASED ON 10 PPMVD NOX

Parameter	Value	Units	Reference/Discussion
Fd, dry exhaust gas factor	8710	dscf/MMBtu	From Table 19-2, EPA Test Method 19
Fd adjusted to 3% O2	10170	dscf/MMBtu @ 3% O2	=Fd*(20.9/(20.9-3))
FW, formula weight	46	-	NOx as NO2
PPM, stack gas concentration	10	ppmvd NOx @3% O2	
E, emissions	0.00000119	lb/dscf @ 10 ppmvd	=PPM*FW/(385.1*10^6)
EFh, heat rate emission factor	0.012	lb/MMBtu @ ppmvd	=E*Fa

Table 3
Toxic and Hazardous Air Pollutant Emission Factors - NG Burners

Air Pollutant	lb/MMBTU*	Emission Factor Reference	EPA Hazardous Air Pollutant?	Idaho Toxic Air Pollutant?
EPA Total HAPs	1.85E-03	Summation of individual EPA HAP components	Yes	No
Polycyclic Organic Matter (ID POM Summation)	1.12E-08	Summation of individual ID POM components	No	Yes
Acenaphthene	1.76E-09	AP-42, Table 1.4-3	Yes	Yes (General PAH)
Acenaphthylene	1.76E-09	AP-42, Table 1.4-3	Yes	Yes (General PAH)
Anthracene	2.35E-09	AP-42, Table 1.4-3	Yes	Yes (General PAH)
Benz(a)anthracene	1.76E-09	AP-42, Table 1.4-3	Yes	Yes (7-PAH Group)
Benzene	2.06E-06	AP-42, Table 1.4-3	Yes	Yes
Benzo(a)pyrene	1.18E-09	AP-42, Table 1.4-3	Yes	Yes (7-PAH Group)
Benzo(b)fluoranthene	1.76E-09	AP-42, Table 1.4-3	Yes	Yes (7-PAH Group)
Benzo(g,h,i)perylene	1.18E-09	AP-42, Table 1.4-3	Yes	Yes (General PAH)
Benzo(k)fluoroanthene	1.76E-09	AP-42, Table 1.4-3	Yes	Yes (7-PAH Group)
Chrysene	1.76E-09	AP-42, Table 1.4-3	Yes	Yes (7-PAH Group)
Dibenzo(a,h)anthracene	1.18E-09	AP-42, Table 1.4-3	Yes	Yes (7-PAH Group)
Dichlorobenzene (mixed isomers)	1.18E-06	AP-42, Table 1.4-3	Yes	Yes
7,12-Dimethylbenz(a)anthracene	1.57E-08	AP-42, Table 1.4-3	Yes	Yes (General PAH)
Fluoranthene	2.94E-09	AP-42, Table 1.4-3	Yes	Yes (General PAH)
Fluorene	2.75E-09	AP-42, Table 1.4-3	Yes	Yes (General PAH)
Formaldehyde	7.35E-05	AP-42, Table 1.4-3	Yes	Yes
Hexane	1.76E-03	AP-42, Table 1.4-3	Yes	Yes
Indeno(1,2,3-cd)pyrene	1.76E-09	AP-42, Table 1.4-3	Yes	Yes (7-PAH Group)
2-Methylnaphthalene	2.35E-08	AP-42, Table 1.4-3	Yes	Yes (General PAH)
3-Methylchloroanthene	1.76E-09	AP-42, Table 1.4-3	Yes	Yes
Naphthalene	5.98E-07	AP-42, Table 1.4-3	Yes	Yes
Pentane	2.55E-03	AP-42, Table 1.4-3	No	Yes
Phenanthrene	1.67E-08	AP-42, Table 1.4-3	Yes	Yes (General PAH)
Pyrene	4.90E-09	AP-42, Table 1.4-3	Yes	Yes (General PAH)
Toluene	3.33E-06	AP-42, Table 1.4-3	Yes	Yes
Arsenic	1.96E-07	AP-42, Table 1.4-4	Yes	Yes
Beryllium	1.18E-08	AP-42, Table 1.4-4	Yes	Yes
Cadmium	1.08E-06	AP-42, Table 1.4-4	Yes	Yes
Chromium	1.37E-06	AP-42, Table 1.4-4	Yes	Yes
Chromium (VI)	6.86E-08	AP-42, Table 1.4-4	No	Yes
Cobalt	8.24E-08	AP-42, Table 1.4-4	Yes	Yes
Manganese	3.73E-07	AP-42, Table 1.4-4	Yes	Yes
Mercury	2.55E-07	AP-42, Table 1.4-4	Yes	Yes
Nickel	2.06E-06	AP-42, Table 1.4-4	Yes	Yes
Selenium	2.35E-08	AP-42, Table 1.4-4	Yes	Yes

*Based on 1020 BTU/scf natural gas heat content

Table 4. Boiler Operating Data Under Maximum Allowable Conditions

	Oil Fuel Rate, gal/hr		NG Heat Rate, MMBtu/hr.	Steam Rate, lb/hr		
	#6 Oil	#2 Oil		#6 Oil	#2 Oil	NG
Boiler 1	239	390	55.2	30,000	45,500	45,500
Boiler 2	402	513	73.5	50,000	60,000	60,000

From Table 2 of April 20, 2005 letter from Bruce Wright, Basic American Foods, to Ken Hanna, Idaho DEQ, regarding "Revised Emission Estimates for Basic American Foods Application for Permit to Construct – Refiring of Boilers 6 and 8 (February 2005)". See attachment included with March 23, 2017 email from Steve Brockett, BAF, to Shawnee Chen, DEQ, "RE: BLACKFOOT FACILITY OF BASIC AMERICAN FOODS - P-2017.0011 PROJ 61851".

Table 5. Boiler 1 and 2 Emission Factors

Fuel	Pollutant	Emission Factor Value	Units	Basis
#6 Oil	CO	5	lb/kgal	AP-42, Table 1.3-1 for boilers <100 MMBtuh.
	NOx	55	lb/kgal	AP-42, Table 1.3-1 for boilers <100 MMBtuh.
	SO2 + SO3	69.6	lb/kgal	AP-42, Table 1.3-1 for boilers <100 MMBtuh. Fuel sulfur = 1.75%. Scrubber control efficiency = 75%
	Filterable PM10	1.17	lb/kgal	AP-42, Figure 1.3-1 (scrubber curve). PM10 = 0.06*A. A = 1.12(S) + 0.37, where S is wt% S in oil.
	Filterable PM2.5	1.13	lb/kgal	AP-42, Figure 1.3-1 (scrubber curve). PM2.5 = 0.058*A. A = 1.12(S) + 0.37, where S is wt% S in oil.
	Condensable PM	1.5	lb/kgal	AP-42, Table 1.3-2
	PM10	2.67	lb/kgal	Sum of filterable PM10 and condensable PM
	Direct PM2.5	2.63	lb/kgal	Sum of filterable PM2.5 and condensable PM
	VOC	0.28	lb/kgal	AP-42, Table 1.3-3. NMTOC for #6 oil-fired industrial boilers
	Pb	0.0015	lb/kgal	AP-42, Table 1.3-11
	CO2e	24,400	lb/kgal	AP-42, Table 1.3-12 for CO2. Contribution from other GHGs deemed trivial.
#2 Oil	CO	5	lb/kgal	AP-42, Table 1.3-1 for boilers <100 MMBtuh.
	NOx	20	lb/kgal	AP-42, Table 1.3-1 for boilers <100 MMBtuh.
	SO2 + SO3	18.0	lb/kgal	AP-42, Table 1.3-1 for boilers <100 MMBtuh. Fuel sulfur = 0.5%. Scrubber control efficiency = 75%
	Filterable PM10	0.50	lb/kgal	AP-42, Table 1.3-6. Scrubber efficiency = 50%.
	Filterable PM2.5	0.50	lb/kgal	100% of controlled filterable PM10 assumed to be filterable PM2.5.
	Condensable PM	1.3	lb/kgal	AP-42, Table 1.3-2
	PM10	1.80	lb/kgal	Sum of filterable PM10 and condensable PM
	Direct PM2.5	1.80	lb/kgal	Sum of filterable PM2.5 and condensable PM
	VOC	0.20	lb/kgal	AP-42, Table 1.3-3. NMTOC for #6 oil-fired industrial boilers
	Pb	0.0012	lb/kgal	AP-42, Table 1.3-10. Converted to lb/kgal based on 0.1368 MMBtu/kgal
	CO2e	22,300	lb/kgal	AP-42, Table 1.3-12 for CO2. Contribution from other GHGs deemed trivial.
NG	CO	0.0824	lb/MMBtu	AP-42, Table 1.4-1. Converted to lb/MMbtu based on 1020 MMBtu/MMscf NG.
	NOx - Boiler 1	0.098	lb/MMBtu	AP-42, Table 1.4-1. Converted to lb/MMbtu based on 1020 MMBtu/MMscf NG.
	NOx - Boiler 2	0.055	lb/MMBtu	See note below.
	SO2	0.00588	lb/MMBtu	AP-42, Table 1.4-2. Converted to lb/MMbtu based on 1020 MMBtu/MMscf NG.
	PM10	0.00745	lb/MMBtu	AP-42, Table 1.4-1. Converted to lb/MMbtu based on 1020 MMBtu/MMscf NG. All PM assumed to lbbe PM10.
	PM2.5	0.00745	lb/MMBtu	AP-42, Table 1.4-1. Converted to lb/MMbtu based on 1020 MMBtu/MMscf NG. All PM assumed to lbbe PM2.5.
	VOC	0.00539	lb/MMBtu	AP-42, Table 1.4-1. Converted to lb/MMbtu based on 1020 MMBtu/MMscf NG.
	Pb	4.90E-07	lb/MMBtu	AP-42, Table 1.4-2. Converted to lb/MMbtu based on 1020 MMBtu/MMscf NG.
	CO2e	118	lb/MMBtu	AP-42, Table 1.4-2 for CO2e. Other GHGs negligible. Converted to lb/MMbtu based on 1020 MMBtu/MMscf NG.

Note:

From Table 6 of April 20, 2005 letter from Bruce Wright, Basic American Foods, to Ken Hanna, Idaho DEQ, regarding "Revised Emission Estimates for Basic American Foods Application for Permit to Construct – Refiring of Boilers 6 and 8 (February 2005)". See attachment included with March 23, 2017 email from Steve Brockett, BAF, to Shawnee Chen, DEQ, "RE: BLACKFOOT FACILITY OF BASIC AMERICAN FOODS - P-2017.0011 PROJ 61851". Note that Boiler 6 has been renumbered to Boiler 2.

Table 6. Steam-Based Emission Factors - Boilers 1 and 2

Fuel Option	Pollutant	Emission Factor Value	Emission Factor Units	Emission Rate, lb/hr Boiler 1	Emission Rate, lb/hr Boiler 2	Steam-Based Emissions, lb/klb steam Boiler 1	Steam-Based Emissions, lb/klb steam Boiler 2
		Operating Rate:		239 gal/hr	402 gal/hr	30,000 lb steam/hr	50,000 lb steam/hr
#6 Oil	CO	5	lb/kgal	1.20	2.01	0.040	0.040
	NOx	55	lb/kgal	13.15	22.11	0.438	0.442
	SO2 + SO3	69.6	lb/kgal	16.63	27.96	0.554	0.559
	PM10	2.67	lb/kgal	0.64	1.07	0.021	0.021
	Direct PM2.5	2.63	lb/kgal	0.63	1.06	0.021	0.021
	VOC	0.28	lb/kgal	0.07	0.11	0.002	0.002
	Pb	1.51E-03	lb/kgal	3.61E-04	6.07E-04	1.20E-05	1.21E-05
	CO2e	24,400	lb/kgal	5,832	9,809	194.4	196.2
	Fuel Rate	-	gal/hr	390 gal/hr	513 gal/hr	45,500 lb steam/hr	60,000 lb steam/hr
#2 Oil	CO	5	lb/kgal	1.95	2.57	0.043	0.043
	NOx	20	lb/kgal	7.80	10.26	0.171	0.171
	SO2 + SO3	18.0	lb/kgal	7.02	9.23	0.154	0.154
	PM10	1.80	lb/kgal	0.70	0.92	0.015	0.015
	Direct PM2.5	1.80	lb/kgal	0.70	0.92	0.015	0.015
	VOC	0.20	lb/kgal	0.08	0.10	0.002	0.002
	Pb	1.23E-03	lb/kgal	4.80E-04	6.32E-04	1.06E-05	1.05E-05
	CO2e	22,300	lb/kgal	8,697	11,440	191.1	190.7
	Heat Rate	-	MMBtu/hr	55.2 MMBtuh	73.5 MMBtuh	45,500 lb steam/hr	60,000 lb steam/hr
NG	CO	0.0824	lb/kgal	4.55	6.05	0.100	0.101
	NOx - Boiler 1	0.098	lb/kgal	5.41		0.119	
	NOx - Boiler 2	0.055	lb/kgal		4.04		0.067
	SO2	0.00588	lb/kgal	0.32	0.43	0.007	0.007
	PM10	0.00745	lb/MMBtu	0.41	0.55	0.009	0.009
	PM2.5	0.00745	lb/MMBtu	0.41	0.55	0.009	0.009
	VOC	0.00539	lb/MMBtu	0.30	0.40	0.007	0.007
	Pb	4.90E-07	lb/MMBtu	2.71E-05	3.60E-05	5.95E-07	6.00E-07
	CO2e	118	lb/MMBtu	6,494	8,647	142.7	144.1

Table 7

Criteria Air Pollutant Emission Factors - Dehydration Activities

Pollutant	Emission Factor	Units	Emission Factor Basis
SO2	0.012	lb SO2/1000 lbs production	Based on measured emissions from stacks HEB and HNL at Blackfoot Plant. Emission factor scaled reflect the amouint of sulfite used on the product in the new production line. See discussion in Section 4 of PTC Application.
PM10	0.304	lb PM10/1000 lbs production	Souce testing companion production line at Blackfoot plant. See discussion in Section 4 of PTC Application
PM2.5	0.251	lb PM2.5/1000 lbs production	50% of filterable PM10 assumed to be PM2.5. See discussion in Section 4 of PTC Application

Table 8. PM Emission Factors for Each Dryer

Pollutant	Emissions Unit	Cumulative Drying Completion	Process PM10 Allocation		Uncontrolled Emissions, lbPM10/klb		
			Filterable	Condensable	Filterable*	Condensable†	Total
PM10	Pre-Dryer	29%	11.0%	34.3%	0.012	0.068	0.080
	Dryer	100%	89.0%	65.7%	0.093	0.131	0.224
	Total		*100.0%*	*100.0%*	*0.105*	*0.199*	*0.304*
PM2.5	Pre-Dryer		-	-	0.006	0.068	0.074
	Dryer		-	-	0.047	0.131	0.177
	Total		-	-	*0.052*	*0.199*	*0.251*

* Based on overall process PM10 emission factor of 0.1047 lb filterable PM10 per klb product. Filterable PM2.5 = 50% of filterable PM10. See discussion in Section 4 of PTC application.

† Based on overall process emission factor of 0.1989 lb condensable PM10 per klb product. See discussion in Section 4 of PTC application.

Table 9 - Allocation of Process SO2 Emissions to Individual Stacks

Stack	Stack Q*, scfm	Process SO2 Allocation	Uncontrolled SO2 Emission Factor, lb/klb
Predryer	15,898	38%	0.0045
Dryer	25,901	62%	0.0074
Total:		100%	0.0119

Notes:
Stack scfm air flow rates from process design parameters.

Table 10

Criteria Pollutant Emissions From Process Fuel Combustion

Pollutant	Emissions Unit	Heat Rate, MMBtuh	Emission Factor, lb/MMBtu	Emissions	
				lb/hr	tpy
CO	Fuel combustion in dryers	13	0.082	1.071	4.69
	Air Makeup Unit	5	0.082	0.412	0.90
			Total CO:	*1.482*	*5.59*
NOx	Predryer (25 ppm NOx)	6	0.0304	0.182	0.80
	Predryer (20 ppm NOx)	2	0.0243	0.049	0.21
	Dryer (10 ppm NOx)	5	0.0121	0.061	0.27
	Air Makeup unit (25 ppm NOx)	5	0.0304	0.152	0.33
			Total NOx:	*0.443*	*1.61*
SO2	All process fuel combustion	18	Included in process emissions calculations.		
PM10	All process fuel combustion	18			
PM2.5	All process fuel combustion	18			
VOC	Fuel combustion in dryers	13	0.005	0.070	0.31
	Air Makeup Unit	5	0.005	0.027	0.06
			Total VOC:	*0.097*	*0.37*
Pb	Fuel combustion in dryers	13	4.90E-07	6.37E-06	2.79E-05
	Air Makeup Unit	5	4.90E-07	2.45E-06	5.37E-06
			Total Pb:	*8.82E-06*	*3.33E-05*

Table 11. Increase in Criteria Pollutant Emissions Associated with Increased Steam Demand for 70,000 lb/day production

Pollutant	Steam Emission Factor, lb/klb steam						Increase in Emissions for 920 lb/hr Added Steam Demand, lb/hr						Maximum Emissions Increase for any Boiling Fuel Option	
	Boiler 1			Boiler 2			Boiler 1			Boiler 2				
	#6 Oil	#2 Oil	NG	#6 Oil	#2 Oil	NG	#6 Oil	#2 Oil	NG	#6 Oil	#2 Oil	NG	lb/hr	ton/yr
CO	0.040	0.043	0.100	0.040	0.043	0.101	0.037	0.039	0.092	0.037	0.039	0.093	0.09	0.41
NOx	0.438	0.171	0.119	0.442	0.171	0.067	0.403	0.158	0.109	0.407	0.157	0.062	0.41	1.78
SO2 + SO3	0.554	0.154	0.007	0.559	0.154	0.007	0.510	0.142	0.007	0.515	0.142	0.007	0.51	2.25
PM10	0.021	0.015	0.009	0.021	0.015	0.009	0.020	0.014	0.008	0.020	0.014	0.008	0.02	0.09
Direct PM2.5	0.021	0.015	0.009	0.021	0.015	0.009	0.019	0.014	0.008	0.019	0.014	0.008	0.02	0.09
VOC	0.002	0.002	0.007	0.002	0.002	0.007	0.002	0.002	0.006	0.002	0.002	0.006	0.01	0.03
Pb	1.20E-05	1.06E-05	5.95E-07	1.21E-05	1.05E-05	6.00E-07	1.11E-05	9.71E-06	5.47E-07	1.12E-05	9.68E-06	5.52E-07	1.12E-05	4.89E-05

Table 12. Dehydration Activity Emissions @ 70,000 lb/day

Pollutant	Emissions Unit	Emission Factor	Uncontrolled Emissions		Control Efficiency	Controlled	
		lb/klb	lb/hr	ton/yr		lb/hr	ton/yr
SO2	Pre-Dryer	0.0045	0.013	0.06	0%	0.013	0.058
	Dryer	0.0074	0.022	0.09	0%	0.022	0.094
	Total	*0.0119*	*0.035*	*0.15*		*0.035*	*0.15*
PM10	Pre-Dryer	0.080	0.233	1.02	0%	0.233	1.02
	Dryer	0.224	0.653	2.86	75%	0.163	0.71
	Total	*0.304*	*0.886*	*3.88*		*0.396*	*1.73*
PM2.5	Pre-Dryer	0.074	0.216	0.95	0%	0.216	0.95
	Dryer	0.177	0.517	2.26	75%	0.129	0.57
	Total	*0.251*	*0.733*	*3.21*		*0.345*	*1.51*

Table 13

Criteria Pollutant Emissions Summary

	Process Combustion		Added Steam Generation		Dehydration Activities		Total Increase	
	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
CO	1.48	5.59	0.093	0.41	-	-	1.58	6.00
NOx	0.44	1.61	0.407	1.78	-	-	0.85	3.39
SO2	-	-	0.515	2.25	0.035	0.15	0.55	2.41
PM10	-	-	0.020	0.09	0.396	1.735	0.42	1.82
PM2.5	-	-	0.019	0.09	0.345	1.51	0.36	1.60
VOC	0.10	0.37	0.006	0.03	-	-	0.10	0.39
Pb	8.82E-06	3.33E-05	1.12E-05	4.89E-05	-	-	2.00E-05	8.22E-05

parameter	value	units	Discussion/basis/reference
Process filterable PM10 emission factor	0.1047	lb/1000 bls	from 2011 stack testing emission factor report
Process filterable PM2.5 emission factor	0.0524	lb/1000 bls	50% of filterable PM10. Based on engineering judgement and cascade impactor analysis of granules secondary dryer exhaust
Process condensible PM emission factor	0.1989		

Process PM Emissions

testing to be applied to other production lines with similar dryer trains. The fitted curve for filterable PM-10 emissions is a simple polynomial curve with a 1.8 exponent:

$$Filt_{cum} = \%D^{1.8}$$

where: $Filt_{cum}$ = cumulative percentage of filterable PM-10 emitted
$\%D$ = percent completion of drying

The fitted curve for CPM emissions is a simple linear relationship, with the constraint that all of the CPM being emitted when the drying process is 85% complete:

$$CPM_{cum} = 1.17 * \%D \; for \; \%D \leq 85\%$$

$$CPM_{cum} = 100\% \; for \; \%D > 85\%$$

where: CPM_{cum} = cumulative percentage of CPM emitted
$\%D$ = percent completion of drying

These equations will be used to propose revisions to emission factors for other production lines and stacks.

Process SO2 Emission Factor	0.0119	lb/Mlb	From mesurement of SO2 emissions on HEB/HNL production line - 0.119 lb/Mlb. Sulfite addition on new production line is 10% of sulfite addition on HEB/HNL line.

Burner design firing rates		
Predryer A stage	6	MMBtuh
Predryer B stage	2	MMBtuh
Dryer	5	MMBtuh
air makeup unit	5	MMBtuh

Toxic Air Pollutant Emissions Inventory

Table 1. PRE- AND POST PROJECT NON-CARCINOGENIC TAP EMISSIONS SUMMARY POTENTIAL TO EMIT						
	24-Hour Average Emissions Rate, lb/hr			Non-Carcinogen Screening Emissions Level, lb/hr*	Screening Level Comparison	
Pollutant	Pre-Project	Post-Project	Net Change		Exceeds Level? (Y/N)	Percent of Screening Level
Dichlorobenzene (mixed isomers)	0.00E+00	2.12E-05	2.12E-05	2.00E+01	No	0.0%
Hexane	0.00E+00	3.18E-02	3.18E-02	1.20E+01	No	0.3%
Naphthalene	0.00E+00	1.08E-05	1.08E-05	3.33E+00	No	0.0%
Pentane	0.00E+00	4.59E-02	4.59E-02	1.18E+02	No	0.0%
Toluene	0.00E+00	6.00E-05	6.00E-05	2.50E+01	No	0.0%
Chromium	0.00E+00	2.47E-05	2.47E-05	3.30E-02	No	0.1%
Cobalt	0.00E+00	1.48E-06	1.48E-06	3.30E-03	No	0.0%
Manganese	0.00E+00	6.71E-06	6.71E-06	3.33E-01	No	0.0%
Selenium	0.00E+00	4.23E-07	4.23E-07	1.30E-02	No	0.0%

Table 2. PRE- AND POST PROJECT CARCINOGENIC TAP EMISSIONS SUMMARY POTENTIAL TO EMIT						
	Annual Average Emissions Rate, lb/hr			Carcinogen Screening Emissions Level, lb/hr*	Screening Level Comparison	
Pollutant	Pre-Project	Post-Project	Net Change		Exceeds Level? (Y/N)	Percent of Screening Level
Polycyclic Organic Matter (ID POM Summation)	0.00E+00	2.01E-07	2.01E-07	2.00E-06	No	10.1%
Acenaphthene	0.00E+00	3.18E-08	3.18E-08	9.10E-05	No	0.0%
Acenaphthylene	0.00E+00	3.18E-08	3.18E-08	9.10E-05	No	0.0%
Anthracene	0.00E+00	4.24E-08	4.24E-08	9.10E-05	No	0.0%
Benz(a)anthracene	0.00E+00	3.18E-08	3.18E-08	NA (ID POM Summation)		
Benzene	0.00E+00	3.71E-05	3.71E-05	8.00E-04		
Benzo(a)pyrene	0.00E+00	2.12E-08	2.12E-08	NA (ID POM Summation)		
Benzo(b)fluoranthene	0.00E+00	3.18E-08	3.18E-08	NA (ID POM Summation)		
Benzo(g,h,i)perylene	0.00E+00	2.12E-08	2.12E-08	9.10E-05	No	0.0%
Benzo(k)fluoroanthene	0.00E+00	3.18E-08	3.18E-08	NA (ID POM Summation)		
Chrysene	0.00E+00	3.18E-08	3.18E-08	NA (ID POM Summation)		
Dibenzo(a,h)anthracene	0.00E+00	2.12E-08	2.12E-08	NA (ID POM Summation)		
7,12-Dimethylbenz(a)anthracene	0.00E+00	2.82E-07	2.82E-07	9.10E-05	No	0.3%
Fluoranthene	0.00E+00	5.29E-08	5.29E-08	9.10E-05	No	0.1%
Fluorene	0.00E+00	4.94E-08	4.94E-08	9.10E-05	No	0.1%
Formaldehyde	0.00E+00	1.32E-03	1.32E-03	5.10E-04	Yes	259.5%
Indeno(1,2,3-cd)pyrene	0.00E+00	3.18E-08	3.18E-08	NA (ID POM Summation)		
2-Methylnaphthalene	0.00E+00	4.24E-07	4.24E-07	9.10E-05	No	0.5%
3-Methylchloroanthene	0.00E+00	3.18E-08	3.18E-08	9.10E-05	No	0.0%
Phenanthrene	0.00E+00	3.00E-07	3.00E-07	9.10E-05	No	0.3%
Pyrene	0.00E+00	8.82E-08	8.82E-08	9.10E-05	No	0.1%
Arsenic	0.00E+00	3.53E-06	3.53E-06	1.50E-06	Yes	235.2%
Beryllium	0.00E+00	2.12E-07	2.12E-07	2.80E-05	No	0.8%
Cadmium	0.00E+00	1.94E-05	1.94E-05	3.70E-06	Yes	525.4%
Chromium (VI)	0.00E+00	1.23E-06	1.23E-06	5.60E-07	Yes	220.5%
Nickel	0.00E+00	3.71E-05	3.71E-05	2.70E-05	Yes	137.3%

* per IDAPA 58.01.01, §585-586.

Operating Information for Newly Installed Equipment

Emissions Unit	Operating Status	Fuel Type	Heat Rate, MMBTU/hr	
			Maximum Day	Annual*
Pre-dryer	New	natural gas	8	8
Dryer	New	natural gas	5	5
Air makeup	New	natural gas	5	2.5
		Total:	18	15.5

* On an annual basis air makeup units operate for no more than 50% of capacity. See discussion of emission inventory in Section 5.10 of the Statement of Basis for Tier I Operating Permit No. T1-2012-0030.

Toxic and Hazardous Air Pollutant Emission Factors - NG Burners*

Air Pollutant	lb/MMBTU	Emission Factor Reference	EPA Hazardous Air Pollutant?	Idaho Toxic Air Pollutant?
EPA Total HAPs	1.85E-03	Summation of individual EPA HAP components	Yes	No
Polycyclic Organic Matter (ID POM Summation)	1.12E-08	Summation of individual ID POM components	No	Yes
Acenaphthene	1.76E-09	AP-42, Table 1.4-3	Yes	Yes (General PAH)
Acenaphthylene	1.76E-09	AP-42, Table 1.4-3	Yes	Yes (General PAH)
Anthracene	2.35E-09	AP-42, Table 1.4-3	Yes	Yes (General PAH)
Benz(a)anthracene	1.76E-09	AP-42, Table 1.4-3	Yes	Yes (7-PAH Group)
Benzene	2.06E-06	AP-42, Table 1.4-3	Yes	Yes
Benzo(a)pyrene	1.18E-09	AP-42, Table 1.4-3	Yes	Yes (7-PAH Group)
Benzo(b)fluoranthene	1.76E-09	AP-42, Table 1.4-3	Yes	Yes (7-PAH Group)
Benzo(g,h,i)perylene	1.18E-09	AP-42, Table 1.4-3	Yes	Yes (General PAH)
Benzo(k)fluoroanthene	1.76E-09	AP-42, Table 1.4-3	Yes	Yes (7-PAH Group)
Chrysene	1.76E-09	AP-42, Table 1.4-3	Yes	Yes (7-PAH Group)
Dibenzo(a,h)anthracene	1.18E-09	AP-42, Table 1.4-3	Yes	Yes (7-PAH Group)
Dichlorobenzene (mixed isomers)	1.18E-06	AP-42, Table 1.4-3	Yes	Yes
7,12-Dimethylbenz(a)anthracene	1.57E-08	AP-42, Table 1.4-3	Yes	Yes (General PAH)
Fluoranthene	2.94E-09	AP-42, Table 1.4-3	Yes	Yes (General PAH)
Fluorene	2.75E-09	AP-42, Table 1.4-3	Yes	Yes (General PAH)
Formaldehyde	7.35E-05	AP-42, Table 1.4-3	Yes	Yes
Hexane	1.76E-03	AP-42, Table 1.4-3	Yes	Yes
Indeno(1,2,3-cd)pyrene	1.76E-09	AP-42, Table 1.4-3	Yes	Yes (7-PAH Group)
2-Methylnaphthalene	2.35E-08	AP-42, Table 1.4-3	Yes	Yes (General PAH)
3-Methylchloroanthene	1.76E-09	AP-42, Table 1.4-3	Yes	Yes
Naphthalene	5.98E-07	AP-42, Table 1.4-3	Yes	Yes
Pentane	2.55E-03	AP-42, Table 1.4-3	No	Yes
Phenanthrene	1.67E-08	AP-42, Table 1.4-3	Yes	Yes (General PAH)
Pyrene	4.90E-09	AP-42, Table 1.4-3	Yes	Yes (General PAH)
Toluene	3.33E-06	AP-42, Table 1.4-3	Yes	Yes
Arsenic	1.96E-07	AP-42, Table 1.4-4	Yes	Yes
Beryllium	1.18E-08	AP-42, Table 1.4-4	Yes	Yes
Cadmium	1.08E-06	AP-42, Table 1.4-4	Yes	Yes
Chromium	1.37E-06	AP-42, Table 1.4-4	Yes	Yes
Chromium (VI)	6.86E-08	AP-42, Table 1.4-4	No	Yes
Cobalt	8.24E-08	AP-42, Table 1.4-4	Yes	Yes
Manganese	3.73E-07	AP-42, Table 1.4-4	Yes	Yes
Mercury	2.55E-07	AP-42, Table 1.4-4	Yes	Yes
Nickel	2.06E-06	AP-42, Table 1.4-4	Yes	Yes
Selenium	2.35E-08	AP-42, Table 1.4-4	Yes	Yes

Based on 1020 BTU/scf natural gas heat content

HAP and TAP Emissions for New Production Line

Air Pollutant	Emission Factor, lb/MMBTU	Hourly Emissios		Annual Emissios	
		Heat Rate, MMBtuh	Emissions, lb/hr	Heat Rate, MMBtuh*	Emissions, tpy
EPA Total HAPs	1.85E-03	18	3.33E-02	15.5	1.26E-01
Polycyclic Organic Matter (ID POM Summation)	1.12E-08	18	2.01E-07	15.5	7.59E-07
Acenaphthene	1.76E-09	18	3.18E-08	15.5	1.20E-07
Acenaphthylene	1.76E-09	18	3.18E-08	15.5	1.20E-07
Anthracene	2.35E-09	18	4.24E-08	15.5	1.60E-07
Benz(a)anthracene	1.76E-09	18	3.18E-08	15.5	1.20E-07
Benzene	2.06E-06	18	3.71E-05	15.5	1.40E-04
Benzo(a)pyrene	1.18E-09	18	2.12E-08	15.5	7.99E-08
Benzo(b)fluoranthene	1.76E-09	18	3.18E-08	15.5	1.20E-07
Benzo(g,h,i)perylene	1.18E-09	18	2.12E-08	15.5	7.99E-08
Benzo(k)fluoroanthene	1.76E-09	18	3.18E-08	15.5	1.20E-07
Chrysene	1.76E-09	18	3.18E-08	15.5	1.20E-07
Dibenzo(a,h)anthracene	1.18E-09	18	2.12E-08	15.5	7.99E-08
Dichlorobenzene (mixed isomers)	1.18E-06	18	2.12E-05	15.5	7.99E-05
7,12-Dimethylbenz(a)anthracene	1.57E-08	18	2.82E-07	15.5	1.06E-06
Fluoranthene	2.94E-09	18	5.29E-08	15.5	2.00E-07
Fluorene	2.75E-09	18	4.94E-08	15.5	1.86E-07
Formaldehyde	7.35E-05	18	1.32E-03	15.5	4.99E-03
Hexane	1.76E-03	18	3.18E-02	15.5	1.20E-01
Indeno(1,2,3-cd)pyrene	1.76E-09	18	3.18E-08	15.5	1.20E-07
2-Methylnaphthalene	2.35E-08	18	4.24E-07	15.5	1.60E-06
3-Methylchloroanthene	1.76E-09	18	3.18E-08	15.5	1.20E-07
Naphthalene	5.98E-07	18	1.08E-05	15.5	4.06E-05
Pentane	2.55E-03	18	4.59E-02	15.5	1.73E-01
Phenanthrene	1.67E-08	18	3.00E-07	15.5	1.13E-06
Pyrene	4.90E-09	18	8.82E-08	15.5	3.33E-07
Toluene	3.33E-06	18	6.00E-05	15.5	2.26E-04
Arsenic	1.96E-07	18	3.53E-06	15.5	1.33E-05
Beryllium	1.18E-08	18	2.12E-07	15.5	8.01E-07
Cadmium	1.08E-06	18	1.94E-05	15.5	7.33E-05
Chromium	1.37E-06	18	2.47E-05	15.5	9.30E-05
Chromium (VI)	6.86E-08	18	1.23E-06	15.5	4.66E-06
Cobalt	8.24E-08	18	1.48E-06	15.5	5.59E-06
Manganese	3.73E-07	18	6.71E-06	15.5	2.53E-05
Mercury	2.55E-07	18	4.59E-06	15.5	1.73E-05
Nickel	2.06E-06	18	3.71E-05	15.5	1.40E-04
Selenium	2.35E-08	18	4.23E-07	15.5	1.60E-06

* Air makeup unit operates at maximum 50% of design heat on an annual basis.

Hazardous Air Pollutant Potential to Emit

HAP PTE SUMMARY

Fuel Combustion Activity	Maximimum Fuel Combustion		Total HAP Emission Factor		Maximum HAP Emissions, tons/yr
	Amount	Units	Emission Factor	Units	
Total Installed NG Firing Capacity	438.00	MMBtuh	1.85E-03	lb/MMBtu	3.55
Maximum Permitted #6 Oil Combustion	4,097,682	gal/yr	0.744	lb/kgal	1.52
Maximum Permitted #2 Oil Combustion - Boilers 1 and 2	903	gal/hr	0.0080	lb/kgal	4.09
Maximum Permitted #2 Oil Combustion - Boiler 3	393,120	gal/yr	0.0080	lb/MMBtu	0.20
	HAP PTE Suumation:				*9.37*

Notes: This is a worst case calculation based on maximum firing rates for each fuel. Boilers cannot simultaneously fire NG, No. 2 oil, and NO.6 oil at maximum rates.

Heat content of #2 oil = 0.13 MMBtu/kgal.

HAP Emission Factors for #6 Oil Combustion

Pollutant	Emission Factor, lb/kgal	AP-42 ref table
N2O	0.1100000000	Table 1.3-8
POM	0.0013000000	Table 1.3-8
HCOH	0.0610000000	Table 1.3-8
Benzene	0.0002140000	Table 1.3-9
Ethylbenzene	0.0000636000	Table 1.3-9
Naphthalene	0.0011300000	Table 1.3-9
1,1,1-Trichloroethane	0.0002360000	Table 1.3-9
Toluene	0.0062000000	Table 1.3-9
o-Xylene	0.0001090000	Table 1.3-9
Acenaphthene	0.0000211000	Table 1.3-9
Acenaphthylene	0.0000002530	Table 1.3-9
Anthracene	0.0000012200	Table 1.3-9
Benz(a)anthracene	0.0000040100	Table 1.3-9
Benzo(b,k)fluoranthene	0.0000014800	Table 1.3-9
Benzo(g,h,i)perylene	0.0000022600	Table 1.3-9
Chrysene	0.0000023800	Table 1.3-9
Dibenzo(a,h) anthracene	0.0000016700	Table 1.3-9
Fluoranthene	0.0000048400	Table 1.3-9
Fluorene	0.0000044700	Table 1.3-9
Indo(1,2,3-cd)pyrene	0.0000021400	Table 1.3-9
Phenanthrene	0.0000105000	Table 1.3-9
Pyrene	0.0000042500	Table 1.3-9
OCDD	0.0000000031	Table 1.3-9
Antimony	0.0052500000	Table 1.3-11
Arsenic	0.0013200000	Table 1.3-11
Barium	0.0025700000	Table 1.3-11
Beryllium	0.0000278000	Table 1.3-11
Cadmium	0.0003980000	Table 1.3-11
Chloride	0.3470000000	Table 1.3-11
Chromium	0.0008450000	Table 1.3-11
Chromium VI	0.0002480000	Table 1.3-11
Cobalt	0.0060200000	Table 1.3-11
Copper	0.0017600000	Table 1.3-11
Fluoride	0.0373000000	Table 1.3-11
Lead	0.0015100000	Table 1.3-11
Manganese	0.0030000000	Table 1.3-11
Mercury	0.0001130000	Table 1.3-11
Molybdenum	0.0007870000	Table 1.3-11
Nickel	0.0845000000	Table 1.3-11
Phosphorous	0.0094600000	Table 1.3-11
Selenium	0.0006830000	Table 1.3-11
Vanadium	0.0318000000	Table 1.3-11
Zinc	0.0291000000	Table 1.3-11
HAP summation:	0.7440049761	

HAP Emission Factors for NG Combustion

HAP	lb/MMScf	lb/MMBtu*
Lead	5.00E-04	4.90E-07
POM		
2-Methylnaphthalene	2.40E-05	2.35E-08
3-Methylchloranthrene	1.80E-06	1.76E-09
7,12-Dimethylbenz(a)anthracene	1.60E-05	1.57E-08
Acenaphthene	1.80E-06	1.76E-09
Acenaphthylene	1.80E-06	1.76E-09
Anthracene	2.40E-06	2.35E-09
Benz(a)anthracene	1.80E-06	1.76E-09
Benzo(a)pyrene	1.20E-06	1.18E-09
Benzo(b)fluoranthene	1.80E-06	1.76E-09
Benzo(g,h,i)perylene	1.20E-06	1.18E-09
Benzo(k)fluoranthene	1.80E-06	1.76E-09
Chrysene	1.80E-06	1.76E-09
Dibenzo(a,h)anthracene	1.20E-06	1.18E-09
Fluoranthene	3.00E-06	2.94E-09
Fluorene	2.80E-06	2.75E-09
Indeno(1,2,3-cd)pyrene	1.80E-06	1.76E-09
Phenanathrene	1.70E-05	1.67E-08
Pyrene	5.00E-06	4.90E-09
Benzene	2.10E-03	2.06E-06
Dichlorobenzene	1.20E-03	1.18E-06
Formaldehyde	7.50E-02	7.35E-05
Hexane	1.80E+00	1.76E-03
Naphthalene	6.10E-04	5.98E-07
Toluene	3.40E-03	3.33E-06
Arsenic	2.00E-04	1.96E-07
Beryllium	1.20E-05	1.18E-08
Cadmium	1.10E-03	1.08E-06
Chromium	1.40E-03	1.37E-06
Cobalt	8.40E-05	8.24E-08
Manganese	3.80E-04	3.73E-07
Mercury	2.60E-04	2.55E-07
Nickel	2.10E-03	2.06E-06
Selenium	2.40E-05	2.35E-08
HAP summation	*1.89E+00*	*1.85E-03*

* Based on 1020 Btu/scf

Table 3. HAP Emission Factors for #2 Oil Combustion

	AB 2588 reference		AP-42 reference		Seleted
Pollutant	lb/1000 gal	lb/MMBtu*	lb/1000 gal	lb/MMBtu*	Factor†
acetaldehyde	0.3506	0.002697		-	0.002697
acrolein	0.3506	0.002697		-	0.002697
hydrogen chloride	0.1863	0.001433		-	0.001433
formaldehyde	0.3506	0.002697	0.061	0.000469	0.000469
PAH's (including naphthalene)	0.0498	0.000383		-	0.000383
1,3-butadiene	0.0148	0.000114		-	0.000114
benzene	0.0044	0.000034		-	0.000034
toluene	0.0044	0.000034		-	0.000034
hexane	0.0035	0.000027		-	0.000027
selenium	0.0022	0.000017		0.000015	0.000015
xylenes	0.0016	0.000012		-	0.000012
lead	0.0083	0.000064		0.000009	0.000009
manganese	0.0031	0.000024		0.000006	0.000006
arsenic	0.0016	0.000012		0.000004	0.000004
beryllium	ND	-		0.000003	0.000003
cadmium	0.0015	0.000012		0.000003	0.000003
total chromium	0.0006	0.000005		0.000003	0.000003
mercury	0.002	0.000015		0.000003	0.000003
nickel	0.0039	0.000030		0.000003	0.000003
chlorobenzene	0.0002	0.000002		-	0.000002
ethyl benzene	0.0002	0.000002		-	0.000002
HAP summation:					*7.95E-03*

* Baed on 0.13 MMBtu/gallon

† AB2588 emission factor when AP-42 not available.

APPENDIX B – AMBIENT AIR QUALITY IMPACT ANALYSES

MEMORANDUM

DATE: **June 26**, 2017

TO: **Shawnee Chen**, Permit Writer, Air Program

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

PROJECT: Blackfoot Facility of Basic American Foods, in Blackfoot, Idaho, a Permit to Construct (PTC) P-2017.0011, Project 61851, Facility ID No. 011-00012

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

Basic American Foods (BAF) of Blackfoot, Idaho, submitted an application for a Permit to Construct (PTC) on February 15, 2017, for a modification to an existing facility located in Blackfoot, Idaho, denoted as PTC P-2017.0011.

BAF is a manufacturing facility producing a variety of dried vegetable products. This project will prepare products from a combination of fresh vegetable and previously dried vegetables, and incorporates installing a new production line at the facility, including a two-stage pre-dryer and a dryer. This new line is expected to operate 365 days a year and have a maximum production rate of 70,000 lbs/day of finished product.

Details of the entire process are discussed 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).

Coal Creek Environmental Associates LLC (CCEA) performed the ambient air impact analyses for this project on behalf of BAF. The analyses were performed to demonstrate compliance with applicable 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 is the responsibility of the permit writer and is addressed in the main body of the Statement of Basis. The accuracy of emissions estimates was not evaluated as part of DEQ's review of the air impact analyses submitted and described in this modeling review memorandum.

A modeling protocol was not submitted for this project. CCEA submitted an application on February 15, 2017. On March 15, 2017, DEQ responded with a letter of incompleteness. The reasons for the incompleteness were primarily determination a lack of information and clarifications on some issues. DEQ received a revised application on March 23, 2017. This application was deemed incomplete on April 18, 2017, due to missing information in the EI spreadsheets and process descriptions. A final submittal addressing these issues was received on April 20, 2017. Additionally, the modeling was revised to account for an error in the previous modeling. This application was deemed complete on May 5, 2017.

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 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 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 the criteria pollutants NO_2, PM_{10}, $PM_{2.5}$, and SO_2 associated with the proposed project are above the Level 1 threshold for each pollutant. Therefore, a demonstration of compliance with NAAQS was done for those criteria pollutants and applicable averaging times.	Project-specific air impact analyses demonstrating compliance with NAAQS, as required by Idaho Air Rules Section 203.02, are required for pollutants having an emissions increase that is greater than Level I modeling applicability thresholds, or for pollutant increases above BRC thresholds. Compliance with NAAQS has not been demonstrated for emissions that exceed the emission estimates presented in the application.
TAPS Modeling. Emission rates of the TAPs arsenic, cadmium, chromium (VI), nickel, and formaldehyde exceeded Emissions Screening Level (EL) rates of Idaho Air Rules Section 585 and 586.	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

BAF is an existing facility located in Blackfoot, Idaho, that prepares dried vegetable products. The project is a new production line which includes a two-stage pre-dryer and a dryer, operating in series. It is estimated to operate fill time (ie, 365 days a year) and have a maximum production rate of 70,000 lbs of product per day. The dryer will be natural gas (NG) fired and have installed burner capacities of 6.0 MMBtu/hr for the first pre-dryer stage, 2.0 MMBtu/hr for the second pre-dryer stage, and 5.0 MMBtu/hr for the dryer stage. Particulate emissions from the dryer will be controlled (75% removal) by a Venturi scrubber. Also included

in the project will be a 5 MMBtu/hr air make-up unit (AMU). Emissions from the AMU will be vented through the dryer stacks. Low-NOx burners will be used for the dryers and AMU. Steam from the existing boiler is needed for preparation of the dryer feed materials. The existing Boiler 1 currently has two stacks: a 47-foot stack is used when combusting with natural gas, and a 100 foot stack is used when combusting with oil. As part of this project, Boiler 1 will now use only the taller 100 foot stack.

The changes in the facility from this project are summarized as:

- increased emissions of $PM_{2.5}$, PM_{10}, and SO_2 from the new production line operation
- increased emissions of products of NG combustion
- increased emissions from boilers due to increased steam demands

The air impact analyses performed by CCEA, as part of the permit application, were submitted to show that facility-wide emissions do not cause or contribute to an exceedance of any NAAQS or TAPS AACs or AACCs. A detailed description of the facility is listed in Section 1 of the application.

2.2 Proposed Location and Area Classification

The BAF facility is located at 415 West Collins Road, Blackfoot, Idaho. 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 using methods and data as 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*[l] (*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]

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]**
	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 CCEA, as listed in this memorandum, 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 the modification-related or facility-wide potential to emit (PTE) values for a specific criteria pollutant 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.

DEQ has generated non-site-specific project modeling thresholds for those projects that cannot use the BRC exemption from an impact analysis (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. The submitted application did not evaluate estimated emissions increases against BRC thresholds, and it was assumed that the project would not qualify for the BRC exclusion from NAAQS compliance demonstration. The submitted modeling report evaluated modeling applicability based on comparison of emissions to Level 1 Modeling Applicability Thresholds. Emissions of all criteria pollutants except CO and Lead resulting from the proposed project are greater than the Level 1 modeling thresholds, and therefore air impact analyses are required for these criteria pollutants.

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	1.6 ton/yr[a]	1.0	0.350	4.1	Yes
	24-hour	0.36 lb/hr[b]		0.054	0.63	Yes
PM_{10}	24-hour	0.42 lb/hr[b]	1.5	0.22	2.6	Yes
NOx	Annual	3.4 ton/yr[a]	4.0	1.2	14	Yes
	1-hour	0.85 lb/hr[b]		0.2	2.4	Yes
SO_2	Annual	2.4 ton/yr[a]	4.0	1.2	14	Yes
	1-hour	0.55 lb/hr[b]		0.21	2.5	Yes
CO	1,8 hour	1.6 lb/hr[b]	10.0	15	175	No
Lead	Annual	.01 lb/mo	0.06	14 pounds/month		No

a.	Modeling applicability based on the BRC exemption was not evaluated for the project.
b.	Approval for use of Level II Modeling Applicability Thresholds was not requested by BAF.

[a] - tons per year[b] – pounds per hour

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 based on 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 five TAPs having potential emission increases that could exceed screening emissions levels (ELs) of Idaho Air Rules Section 585 or 586. Potential increases in emissions of other TAPs were all less than applicable ELs. Table 4 lists emission increases for theses TAPs and compares them to the EL.

Table 4. MODELED TAP EMISSIONS RATES

Pollutant	CAS No.	Total Emissions Increase (lbs/hr)[a]	Screening Emissions Level (EL) (lbs/hr)
Arsenic	7440-38-2	3.53E-06	1.5E-06
Cadmium	7440-43-9	1.94E-05	3.7E-06
Formaldehyde	50-00-0	1.32E-03	5.1E-04
Chromium (VI)	18540-29-9	1.23E-06	5.60E-07
Nickel	7440-02-0	3.71E-05	2.70E-05

a. Pounds/hour, PTE.

Table 5 provides source-specific TAP emission rates as provided in the air impact analyses. These values are about 86% of the values listed in Table 4. However, maximum impacts, when modeled with these emissions proportionally increased by a factor of (1/0.86), are still much less than AACC threshold values. These results are listed in Table 9.

Table 5. TAPS EMISSIONS AS MODELED BY SOURCE

Source ID	Arsenic (lb/hr)[a]	Cadmium (lb/hr)	Formaldehyde (lb/hr)	Chromium (lb/hr)	Nickel (lb/hr)
NND[b]	1.75E-06	9.67E-06	7.58E-04	6.1E-07	1.84E-05
NNG[c]	1.28E-06	7.07E-06	4.82E-04	4.5E-07	1.35E-05

a. Pounds/hour
b. Predryer
c. Dryer/Scrubber

3.2 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. Derivation of stack parameters in past projects for this facility were based on field testing at similar facilities for BAF. The applicant stated that the new sources in this project would be constructed with the provided stack parameters.

Table 6. MODELING PARAMETERS

Source ID	Source Description	Easting (X)[a] (m)	Northing (Y)[b] (m)	Stack Height (ft)[c]	Temp. (°F)[d]	Exit Velocity (fps)[e]	Stack Diam. (ft)[c]
BLR2_NG	Boiler 2 natural gas	387740	4784181	50	300	43.6	3.5
BLR1_2_Oil2	Boiler1/2 #2 Oil	387767	4784172	100	116	50.0	3.5
BLR1_2_Oil6	Boiler 1/2 #6 Oil	387767	4784172	100	116	50.0	3.5
NND	Pre-dryer	387741	4784028	60	116	38.1	3.5
NNG	Dryer/Scrubber	387746	4784033	70	87	42.9	4

a. Universal Transverse Mercator coordinates in meters in the east/west direction.
b. Universal Transverse Mercator coordinates in meters in the north/south direction.
c. Feet.
d. Temperature in degrees Fahrenheit.
e. Feet/second.

3.2 Background Concentrations

Background concentrations were not required for this project, as all modeled impacts were less than the Significant Impact Levels (SIL) for all criteria pollutants, demonstrating that the project would not have a significant contribution to any NAAQS violation. Therefore, there was no modeling to demonstrate compliance with NAAQS for criteria pollutants.

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

CCEA 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	Blackfoot, 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 16216r
Meteorological Data	2002-2006 onsite data from INL/Mt View School site in Blackfoot, ID, NWS from Pocatello, ID, and upper air data from Boise, ID	See Section 3.3.4 for a detailed discussion on the meteorological data.
Terrain	Considered	See Section 5.3 below.
Building Downwash	Considered	Because there are substantial buildings at the BAF facility, BPIP-PRIME was used to evaluate building dimensions for consideration of downwash effects in AERMOD.
Receptor Grid	Grid 1	10-meter spacing along the areas of maximum impact,
	Grid 2	25-meter spacing out to distances of 250 meters with respect to the facility
	Grid 3	100-meter spacing out to approximately 1000 meters

3.3.2 Modeling protocol and Methodology

A modeling protocol was not submitted for this project. CCEA submitted a PTC application on February 15, 2017. On March 15, 2017, DEQ responded with a letter of incompleteness primarily because of the lack of information and clarifications on data used in the analyses. DEQ received a revised application on March 23, 2017. This application was deemed incomplete on April 18, 2017, mainly because of missing information in the EI spreadsheets and process descriptions. A final submittal was received on April 20, 2017, and addressed these issues. Additionally, the modeling was revised to account for an error in the previous modeling. This application was deemed complete on May 5, 2017.

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].

The project was assessed with four options that may exist for process operation:

- Boiler 1 with natural gas firing, exiting through the 100-foot tall scrubber stack
- Boiler 2 with natural gas firing, exiting through the 100-foot tall scrubber stack
- Boiler 1/2 with #2 oil firing. Worst case for whichever of the two boilers generates highest emissions
- Boiler 1/2 with #6 oil firing. Worst case for whichever of the two boilers generates highest emissions

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 16216r was used by the applicant for the air impact 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

CCEA used meteorological data collected at the nearby INL monitoring site at the Mt. View Middle School in Blackfoot, Idaho, for the period 2002-2006. This data was supplemented with NWS airport data from the Pocatello, Idaho, station KPIH. Upper air data was taken from the Boise, Idaho, airport. DEQ determined the meteorological data used in the submitted analyses was representative for modeling for this permit in the locale of BAF.

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). CCEA used 1 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 the facility layout used in the model to that indicated in aerial photographs on Google Earth. The modeled layout was consistent 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 emissions plumes at the facility.

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 BAF facility is limited by either an existing fenceline or a physical building structure on the edge of the facility property. This approach is adequate to preclude public access to areas excluded from the air impact assessment.

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 of 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

Because estimated emissions for the project were above Level I Modeling Applicability Thresholds, air quality dispersion modeling was necessary for all criteria pollutants. The ambient air impact analyses submitted with the PTC application demonstrated to DEQ's satisfaction that emissions as modeled did not exceed the significant impact levels for all criteria pollutants. These results, performed for all four modeled scenarios, are listed in Table 8.

Table 8. Criteria SIL MODELING RESULTS[c]

Pollutant	Averaging Period	Boiler Firing Scenario	Modeled Conc. ($\mu g/m^3$)[a]	Significant Impact Level (SIL) ($\mu g/m^3$)	Percentage of SIL
$PM_{2.5}$	24-hour	Boiler 1 – NG	1.06	1.2	88%
		Boiler 2 – NG	1.06		88%
		Boilers 1 & 2 – No. 2 Oil	1.06		88%
		Boilers 1 & 2 No. 6 Oil	1.06		88%
	Annual	Boiler 1 – NG	0.28	0.3	95%
		Boiler 2 – NG	0.29		95%
		Boilers 1 & 2 – No. 2 Oil	0.29		95%
		Boilers 1 & 2 – No. 6 Oil	0.29		96%
PM_{10}	24-hour	Boiler 1 – NG	1.33	5.0	27%
		Boiler 2 – NG	1.33		27%
		Boilers 1 & 2 – No. 2 Oil	1.34		27%
		Boilers 1 & 2 No. 6 Oil	1.34		27%

NO_2	1-hour	Boiler 1 – NG	6.17	7.5	82%
		Boiler 2 – NG	6.50		87%
		Boilers 1 & 2 – No. 2 Oil	6.21		83%
		Boilers 1 & 2 No. 6 Oil	6.28		84%
	Annual	Boiler 1 – NG	0.36	1.0	36%
		Boiler 2 – NG	0.36		36%
		Boilers 1 & 2 – No. 2 Oil	0.37		37%
		Boilers 1 & 2 No. 6 Oil	0.41		41%
SO_2	1-hour	Boiler 1 – NG	0.76	7.8	10%
		Boiler 2 – NG	0.78		10%
		Boilers 1 & 2 – No. 2 Oil	1.17		15%
		Boilers 1 & 2 No. 6 Oil	3.20		41%
	3-Hour	Boiler 1 – NG	0.45	25	2%
		Boiler 2 – NG	0.47		2%
		Boilers 1 & 2 – No. 2 Oil	0.70		3%
		Boilers 1 & 2 – No. 6 Oil	2.11		8%
	24-hour	Boiler 1 – NG	0.12	5.0	2%
		Boiler 2 – NG	0.12		3%
		Boilers 1 & 2 – No. 2 Oil	0.34		7%
		Boilers 1 & 2 No. 6 Oil	1.11		22%
	Annual	Boiler 1 – NG	0.03	1.0	3%
		Boiler 2 – NG	0.03		3%
		Boilers 1 & 2 – No. 2 Oil	0.05		5%
		Boilers 1 & 2 No. 6 Oil	0.14		14%

a. Micrograms per cubic meter.

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 are several TAPs emissions that exceeds the ELs, modeling analyses were needed to demonstrate compliance with those AACs and AAACs. Results are listed in Table 9 and show compliance with all AACs and AAACs.

Table 9. TAP MODELING RESULTS[c]

Pollutant	CAS No.	Average	Modeled Conc. ($\mu g/m^3$)[a]	AAC/AAAC[b] ($\mu g/m^3$)	%AAC/AAAC
Arsenic	7440-38-2	Annual	3.23E-06	2.3E-04	1%
Cadmium	7440-43-9	Annual	1.75E-05	5.6E-04	3%
Chromium (VI)	18540-29-9	Annual	1.12E-06	8.3E-05	1%
Formaldehyde	50-00-0	Annual	1.20E-03	7.7E-02	2%
Nickel	7440-02-0	Annual	3.37E-05	4.2E-03	1%

a. Micrograms per cubic meter.
b. Acceptable Ambient Concentration or Acceptable Ambient Concentration of a Carcinogen.
c. Results have been factored by emissions as listed in application

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 BAF 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.

APPENDIX C – FACILITY DRAFT COMMENTS AND DEQ'S RESPONSE

The following comments were received form the facility on July 5 and July 21, 2017

REFERENCE	EXISTING LANGUAGE	REQUESTED CHANGE	JUSTIFICATION	DEQ'S RESPONSE
1. Section 1.1	This is the initial permit to construct (PTC) for a new production line at an existing facility.	Change to: "This is the initial permit to construct (PTC) for Production Line C-8 at the Blackfoot Facility of Basic American Foods. Production Line C-8 is part of Process C at the facility."	Provide additional clarification of the equipment regulated by the permit.	Changed.
2. Section 1.1	Table 1.1 lists all sources of regulated emissions in this permit.	Add: "The descriptions in Table 1 are for information only and are not enforceable conditions. Enforceable conditions are identified in Section 2 of this permit."	Because the document is a permit to construct, some observers could interpret the contents of Table 1 as permit conditions. By stating that Table 1 is only informational, the permit will make clear that the descriptions in Table 1 are not enforceable requirements.	To follow DEQ's PTC template, the language is not included in the PTC. "The information in the table is used for the permitting analyses and is for informational purpose. The descriptions in Table 1.1 are not enforceable requirements." is added to Permit Conditions Review section of the SOB.

REFERENCE	EXISTING LANGUAGE	REQUESTED CHANGE	JUSTIFICATION	DEQ'S RESPONSE
3. Table 1.1 – description of wet scrubber	Operating pressure drop range: 17 to 25 inch H2O.	Delete.	The purpose of the scrubber is to remove particulates, and that activity happens in the venturi throat. The additional pressure drop that occurs in the scrubber has little relevance to particulate removal. We have confirmed with the vendor that the overall scrubber pressure drop is not relevant to their performance guarantee, and that pressure drop across the Venturi throats is the only parameter needed for the emissions guarantee	Deleted
4. Section 2	Applicant: do you have a name for this process?	Identify as: "Production Line C-8"	N/A	Changed.
5. Section 2.1	Process Description The production line will prepare …	Change to: "Production Line Description Production line C-8 will prepare …"	The "process" is Process C. This is a production line within Process C.	Changed except that "Process Description" is kept as it is to follow DEQ's permit template.

<table>
<tr><th>REFERENCE</th><th>EXISTING LANGUAGE</th><th>REQUESTED CHANGE</th><th>JUSTIFICATION</th><th>DEQ'S RESPONSE</th></tr>
<tr>
<td>6. Table 2.1 Pre-dryer and Dryer Emission Limits</td>
<td>
Table 2.1 Pre-dryer and Dryer Emission Limits
<table>
<tr><th rowspan="2">Source Description</th><th colspan="2">PM2.5 (b)</th><th colspan="2">PM10[(b)]</th><th colspan="2">SO2</th><th colspan="2">NOX</th><th colspan="2">CO</th><th colspan="2">VOC</th></tr>
<tr><th>lb/hr (c)</th><th>T/yr (d)</th><th>lb/hr (c)</th><th>T/yr (d)</th><th>lb/hr (c)</th><th>T/yr (d)</th><th>lb/hr (c)</th><th>T/yr (d)</th><th>lb/hr (c)</th><th>(d) T/yr</th><th>lb/hr (c)</th><th>T/yr (d)</th></tr>
<tr><td>Pre-dryer stack</td><td>0.216</td><td>0.95</td><td>0.233</td><td>1.02</td><td>0.013</td><td>0.058</td><td>0.289</td><td>1.14</td><td rowspan="2">1.48</td><td rowspan="2">5.59</td><td rowspan="2">0.10</td><td rowspan="2">0.37</td></tr>
<tr><td>Dryer stack</td><td>0.129</td><td>0.57</td><td>0.163</td><td>0.71</td><td>0.022</td><td>0.094</td><td>0.155</td><td>0.47</td></tr>
</table>
</td>
<td>Delete annual emission limits for PM10 and CO.

Delete all emission limits for VOC.</td>
<td>Because there are no annual ambient air quality standards for PM10 or CO, there is no regulatory basis for setting annual emission limits for these pollutants.

There is no ambient air quality limit for VOC and potential VOC emissions from the new facilities are not large enough to trigger VOC emissions consideration. Thus, there is no regulatory basis for setting VOC emissions limits.</td>
<td>Deleted

The information (i.e., emission rates) is added to the SOB.</td>
</tr>
</table>

REFERENCE	EXISTING LANGUAGE	REQUESTED CHANGE	JUSTIFICATION	DEQ'S RESPONSE
7. 2.7 Finished Product Production Rate Limit	The finished product (i.e., dried vegetable product) shall not exceed 70,000 pounds per day.	Replace production rate limit with calculation of emissions using emission factor multiplied by production rate. See attached draft permit for proposed alternate language.	Using mass-based emission limits provides greater flexibility in facility operation. This reduces the workload for the facility, creates incentives for the facility to operate the line more efficiently and with lower emissions, and reduces DEQ workload by minimizing the need for iterative PTC actions.	Revised. Refer to PC 2.7 for details. If the production rate increase is due to a physical change to the production line, then the applicant will need to look into the definition of "modification" in Air Rules and to see whether a permit or an exemption is needed.

The following comments were received form the facility on July 5 and July 21, 2017

REFERENCE	EXISTING LANGUAGE	REQUESTED CHANGE	JUSTIFICATION	DEQ'S RESPONSE
8. 2.10.2 Venturi Scrubber Operating Requirements	The operating pressure range shall be maintained between 17 to 25 inches of water.	Remove	The purpose of the scrubber is to remove particulates, and that activity happens in the venturi throat. The additional pressure drop that occurs in the scrubber has little relevance to particulate removal. We have confirmed with the vendor that the overall scrubber pressure drop is not relevant to their performance guarantee, and that pressure drop across the Venturi throats is the only parameter needed for the emissions guarantee.	Removed. Based on the justification provided and the information in the application, language for the pressure drop across the throat at MicroMist Venturi stage of the scrubber is revised. Refer to PC 2.9.2 of the final permit for details.

REFERENCE	EXISTING LANGUAGE	REQUESTED CHANGE	JUSTIFICATION	DEQ'S RESPONSE
9. 2.10.2 Venturi Scrubber Operating Requirements	The scrubbing liquid recirculation rate shall be greater than or equate to 178 gallons per minute.	Modify: "Scrubbing liquid recirculation rate shall be greater than the recirculation rate during the most recent performance test demonstrating compliance with emissions limits. Until an initial performance demonstrating compliance with emissions limits is completed, the recirculation shall be greater than or equal to 178 gallons per minute."	Scrubber liquid rate is a parameter that can be (and should be) established based on performance testing after the equipment is installed and operating. This compliance approach is used for continuous compliance demonstration in various MACT standards.	Modified
10. 2.10.3 The permittee shall operate the following monitoring devices	A device to continuously measure the operating pressure drop in inches of water	Remove	Not relevant to particulate removal. See comment above re Section 2.10.2.	Removed

The following comments were received form the facility on July 5 and July 21, 2017

REFERENCE	EXISTING LANGUAGE	REQUESTED CHANGE	JUSTIFICATION	DEQ'S RESPONSE
11. 2.11 Allowable Maximum Steam Monitoring	To demonstrate compliance with the Allowable Maximum Steam Limit of the permit, the permittee shall monitor and record the steam usage for the new production line hourly.	Change: "…the permittee shall record the steam usage for the new production line daily as a 24-hour block average. A "day" shall be either a calendar day (midnight to midnight) or a plant "operating day" (e.g., start of "day shift" on consecutive days). When the plant does not operate for a full 24-hour day, any downtime will be logged as zero production for those hours."	Daily monitoring is consistent with the monitoring and recording requirements of existing permits and greatly minimizes data management. The proposed language also allows the monitoring to synch with facility operational data, and clarifies that each day is a distinct 24-hr time block.	Not changed. The hourly limit is to ensure that this project would not cause or significantly contribute to a violation of 1-hr NOx NAAQS.
12. 2.12 Finished Product Production Rate Monitoring	To demonstrate compliance with the Finished Product Production Rate Limit of the permit, the permittee shall monitor and record the total finished product of this production line in pounds per day, each day of the operation	See attached draft permit revisions for the complete text of proposed revisions.	These changes are needed to implement our proposed revisions to Section 2.7. The proposed language describes how emissions calculations are to be performed in manner that is enforceable. This compliance calculation approach has been used in other permits.	Revised. Refer to PC 2.11 of the final permit for details.

The following comments were received form the facility on July 5 and July 21, 2017

REFERENCE	EXISTING LANGUAGE	REQUESTED CHANGE	JUSTIFICATION	DEQ'S RESPONSE
13. 2.13 Heat Input Rate Monitoring	The permittee shall maintain documentation showing that the heat input rates of the air makeup unit, pre-dryer, and dryer meet Heat Input Rate Limits of the permit.	Add: "Manufacturer or vendor technical specifications for installed equipment are acceptable documentation."	The proposed language clarifies that compliance with the heat rate limits can be demonstrated with vendor technical specifications for the installed equipment.	This permit conditions is removed because the information is listed in Table 2.1 and regulated under "Permit Authority" of the cover page of the permit.
14. 2.14 Low NOx Burner Requirements Monitoring	The permittee shall maintain documentation showing that the burners of the air makeup unit, pre-dryer, and dryer meet Low NOx Burner Requirements of the permit.	"Manufacturer or vendor technical specifications are acceptable documentation."	The proposed language clarifies that compliance with the heat rate limits can be demonstrated with vendor technical specifications for the installed equipment.	Added. "Low NOx Burner Requirements Monitoring" is changed to "Low NOx Burner Requirements **Recordkeeping**" Having the documentation does not preclude an inspector to check the plates of the equipment to determine compliance.
15. 2.15 Venturi Scrubber Operating Requirements Monitoring	The operating pressure drop in inches of water weekly.	Remove	Ancillary pressure drop in the scrubber has little relevance to particulate removal. See discussion of Section 2.10.2, above.	Removed

The following comments were received form the facility on July 5 and July 21, 2017

REFERENCE	EXISTING LANGUAGE	REQUESTED CHANGE	JUSTIFICATION	DEQ'S RESPONSE
16. 2.16.1 Initial Performance Test for NOx, PM2.5, and PM10	Within 180 days after startup of the new production line, the permittee shall conduct a performance test on pre-dryer and dryer respectively to demonstrate compliance with NOx, PM2.5, and PM10 emissions limits in Permit Condition 2.3 and the heat input rate limits in Permit Condition 2.8. …	Append the following to this sentence: ", to determine revised emission factors for PM2.5 and PM10, and to identify a minimum scrubber liquor flow rate."	These changes are needed to implement changes requested to base emissions compliance on emission factors established during source testing and to base scrubber liquid flow requirements on source testing.	Added Also added other verbiage for clarification purpose. Refer to PC 2.14.1 of the final permit for details.
17. 2.16.3 Initial Performance Test for NOx, PM2.5, and PM10	For testing the pre-dryer · The steam usage in lb once every 15 minutes For testing the dryer · The steam usage in lb once every 15 minutes	Remove both	Steam usage has no relation to pre-dryer or dryer emissions.	For 1-hr NOx compliance, the maximum steam rate of 920 lb/hr was used in the permitting analysis. The performance test is also for verifying that the steam usage for the production line does not exceed the 920 lb/hr limit.

The following comments were received form the facility on July 5 and July 21, 2017

REFERENCE	EXISTING LANGUAGE	REQUESTED CHANGE	JUSTIFICATION	DEQ'S RESPONSE
18. 2.16.3 Initial Performance Test for NOx, PM2.5, and PM10	For testing the pre-dryer · The finished product in lb once every 15 minutes · ~~The natural gas usage of the pre-dryer in standard cubic feet once every 15 minutes~~ For testing the dryer · The finished product in lb once every 15 minutes · ~~The natural gas usage of the dryer in standard cubic feet once every 15 minutes~~ · The pressure drop across the throat at MicroMist venture stage of the scrubber in inches of water once every 15 minutes	Delete requirement to monitor NG usage during stack test. Change all remaining instances of "once" to: "a minimum of once"	Compliance with heat input limits of the permit is established via vendor technical specifications provided per §2.13, in conjunction with calculations of actual heat rate based on CO2 and O2 data collected during stack testing. With this information it is not necessary to also monitor NG usage during the stack test. The inclusion of a "minimum of once" makes clear that more frequent data collection is acceptable. .	Deleted NG monitoring during source test. Changed all remaining instances of "once" to: "a minimum of once" Calculating the air make-up unit firing rate has been added to the permit because air make-up emissions are emitted through the pre-dryer and dryer stacks. At maximum firing rate, the air make-up unit emits 18% of the total emissions from the dryer according to the 7/18/2017 email. The air make-up unit information would be used when developing new EFs for the pre-dryer and dryer.

REFERENCE	EXISTING LANGUAGE	REQUESTED CHANGE	JUSTIFICATION	DEQ'S RESPONSE
19. 2.16.3 Initial Performance Test for NOx, PM2.5, and PM10	The overall operating pressure (i.e., pressure drop across the scrubber) in inches of water once every 15 minutes	Remove	Ancillary pressure drop in the scrubber has little relevance to particulate removal. See discussion of Section 2.10.2, above.	Removed
20. 2.16.3 Initial Performance Test for NOx, PM2.5, and PM10	The scrubbing liquid recirculation rate in gallons once every 15 minutes	Change to "gallons per minute a minimum of once every 15 minutes"	Clarification	Changed
21. 2.16.4 Initial Performance Test for NOx, PM2.5, and PM10	The test report shall contain all heat input rate calculations to demonstrate compliance with Heat Input Limits permit condition for the pre-dryer and dryer burners.	Change to: "The test report shall contain all heat input rate calculations based on stack gas measurements of oxygen and carbon dioxide to demonstrate compliance with Heat Input Limits permit condition for the pre-dryer, dryer, and air make-up unit burners."	Clarification that the compliance demonstration of heat rate during that stack test is based on calculated heat rate based on CO2 and oxygen concentrations.	Changed
22. 2.16.5 Initial Performance Test for NOx, PM2.5, and PM10	None.	Add new section 2.16.5: "The test report shall include a calculation of emission factors for PM2.5 and PM10 (in lb/1000 lb finished product. The emission factor derived during from performance shall be used in subsequent calculations of emissions as required in this permit."	These changes are needed to implement our proposed revisions to Section 2.7 in a manner that is enforceable. The proposed language describes how emissions factors used for determining compliance status are to be obtained.	Added

REFERENCE	EXISTING LANGUAGE	REQUESTED CHANGE	JUSTIFICATION	DEQ'S RESPONSE
23. 2.16.6 Initial Performance Test for NOx, PM2.5, and PM10	None.	Add new section 2.16.6: "The test report shall include a calculation of scrubber liquid recirculation rate during the stack test. "	Needed to implement prior recommendation to use source testing to set operating parameters for scrubber liquid flow rate.	Added Also add "…pressure drop across the throat at MicroMist Venturi stage"
24. 2.16.7 Initial Performance Test for NOx, PM2.5, and PM10	None.	Add new section 2.16.7: "All calculations using operating data during the test shall use 15-minute black averages, with averaging conducted for the duration of a given sample run."	Provide clarification on the data reduction methods to be used to derive compliance indication parameters from source testing.	Added
25. 2.17 Subsequent Performance Test for NOx and PM2.5	Periodic performance tests shall be conducted according to the following schedule: …	Add the following to the bulleted list: "The permittee may conduct additional voluntary stack testing for any purpose, including updating the emission factor used in emission calculations. Any testing to update the emission factor shall comply with the performance testing requirements of this permit."	Clarification and implementation of prior recommendations to use stack to develop emission factors and minimum scrubber liquid recirculation rates.	Added
26. Statement of Basis *Potential to Emit*	"HAP PTE were based on emission factors from source test data"	HAP PTE is based on AP-42	Technical correction	Corrected

<table>
<tr><th>REFERENCE</th><th>EXISTING LANGUAGE</th><th>REQUESTED CHANGE</th><th>JUSTIFICATION</th><th>DEQ'S RESPONSE</th></tr>
<tr><td>27. Statement of Basis Permit Conditions Review</td><td>Permit condition 2.3 includes the emissions limits. Limits in lb/hr are the modeled short term rates used in the ambient impact analysis. Limits in T/yr are calculated by multiplying the modeled annual average rates in lb/hr with 8,760 hr/yr and 1 T/2000 lb.</td><td>Add language indicating that T/yr limits are set for those pollutants that have annual averaging time.</td><td>PM10 is a modeled pollutant, but there is no annual averaging period in the PM10 NAAQS. Therefore, a T/yr limit is not needed for PM10.</td><td>T/yr limit for PM_{10} is removed.</td></tr>
<tr><td>28. Statement of Basis Permit Conditions Review</td><td>The total VOC emissions from the pre-dryer stack and dryer stack are 0.10 lb/hr and 0.37 T/yr. They are put into the permit to follow the current permitting procedures though no specific regulatory reasons or requirements exist to put them into the permit.

The total CO emissions from the pre-dryer stack and dryer stack are 1.48 lb/hr and 5.59 T/yr. The hourly rate is way below the modeling threshold. These rates are put into the permit to follow the current permitting procedures though no obvious regulatory reasons and basis exist for putting them into the permit.</td><td>Remove</td><td>If the limits are not needed for an air quality demonstration and are not needed to meet a performance standard or SIP requirement, than there is no reason to put them into the permit.</td><td>Removed</td></tr>
<tr><td colspan="5">Comments on the 2nd draft permit received on 7/21/2017</td></tr>
<tr><td>29. Permit Condition 2.3 Table 2.1</td><td><table>
<tr><th rowspan="2">Source Description</th><th colspan="2">$PM_{2.5}$ [b]</th><th>PM_{10} [b]</th></tr>
<tr><th>lb/hr [c]</th><th>T/yr [d]</th><th>lb/hr [c]</th></tr>
<tr><td>Pre-dryer stack [e]</td><td>0.216</td><td>0.95</td><td>0.233</td></tr>
<tr><td>Dryer stack [e]</td><td>0.129</td><td>0.57</td><td>0.163</td></tr>
</table></td><td>Change to lb/day for short-term $PM_{2.5}$ and PM_{10} limits.</td><td>To be consistent with the form of the $PM_{2.5}$ NAAQS and PM_{10} NAAQS.</td><td>Changed</td></tr>
</table>

REFERENCE	EXISTING LANGUAGE	REQUESTED CHANGE	JUSTIFICATION	DEQ'S RESPONSE
30. Permit Condition 2.7.2	Once the new emission factors based on source test on each stack are approved by DEQ, the finished product (i.e., dried vegetable product) shall not exceed the production rate allowed according to Permit Condition 2.12.	Once the new emission factors based on source test on each stack are approved by DEQ, emissions of PM2.5 and PM10 shall be calculated by multiplying measured production by the emission factor, as set forth in Permit Condition 2.12. Emissions of PM2.5 and PM10 shall not exceed the emission limits established in Table 2.1.	This does not sync with Condition 2.12. Condition 2.12 does not create an allowable production rate after new emission factors are established. See proposed alternate language.	Changed
31. Permit Condition 2.16.3	• The air make-up unit firing rate during the test	Remove	How are we going to do this unless we put a gas meter on the air make-up unit? It should be sufficient to just calculate the heat input being exhausted through the stack. Permit Condition 2.16.4 should suffice. No need to separately measure air make-up unit firing rate.	Removed

APPENDIX D – PROCESSING FEE

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	3.39	0.000	3.39
SO_2	2.41	0.000	2.41
CO	6.00	0.000	6.00
PM_{10}	1.82	0.000	1.82
VOC	0.39	0.000	0.39
TAPS/HAPS	0.35	0.000	0.35
Total:	14.36	0.000	**14.36**
Fee Due	$ 5,000.00		