Statement of Basis

Permit to Construct No. P-2015.0018
Project ID 61630

CS Beef Packers, LLC
Kuna, Idaho

Facility ID 001-00323

Final

April 8, 2016
Kelli Wetzel KW
Permit Writer

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

ACRONYMS, UNITS, AND CHEMICAL NOMENCLATURE

AAC	acceptable ambient concentrations
AACC	acceptable ambient concentrations for carcinogens
acfm	actual cubic feet per minute
ASTM	American Society for Testing and Materials
Btu	British thermal units
CAA	Clean Air Act
cfm	cubic feet per minute
CFR	Code of Federal Regulations
CI	compression ignition
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
GHG	greenhouse gases
gr	grains (1 lb = 7,000 grains)
HAP	hazardous air pollutants
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
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
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
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
RICE	reciprocating internal combustion engines
Rules	*Rules for the Control of Air Pollution in Idaho*
scf	standard cubic feet
SCL	significant contribution limits
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
U.S.C.	United States Code
VOC	volatile organic compounds
yd^3	cubic yards
$\mu g/m^3$	micrograms per cubic meter

FACILITY INFORMATION

Description

CS Beef Packers, LLC is a beef packing and by-product rendering facility in Kuna. The facility is capable of processing up to 1,700 head of cattle per day. The facility produces a range of edible beef products and inedible beef byproducts, including meat and bone meal (MBM), dried blood meal, tallow, and beef hides. Emission units include rendering equipment, material handling, four boilers, wastewater treatment, two emergency generators, and air make-up units. Control equipment is used to reduce particulate matter and odors generated by the rendering process.

Cattle enter the main building and go through several processing steps resulting in various edible beef products. Coolers and freezers are used to keep products at appropriate temperatures prior to shipment off-site.

Byproducts from the packing plant are processed through a steam-heated continuous cooker, where beef fat/tallow is separated from meat and bone meal (MBM). Tallow is stored in four 30,500 gallon storage tanks prior to shipment off-site. An estimated 4.25 dry tons per hour (tph) of MBM from the cooker system is ground and screened before an enclosed auger transfers dried MBM into two storage bins prior to shipment off-site. Process air from the grinder and screener pass through a cyclone separator to collect MBM product. Exhaust from the process cyclone is routed to emission controls.

Blood from the beef packing plant is processed in a 4.5 MMBtu/hr natural gas-fired blood dryer. Dried blood meal is separated from the dryer process air stream using two cyclone separators. Exhaust from the process cyclones is routed to emission controls. An estimated 0.59 tph of dried blood meal is pneumatically conveyed to a storage bin prior to shipment off-site. A bin vent filter is installed on the dried meal storage tank, and exhaust air from the filter is ducted inside the rendering building.

Salt is used to preserve the cow hides for shipment off-site. Trucks will periodically deliver salt to the facility, where the salt is transferred to a storage bin. The storage bin is equipped with a 400 cubic feet per minute (cfm) bin vent filter to control any particulate generated from transferring salt to the storage bin.

MBM and blood meal is periodically transferred from their storage tanks to semi-trucks for shipment off-site. Trucks park inside the loading area of the rendering plant, where the area can be enclosed with rolling doors. Ventilation air from the rendering plant building, including the loading area, is routed to packed bed scrubbers for odor control.

Control equipment is used to reduce particulate matter and odors generated by the rendering process. Exhaust air from the blood dryer system is routed to Venturi Scrubber 1 (VS1) in series with the Packed Bed Scrubber 1 (PBS1). Approximately 63,000 cfm of rendering plant ventilation air is combined with the exhaust from PBS1 and routed to Packed Bed Scrubber 3 (PBS3).

Exhaust air from the continuous cooker, presses, centrifuge, drainer, screw conveyors, tallow polisher, and SWECO screen is routed to Venturi Scrubber 2 (VS2) in series with Packed Bed Scrubber 2 (PBS2). Exhaust air from the MBM grinder and screener cyclone, along with 16,000 cfm of rendering plant ventilation air is combined with the exhaust from PBS2 and routed to Packed Bed Scrubber 4 (PBS4).

The packed bed scrubbers use a solution of sodium hypochlorite and sodium hydroxide to oxide odorants from rendering plant equipment exhaust and plant ventilation air.

Below is a process flow diagram for the proposed facility.

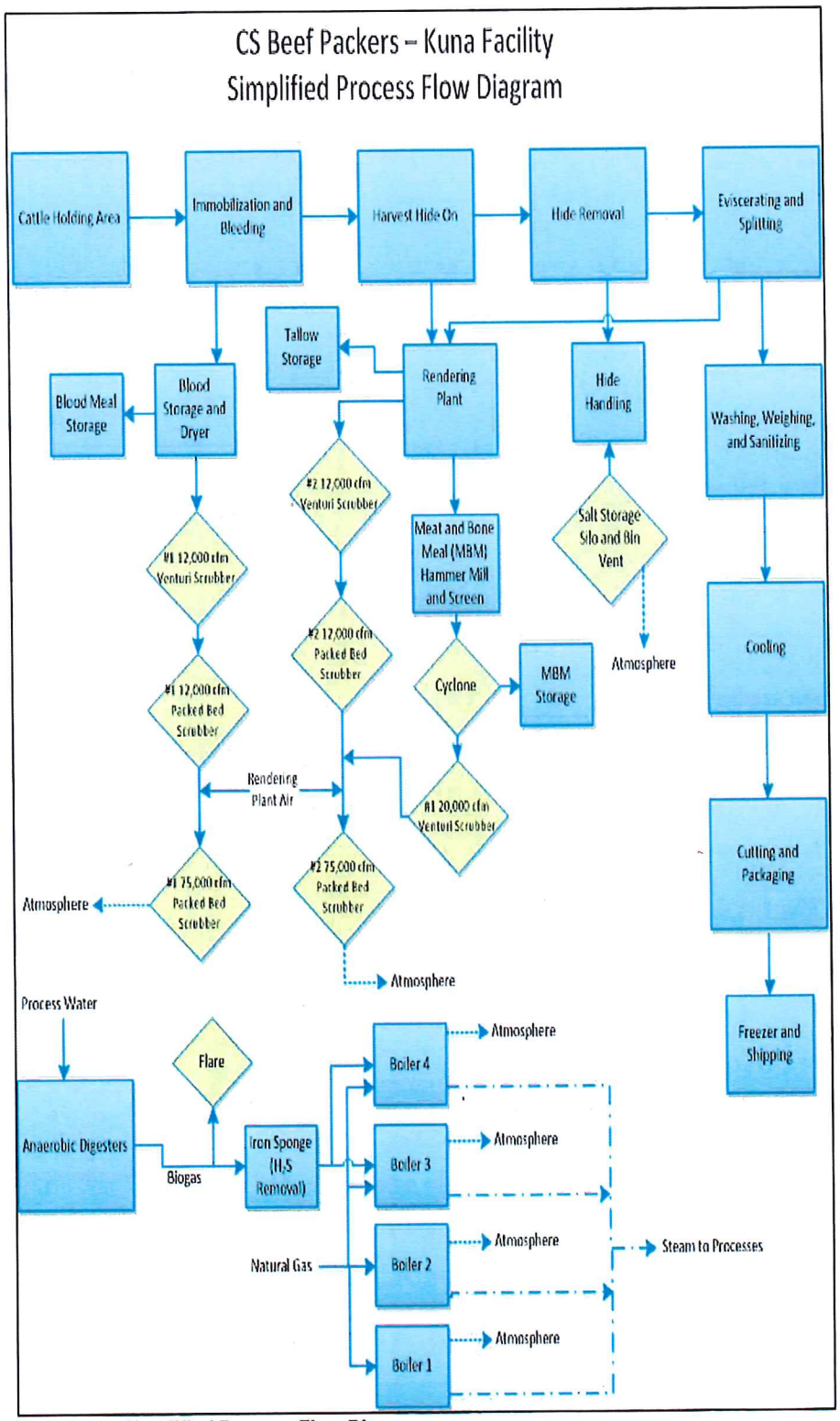

Figure 2-1. Simplified Process Flow Diagram

Permitting History

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

November 10, 2015	P-2015.0018, Initial permit to construct, Permit status (A, but will become S upon issuance of this permit)

Application Scope

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

The applicant has proposed to:

- Install and operate an additional emergency engine;
- Increase the biogas generation from the anaerobic digester;
- Increase the amount of biogas routed to the boilers and flare;
- Relocate the biogas flare.

Application Chronology

November 13, 2015	DEQ received an application and an application fee.
November 23 – December 8, 2015	DEQ provided an opportunity to request a public comment period on the application and proposed permitting action.
December 11, 2015	DEQ determined that the application was incomplete.
December 9, 2015	DEQ received supplemental information from the applicant.
January 8, 2016	DEQ determined that the application was complete.
March 2, 2016	DEQ made available the draft permit and statement of basis for peer and regional office review.
March 7, 2016	DEQ made available the draft permit and statement of basis for applicant review.
April 5, 2016	DEQ received the permit processing fee.
April 8, 2016	DEQ issued the final permit and statement of basis.

TECHNICAL ANALYSIS

Emissions Units and Control Equipment

Table 1 EMISSIONS UNIT AND CONTROL EQUIPMENT INFORMATION

Source ID No.	Sources	Control Equipment
Boiler 1	Boiler 1: Manufacturer: Cleaver-Brooks Model: 4WI-LN Rated Capacity: 29.8 MMBtu/hr input Fuel: Natural Gas	Low-NOx burners
Boiler 2	Boiler 2: Manufacturer: Cleaver-Brooks Model: 4WI-LN Rated Capacity: 29.8 MMBtu/hr input Fuel: Natural Gas	Low-NOx burners
Boiler 3	Boiler 3: Manufacturer: Cleaver-Brooks Model: 4WI-LN Rated Capacity: 30.1 MMBtu/hr input Fuel: Natural Gas and Biogas	Low-NOx burners Iron Sponge when combusting biogas
Boiler 4	Boiler 4: Manufacturer: Cleaver-Brooks Model: 4WI-LN Rated Capacity: 30.1 MMBtu/hr input Fuel: Natural Gas and Biogas	Low-NOx burners Iron Sponge when combusting biogas
Anaerobic Digester	Anaerobic Digester Biogas generation capacity of 450,000 scf/day	Iron Sponge (used when combusted in the boilers) 75% efficient Biogas Flare: Rated Capacity: 450,000 cf/day Fuel: Biogas
Air Make-Up Units	Several Air Make-Up Units: Total Firing Rate: 92.50 MMBtu/hr input Fuel: Natural Gas	Low-NO_x burners Three Air Make-Up Units in the rendering plant will be vented through Packed Bed Scrubber No. 3 and Packed Bed Scrubber No. 4
Truck Shop Heaters	Hot Water Heater: Rated Capacity: 0.66 MMBtu/hr input Fuel: Natural Gas Hot Water Heater: Rated Capacity: 0.26 MMBtu/hr input Fuel: Natural Gas	None
Rendering Equipment	Continuous Cooker: Manufacturer: DUPPS Model: 260U Max. production: 4.25 dry T/hr Fuel: Steam	Venturi Scrubber No. 1 (VS1): Manufacturer: Robertson Technologies Model: RT-VS-12K Pressure Drop: Not less than 4 inches $PM_{2.5}$ Control Eff: 85%

Source ID No.	Sources	Control Equipment
Rendering Equipment	Blood Dryer: Manufacturer: Uzelac Industries Model: DUSKE TPD-1500 Rated Capacity: 4.6 MMBtu/hr input Max. production: 0.59 dry T/hr Fuel: Natural Gas Meat and Bone Meal Handling	Venturi Scrubber No. 2 (VS2): Manufacturer: Robertson Technologies Model: RT-VS-12K Pressure Drop: Not less than 4 inches $PM_{2.5}$ Control Eff: 85% Venturi Scrubber No. 3 (VS3): Manufacturer: Robertson Technologies Model: RT-VS-20K Pressure Drop: Not less than 4 inches $PM_{2.5}$ Control Eff: 85% Packed Bed Scrubber No. 1 (PBS1): Manufacturer: Robertson Technologies Model: RT-BPS-12K/5 Air Flow: 12,000 scfm Pressure Drop: Not less than 6 inches Odor Control Eff: 85% Packed Bed Scrubber No. 2 (PBS2): Manufacturer: Robertson Technologies Model: RT-BPS-12K/5 Air Flow: 12,000 scfm Pressure Drop: Not less than 6 inches Odor Control Eff: 85% Packed Bed Scrubber No. 3 (PBS3): Manufacturer: Robertson Technologies Model: RT-BPS-75K/12 Air Flow: 75,000 scfm Pressure Drop: Not less than 6 inches Odor Control Eff: 85% Packed Bed Scrubber No. 4 (PBS4): Manufacturer: Robertson Technologies Model: RT-BPS-75K/12 Air Flow: 75,000 scfm Pressure Drop: Not less than 6 inches Odor Control Eff: 85%
Emergency Engines	Two Emergency Engines: Manufacturer: Generac Model: G100LG4 Capacity: 149 bhp Fuel: Natural Gas	None
Salt Storage Bin	Salt Bin Vent Filter: Capacity: 400 cfm	Bin Vent Filter

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 four natural gas-fired boilers, several natural gas-fired make-up air units, biogas flare, truck shop heaters, rendering equipment, emergency engines, and salt bin vent filter at the facility (see Appendix A) associated with this proposed project. Emissions estimates of criteria pollutant, greenhouse gases (GHG), hazardous air pollutants (HAP), and toxic air pollutants (TAP) were based on emission factors from AP-42, vendor information, operation of 8,760 hours per year, and process information specific to the facility for this proposed project.

Pre-Project Potential to Emit

The following table presents the pre-project potential to emit for all criteria and GHG 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 2 PRE-PROJECT POTENTIAL TO EMIT FOR REGULATED AIR POLLUTANTS

Source	$PM_{10}/PM_{2.5}$		SO_2		NO_X		CO		VOC		CO_2e	
	lb/hr[a]	T/yr[b]	lb/hr[a]	T/yr[b]	lb/hr[a]	T/yr[b]	lb/hr[a]	T/yr[b]	lb/hr[a]	T/yr[b]	lb/hr[a]	T/yr[b]
Boiler #1	0.22	0.97	0.02	0.08	1.04	4.57	1.12	4.90	0.16	0.70	3487	15275
Boiler #2	0.22	0.97	0.02	0.08	1.04	4.57	1.12	4.90	0.16	0.70	3487	15275
Boiler #3	0.38	1.65	0.07	0.29	1.21	5.30	1.23	5.38	0.16	0.71	6239	27329
Boiler #4	0.38	1.65	0.07	0.29	1.21	5.30	1.23	5.38	0.16	0.71	6239	27329
Biogas Flare	0.02	0.07	2.46	10.77	0.15	0.67	0.83	3.63	0.31	1.37	464	2034
Air Make-Up Units	0.69	3.02	0.05	0.24	4.49	19.68	3.42	14.98	0.50	2.18	10823	47407
Truck Shop Heaters	0.01	0.03	0.001	0.002	0.09	0.39	0.08	0.33	0.005	0.02	107	470
Rendering Equipment	1.01	4.43	0.00	0.01	0.16	0.69	1.35	5.91	0.77	3.37	527	2306
Emergency Engine	0.01	0.0006	0.0007	0.00003	0.66	0.03	1.32	0.07	0.32	0.02	133	7
Salt Storage Bin	0.02	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0
Pre-Project Totals	**2.96**	**12.87**	**2.69**	**11.76**	**10.05**	**41.20**	**11.70**	**45.48**	**2.55**	**9.78**	**31506**	**137432**

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

Post Project Potential to Emit

Post project Potential to Emit is used to establish the change in emissions at a facility and to determine the facility's classification as a result of this project. Post project Potential to Emit includes all permit limits resulting from this project.

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

Table 3 POST PROJECT POTENTIAL TO EMIT FOR REGULATED AIR POLLUTANTS

Source	$PM_{10}/PM_{2.5}$		SO_2		NO_X		CO		VOC		CO_2e	
	lb/hr[a]	T/yr[b]	lb/hr[a]	T/yr[b]	lb/hr[a]	T/yr[b]	lb/hr[a]	T/yr[b]	lb/hr[a]	T/yr[b]	lb/hr[a]	T/yr[b]
Boiler #1	0.22	0.97	0.02	0.08	1.04	4.57	1.12	4.90	0.16	0.70	3487	15275
Boiler #2	0.22	0.97	0.02	0.08	1.04	4.57	1.12	4.90	0.16	0.70	3487	15275
Boiler #3	0.38	1.65	2.78	12.16	1.21	5.30	1.23	5.38	0.16	0.71	6239	27329
Boiler #4	0.38	1.65	2.78	12.16	1.21	5.30	1.23	5.38	0.16	0.71	6239	27329
Biogas Flare	0.08	0.30	11.1	48.4	0.7	3.0	3.7	16.3	1.4	6.2	2089	9151
Air Make-Up Units	0.69	3.02	0.05	0.24	4.49	19.68	3.42	14.98	0.50	2.18	10823	47407
Truck Shop Heaters	0.01	0.03	0.001	0.002	0.09	0.39	0.08	0.33	0.005	0.02	107	470
Rendering Equipment	1.01	4.43	0.00	0.01	0.16	0.69	1.35	5.91	0.77	3.37	527	2306
Two Emergency Engines	0.02	0.001	0.001	0.00007	1.32	0.07	2.65	0.13	0.64	0.03	266	13
Salt Storage Bin	0.02	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0
Post Project Totals	**3.03**	**13.10**	**16.75**	**73.13**	**11.26**	**43.57**	**15.90**	**58.21**	**3.96**	**14.62**	**33264**	**144555**

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

Change in Potential to Emit

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

Table 4 CHANGES IN POTENTIAL TO EMIT FOR REGULATED AIR POLLUTANTS

Source	$PM_{10}/PM_{2.5}$		SO_2		NO_X		CO		VOC		CO_2e	
	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-Project Potential to Emit	2.96	12.87	2.69	11.76	10.05	41.20	11.70	45.48	2.55	9.78	31506	137432
Post Project Potential to Emit	3.03	13.10	16.75	73.13	11.26	43.57	15.90	58.21	3.96	14.62	33264	144555
Changes in Potential to Emit	**0.07**	**0.23**	**14.06**	**61.37**	**1.21**	**2.37**	**4.20**	**12.73**	**1.41**	**4.84**	**1758.00**	**7123.00**

Non-Carcinogenic TAP Emissions

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

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

Table 5 PRE- AND POST PROJECT POTENTIAL TO EMIT FOR NON-CARCINOGENIC TOXIC AIR POLLUTANTS

Non-Carcinogenic Toxic Air Pollutants	Pre-Project 24-hour Average Emissions Rates for Units at the Facility (lb/hr)	Post Project 24-hour Average Emissions Rates for Units at the Facility (lb/hr)	Change in 24-hour Average Emissions Rates for Units at the Facility (lb/hr)	Non-Carcinogenic Screening Emission Level (lb/hr)	Exceeds Screening Level? (Y/N)
1,2,3-Trimethylbenzene	0.00E-03	5.24E-05	5.24E-05	8.2	No
1,2,4-Trimethylbenzene	0.00E-03	3.26E-05	3.26E-05	8.2	No
1,3,5-Trimethylbenzene	0.00E-03	7.70E-05	7.70E-05	8.2	No
2,2,4-Trimethylpentane	0.00E-03	5.69E-05	5.69E-05	23.3	No
Acrolein	1.82E-03	3.64E-03	1.82E-03	1.7E-02	No
Ammonia	3.51E-01	3.51E-01	0.00	1.2	No
Biphenyl	2.41E-04	4.83E-04	2.41E-04	0.1	No
Cyclopentane	2.58E-04	5.17E-04	2.58E-04	114.7	No
Dichlorobenzene	2.56E-04	2.56E-04	0.00	30.0	No
Ethylbenzene	4.52E-05	9.04E-05	4.52E-05	29.0	No
Hexane	3.86E-01	3.86E-01	0.00	12.0	No
Hydrogen Sulfide	4.68E-02	4.68E-02	0.00	0.9	No
Methanol	2.85E-03	5.69E-03	2.85E-03	17.3	No
Methylcyclohexane	1.40E-03	2.80E-03	1.40E-03	107.0	No
n-Nonane	1.25E-04	2.50E-04	1.25E-04	70.0	No
n-Octane	4.00E-04	7.99E-04	4.00E-04	93.3	No
Nitrous Oxide	4.70E-01	4.70E-01	0.00	6.0	No
Naphthalene	2.66E-04	4.03E-04	2.66E-04	3.3	No
Pentane	5.58E-01	5.61E-01	0.003	118.0	No
Phenol	2.73E-05	5.46E-05	2.73E-05	1.27	No
Toluene	1.19E-03	1.65E-03	4.6E-02	25.0	No
Barium	9.39E-04	9.39E-04	0.00	3.3E-02	No
Chromium-Total	2.99E-04	2.99E-04	0.00	3.3E-02	No
Chromium III	2.87E-04	2.87E-04	0.00	3.3E-02	No
Cobalt	1.79E-05	1.79E-05	0.00	3.3E-03	No
Copper	1.81E-04	1.81E-04	0.00	6.7E-02	No
Manganese	8.11E-05	8.11E-05	0.00	0.333	No
Molybdenum	2.35E-04	2.35E-04	0.00	0.333	No
Selenium	5.12E-06	5.12E-06	0.00	1.3E-02	No
Xylene	1.51E-04	3.03E-04	1.51E-04	29.0	No
Zinc	6.19E-03	6.19E-03	0.00	0.667	No

None of the PTEs for non-carcinogenic TAP were exceeded as a result of this project. Although modeling is not required for any non-carcinogenic TAP because none of the 24-hour average carcinogenic screening ELs identified in IDAPA 58.01.01.585 were exceeded, modeling was performed facility wide.

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

Carcinogenic Toxic Air Pollutants	Pre-Project Annual Average Emissions Rates for Units at the Facility (lb/hr)	Post Project Annual Average Emissions Rates for Units at the Facility (lb/hr)	Change in Annual Average Emissions Rates for Units at the Facility (lb/hr)	Carcinogenic Screening Emission Level (lb/hr)	Exceeds Screening Level? (Y/N)
1,1,2,2-Tetrachloroethane	3.22E-08	6.45E-08	3.22E-08	1.1E-05	No
1,2-Butadiene	3.47E-06	6.94E-06	3.47E-06	2.4E-05	No
3-Methylchloranthrene	3.84E-07	3.84E-07	0.00	2.5E-06	No
Acenaphthene (PAH)	9.13E-09	1.83E-08	9.13E-09	9.1E-05	No
Acenaphthylene (PAH)	9.67E-08	1.93E-07	9.67E-08	9.1E-05	No
Acetaldehyde	5.08E-05	1.02E-04	5.08E-05	3.0E-03	No
Anthracene (PAH)	3.26E-09	6.52E-09	3.26E-09	9.1E-05	No
Benzene	4.64E-04	4.79E-04	1.50E-05	8.0E-04	No
Benzo(a)pyrene	2.57E-07	2.57E-07	0.00	2.0E-06	No
Benzo(e)pyrene (PAH)	5.39E-09	1.08E-08	5.39E-09	9.1E-05	No
Benzo(g,h,i)perylene (PAH)	1.31E-09	2.62E-09	1.31E-09	9.1E-05	No
Biphenyl (PAH)	2.75E-06	5.51E-06	2.75E-06	9.1E-05	No
Fluoranthene (PAH)	3.18E-09	6.37E-09	3.18E-09	9.1E-05	No
Fluorene (PAH)	5.86E-09	1.17E-08	5.86E-09	9.1E-05	No
Formaldehyde	1.64E-02	1.67E-02	3.00E-04	5.1E-04	No
Methylene Chloride	2.60E-07	5.20E-07	2.60E-07	1.6E-03	No
Naphthalene (PAH)	1.32E-04	1.33E-04	0.00	9.1E-05	No
Phenanthrene (PAH)	1.14E-08	2.28E-08	1.14E-08	9.1E-05	No
Pyrene (PAH)	1.57E-09	3.13E-09	1.57E-09	9.1E-05	No
Vinyl Chloride	1.94E-07	3.87E-07	1.94E-07	9.4E-04	No
Arsenic	4.27E-05	4.27E-05	0.00	1.5E-06	No
Beryllium	2.56E-06	2.56E-06	0.00	2.8E-05	No
Cadmium	2.35E-04	2.35E-04	0.00	3.7E-06	No
Chromium VI	1.20E-05	1.20E-05	0.00	5.6E-07	No
Nickel	4.48E-04	4.48E-04	0.00	2.7E-05	No

None of the PTEs for carcinogenic TAP were exceeded as a result of this project. Although modeling is not required for any carcinogenic TAP because none of the annual average carcinogenic screening ELs identified in IDAPA 58.01.01.586 were exceeded, modeling was performed facility wide.

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 7 HAZARDOUS AIR POLLUTANTS EMISSIONS POTENTIAL TO EMIT SUMMARY

Hazardous Air Pollutants	PTE (T/yr)
1,3-Butadiene	3.0E-05
2,2,4-Trimethylpentane	2.8E-05
Acenaphthene (PAH)	8.0E-08
Acenaphthylene (PAH)	8.5E-07
Actealdehyde	4.5E-04
Acrolein	1.8E-04
Anthracene (PAH)	2.9E-08
Benzo(e)pyrene (PAH)	4.7E-08
Benzo(g,h,i)perylene (PAH)	1.1E-08
Biphenyl (PAH)	2.4E-05
Dichlorobenzene	1.1E-03
Ethylbenzene	4.5E-06
Fluoranthene (PAH)	2.8E-08
Fluorene (PAH)	5.1E-08
Formaldehyde	7.2E-02
Hexane	1.7
Methanol	2.8E-04
Naphthalene	5.8E-04
Phenol	2.7E-06
Phenanthrene (PAH)	1.0E-07
Pyrene (PAH)	1.4E-08
Tetrachloroethane	2.8E-07
Toluene	3.2E-03
Vinyl Chloride	1.7E-06
Xylene	1.5E-05
Arsenic	1.9E-04
Beryllium	1.1E-05
Cadmium	1.0E-03
Chromium (Total)	1.3E-03
Cobalt	7.9E-05
Copper	7.9E-04
Manganese	3.6E-04
Mercury	2.4E-04
Selemium	2.2E-05
Polycyclic Organic Matter	1.1E-05
Totals	**1.77**

Ambient Air Quality Impact Analyses

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

The applicant has demonstrated pre-construction compliance to DEQ's satisfaction that emissions from this facility will not cause or significantly contribute to a violation of any ambient air quality standard. The applicant has also demonstrated pre-construction compliance to DEQ's satisfaction that the emissions increase due to this permitting action will not exceed any acceptable ambient concentration (AAC) or acceptable ambient concentration for carcinogens (AACC) for toxic air pollutants (TAP). A summary of the Ambient Air Impact Analysis for TAP is provided in Appendix A.

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

REGULATORY ANALYSIS

Attainment Designation (40 CFR 81.313)

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

Facility Classification

The facility will remain a minor source.

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 the modified emissions source. Therefore, a permit to construct is required to be issued in accordance with IDAPA 58.01.01.220. This permitting action was processed in accordance with the procedures of IDAPA 58.01.01.200-228.

Tier II Operating Permit (IDAPA 58.01.01.401)

IDAPA 58.01.01.401 .....Tier II Operating Permit

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

Visible Emissions (IDAPA 58.01.01.625)

IDAPA 58.01.01.625.....Visible Emissions

The sources of PM_{10} emissions at this facility are subject to the State of Idaho visible emissions standard of 20% opacity. This requirement is assured by Permit Condition 2.8.

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

Standards for New Sources (IDAPA 58.01.01.676)

IDAPA 58.01.01.676 ..... Standards for New Sources

The fuel burning equipment located at this facility, with a maximum rated input of ten (10) million BTU per hour or more, are subject to a particulate matter limitation of 0.015 gr/dscf of effluent gas corrected to 3% oxygen by volume when combusting gaseous fuels. Fuel-Burning Equipment is defined as any furnace, boiler, apparatus, stack and all appurtenances thereto, used in the process of burning fuel for the primary purpose of producing heat or power by indirect heat transfer. This requirement is assured by Permit Condition 4.3.

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 four 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 $\geq 9{,}250$ lb/hr; $E = 1.10\ (PW)^{0.25}$

For the new blood dryer emissions unit proposed to be installed as a result of this project with a proposed throughput of 8,500 lb/hr, E is calculated as follows:

Therefore, E is calculated as:

$E = 0.045 \times PW^{0.60} = 0.045 \times (8{,}500)^{0.60} = 10.25$ lb-PM/hr

For the new cooker emissions unit proposed to be installed as a result of this project with a proposed throughput of 1,170 lb/hr, E is calculated as follows:

Therefore, E is calculated as:

$E = 0.045 \times PW^{0.60} = 0.045 \times (1{,}170)^{0.60} = 3.12$ lb-PM/hr

As presented previously in the Emissions Inventories Section of this evaluation the post project PTE for the blood dryer and cooker is 1.01 lb-PM_{10}/hr. Assuming PM is 50% PM_{10} means that PM emissions will be 2.02 lb-PM/hr (1.01 lb-PM_{10}/hr ÷ 0.5 lb-PM_{10}/lb-PM). Therefore, compliance with this requirement has been demonstrated.

Rules for the Control of Rendering Plants (IDAPA 58.01.01.835)

IDAPA 58.01.01.835 ..... Rendering Plant Limitations on the Emission of Odors

IDAPA 58.01.01.836 through 838 sets standards for the control of cookers, expellers, and plant air and the odors that are emitted from these sources. The equipment located at this facility, including the cooker, drainer, presses, and centrifuge, are subject to these requirements that require that exhaust or ventilation air is ducted to odor control equipment. These requirements are assured by Permit Conditions 3.7 through 3.9.

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

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

Post project facility-wide emissions from this facility do not have a potential to emit greater than 100 tons per year for PM_{10}, $PM_{2.5}$, SO_2, NO_X, CO, and VOC or 10 tons per year for any one HAP or 25 tons per year for all HAP combined as demonstrated previously in the Emissions Inventories Section of this analysis. Therefore, the facility is not a Tier I source in accordance with IDAPA 58.01.01.006 and the requirements of IDAPA 58.01.01.301 do not apply.[2]

PSD Classification (40 CFR 52.21)

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

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

NSPS Applicability (40 CFR 60)

Because the facility has four boilers and two spark-ignited IC engines the following NSPS requirements apply to this facility:

- 40 CFR 60, Subpart Dc - Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units. DEQ is delegated this Subpart.
- 40 CFR 60, Subpart JJJJ – Standards of Performance for Stationary Spark Ignition Internal Combustion Engines. DEQ is delegated this Subpart.

40 CFR 60, Subpart Dc..... Standards of Performance for Small Industrial–Commercial–Institutional Steam Generating Units

All four boilers at this facility only combust natural gas or biogas as fuel as required by Permit Condition 4.3. Therefore, the only Sections of this subpart that are applicable to the four boilers at this facility are the Applicability and Delegation of Authority specified in § CFR 60.40c(a), the Recordkeeping requirements of § CFR 60.48c (g), (i), and (j), and the Reporting requirements of § CFR 60.48c(a), (a)(1), and (a)(3).

§ 60.40c Applicability and delegation of authority.

(a) Except as provided in paragraphs (d), (e), (f), and (g) of this section, the affected facility to which this subpart applies is each steam generating unit for which construction, modification, or reconstruction is commenced after June 9, 1989 and that has a maximum design heat input capacity of 29 megawatts (MW) (100 million British thermal units per hour (MMBtu/h)) or less, but greater than or equal to 2.9 MW (10 MMBtu/h).

(b) In delegating implementation and enforcement authority to a State under section 111(c) of the Clean Air Act, §60.48c(a)(4) shall be retained by the Administrator and not transferred to a State.

(c) Steam generating units that meet the applicability requirements in paragraph (a) of this section are not subject to the sulfur dioxide (SO_2) or particulate matter (PM) emission limits, performance testing requirements, or

[2] Following the recent court decision in Utility Air Regulatory Group (UARG) v. Environmental Protection Agency (EPA), EPA has indicated that it will no longer apply or enforce federal regulatory provisions of the EPA-approved Title V programs that require a stationary source to obtain a PSD or Title V permit solely because the source emits or has the potential to emit greenhouse gas (GHG) emissions above the major source thresholds ("Step 2" sources). The State of Idaho incorporates the T1 program definition of "major facility" at IDAPA 58.01.01.008.10.d, in accordance with 40 CFR 70.2. In order to act consistent with our understanding of EPA's memorandum and the Supreme Court's decision, DEQ will no longer require PSD or T1 permits for "Step 2" sources, and will not continue processing applications for such permits. DEQ and EPA recognize that Idaho's SIP-approved regulations may require revision to effectuate the Supreme Court's decision.

monitoring requirements under this subpart (§§60.42c, 60.43c, 60.44c, 60.45c, 60.46c, or 60.47c) during periods of combustion research, as defined in §60.41c.

The four natural gas-fired or biogas boilers are rated at 30 MMBtu/hr and were constructed after June 9, 1989. Therefore, these four boilers are subject to some of the requirements of this subpart.

§ 60.41c Definitions.

The definitions of this section apply to the four boilers at this facility.

§ 60.48c Reporting and recordkeeping requirements.

(a) The owner or operator of each affected facility shall submit notification of the date of construction or reconstruction and actual startup, as provided by §60.7 of this part. This notification shall include:

(1) The design heat input capacity of the affected facility and identification of fuels to be combusted in the affected facility.

(3) The annual capacity factor at which the owner or operator anticipates operating the affected facility based on all fuels fired and based on each individual fuel fired.

(g)(1) Except as provided under paragraphs (g)(2) and (g)(3) of this section, the owner or operator of each affected facility shall record and maintain records of the amount of each fuel combusted during each operating day.

(2) As an alternative to meeting the requirements of paragraph (g)(1) of this section, the owner or operator of an affected facility that combusts only natural gas, wood, fuels using fuel certification in §60.48c(f) to demonstrate compliance with the SO_2 standard, fuels not subject to an emissions standard (excluding opacity), or a mixture of these fuels may elect to record and maintain records of the amount of each fuel combusted during each calendar month.

(i) All records required under this section shall be maintained by the owner or operator of the affected facility for a period of two years following the date of such record.

(j) The reporting period for the reports required under this subpart is each six-month period. All reports shall be submitted to the Administrator and shall be postmarked by the 30th day following the end of the reporting period.

The facility shall submit a notification of the date of construction and actual startup as provided above. The facility shall also record and maintain records of fuel combusted during each operating day for a period of two years following the date of record. The reports shall be submitted for a six month period.

40 CFR 60, Subpart JJJJ.....Standards of Performance for Stationary Spark Internal Combustion Engines

§ 60.4230 Am I subject to this subpart?

(a) The provisions of this subpart are applicable to manufacturers, owners, and operators of stationary spark ignition (SI) internal combustion engines (ICE) as specified in paragraphs (a)(1) through (6) of this section. For the purposes of this subpart, the date that construction commences is the date the engine is ordered by the owner or operator.

(4) Owners and operators of stationary SI ICE that commence construction after June 12, 2006, where the stationary SI ICE are manufactured:

(iii) on or after July 1, 2008, for engines with a maximum engine power less than 500 HP; or

(6) The provisions of §60.4236 of this subpart are applicable to all owners and operators of stationary SI ICE that commence construction after June 12, 2006.

The proposed engine is a stationary spark ignition engine that will commence construction after June 12, 2006. The proposed engine will have a power rating of less than 500 HP. Therefore the engine is subject to the Subpart.

§60.4233 What emission standards must I meet if I am an owner or operator of a stationary SI internal combustion engine?

(e) Owners and operators of stationary SI ICE with a maximum engine power greater than or equal to 75 KW (100 HP) (except gasoline and rich burn engines that use LPG) must comply with the emission standards in Table 1 to this subpart for their stationary SI ICE. For owners and operators of stationary SI ICE with a maximum engine power greater than or equal to 100 HP (except gasoline and rich burn engines that use LPG) manufactured prior to January 1, 2011 that were certified to the certification emission standards in 40 CFR part 1048 applicable to engines that are not severe duty engines, if such stationary SI ICE was certified to a carbon monoxide (CO) standard above the standard in Table 1 to this subpart, then the owners and operators may meet the CO certification (not field testing) standard for which the engine was certified.

Table 1 to Subpart JJJJ of Part 60—NO_x, CO, and VOC Emission Standards for Stationary Non-Emergency SI Engines ≥100 HP (Except Gasoline and Rich Burn LPG), Stationary SI Landfill/Digester Gas Engines, and Stationary Emergency Engines >25 HP

Engine type and fuel	Maximum engine power	Manufacture date	Emission standards[a]					
			g/HP-hr			ppmvd at 15% O_2		
			NO_X	CO	VOC[d]	NO_X	CO	VOC[d]
Emergency	HP≥130		2.0	4.0	1.0	160	540	86

[a]Owners and operators of stationary non-certified SI engines may choose to comply with he emission standards in units of either g/HP-hr or ppmvd at 15 percent O_2.

[b]Owners and operators of new or reconstructed non-emergency lean bum SI stationary engines with a site rating of greater than or equal to 250 brake HP located at a major source that are meeting the requirements of 40 CFR part 63, subpart ZZZZ, Table 2a do not have to comply with the CO emission standards of Table 1 of this subpart.

[c]The emission standards applicable to emergency engines between 25 HP and 130 HP are in terms of NO_X + HC.

[d]For purposes of this subpart, when calculating emissions of volatile organic compounds, emissions of formaldehyde should not be included.

§60.4234 How long must I meet the emission standards if I am an owner or operator of a stationary SI internal combustion engine?

Owners and operators of stationary SI ICE must operate and maintain stationary SI ICE that achieve the emission standards as required in §60.4233 over the entire life of the engine.

The proposed engine must meet the emission standards over the entire life of the engine.

§60.4237 What are the monitoring requirements if I am an owner or operator of an emergency stationary SI internal combustion engine?

(b) Starting on January 1, 2011, if the emergency stationary SI internal combustion engine that is greater than or equal to 130 HP and less than 500 HP that was built on or after January 1, 2011, does not meet the standards applicable to non-emergency engines, the owner or operator must install a non-resettable hour meter.

The permittee shall install a non-resettable hour meter on the emergency engine.

§60.4243 What are my compliance requirements if I am an owner or operator of a stationary SI internal combustion engine?

(a) If you are an owner or operator of a stationary SI internal combustion engine that is manufactured after July 1, 2008, and must comply with the emission standards specified in §60.4233(a) through (c), you must comply by purchasing an engine certified to the emission standards in §60.4231(a) through (c), as applicable, for the same engine class and maximum engine power. In addition, you must meet one of the requirements specified in (a)(1) and (2) of this section.

(1) If you operate and maintain the certified stationary SI internal combustion engine and control device according to the manufacturer's emission-related written instructions, you must keep records of conducted maintenance to demonstrate compliance, but no performance testing is required if you are an owner or operator. You must also meet the requirements as specified in 40 CFR part 1068, subparts A through D, as they apply to you. If you adjust engine settings according to and consistent with the manufacturer's instructions, your stationary SI internal combustion engine will not be considered out of compliance.

The permittee has stated they will purchase a certified engine. The permittee shall operate and maintain the engine according to the manufacturer's instructions and keep records of any engine maintenance.

(b) If you are an owner or operator of a stationary SI internal combustion engine and must comply with the emission standards specified in §60.4233(d) or (e), you must demonstrate compliance according to one of the methods specified in paragraphs (b)(1) and (2) of this section.

(1) Purchasing an engine certified according to procedures specified in this subpart, for the same model year and demonstrating compliance according to one of the methods specified in paragraph (a) of this section.

The permittee has stated they will purchase a certified engine.

(d) If you own or operate an emergency stationary ICE, you must operate the emergency stationary ICE according to the requirements in paragraphs (d)(1) through (3) of this section. In order for the engine to be considered an emergency stationary ICE under this subpart, any operation other than emergency operation, maintenance and testing, emergency demand response, and operation in non-emergency situations for 50 hours per year, as described in paragraphs (d)(1) through (3) of this section, is prohibited. If you do not operate the engine according to the requirements in paragraphs (d)(1) through (3) of this section, the engine will not be considered an emergency engine under this subpart and must meet all requirements for non-emergency engines.

(1) There is no time limit on the use of emergency stationary ICE in emergency situations.

(2) You may operate your emergency stationary ICE for any combination of the purposes specified in paragraphs (d)(2)(i) through (iii) of this section for a maximum of 100 hours per calendar year. Any operation for non-emergency situations as allowed by paragraph (d)(3) of this section counts as part of the 100 hours per calendar year allowed by this paragraph (d)(2).

(i) Emergency stationary ICE may be operated for maintenance checks and readiness testing, provided that the tests are recommended by federal, state or local government, the manufacturer, the vendor, the regional transmission organization or equivalent balancing authority and transmission operator, or the insurance company associated with the engine. The owner or operator may petition the Administrator for approval of additional hours to be used for maintenance checks and readiness testing, but a petition is not required if the owner or operator maintains records indicating that federal, state, or local standards require maintenance and testing of emergency ICE beyond 100 hours per calendar year.

(ii) Emergency stationary ICE may be operated for emergency demand response for periods in which the Reliability Coordinator under the North American Electric Reliability Corporation (NERC) Reliability Standard EOP-002-3, Capacity and Energy Emergencies (incorporated by reference, see §60.17), or other authorized entity as determined by the Reliability Coordinator, has declared an Energy Emergency Alert Level 2 as defined in the NERC Reliability Standard EOP-002-3.

(iii) Emergency stationary ICE may be operated for periods where there is a deviation of voltage or frequency of 5 percent or greater below standard voltage or frequency.

(3) Emergency stationary ICE may be operated for up to 50 hours per calendar year in non-emergency situations. The 50 hours of operation in non-emergency situations are counted as part of the 100 hours per calendar year for maintenance and testing and emergency demand response provided in paragraph (d)(2) of this section. Except as provided in paragraph (d)(3)(i) of this section, the 50 hours per year for non-emergency situations cannot be used for peak shaving or non-emergency demand response, or to generate income for a facility to an electric grid or otherwise supply power as part of a financial arrangement with another entity.

The permittee shall limit non-emergency use of the engine to 100 hours per year for maintenance and testing.

§60.4245 What are my notification, reporting, and recordkeeping requirements if I am an owner or operator of a stationary SI internal combustion engine?

Owners or operators of stationary SI ICE must meet the following notification, reporting and recordkeeping requirements.

(a) Owners and operators of all stationary SI ICE must keep records of the information in paragraphs (a)(1) through (4) of this section.

(1) All notifications submitted to comply with this subpart and all documentation supporting any notification.

(2) Maintenance conducted on the engine.

(3) If the stationary SI internal combustion engine is a certified engine, documentation from the manufacturer that the engine is certified to meet the emission standards and information as required in 40 CFR parts 90, 1048, 1054, and 1060, as applicable.

The permittee shall keep comply with the requirements above.

(b) For all stationary SI emergency ICE greater than or equal to 500 HP manufactured on or after July 1, 2010, that do not meet the standards applicable to non-emergency engines, the owner or operator of must keep records of the hours of operation of the engine that is recorded through the non-resettable hour meter. For all stationary SI emergency ICE greater than or equal to 130 HP and less than 500 HP manufactured on or after July 1, 2011 that do not meet the standards applicable to non-emergency engines, the owner or operator of must keep records of the hours of operation of the engine that is recorded through the non-resettable hour meter. For all stationary SI emergency ICE greater than 25 HP and less than 130 HP manufactured on or after July 1, 2008, that do not meet the standards applicable to non-emergency engines, the owner or operator of must keep records of the hours of operation of the engine that is recorded through the non-resettable hour meter. The owner or operator must document how many hours are spent for emergency operation, including what classified the operation as emergency and how many hours are spent for non-emergency operation.

The permittee shall keep records of the hours of operation of the engine, including hours spent for emergency operation and hours spent for non-emergency operation.

NESHAP Applicability (40 CFR 61)

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

MACT Applicability (40 CFR 63)

The facility has proposed to operate as a minor source of hazardous air pollutant (HAP) emissions, and is subject to the requirements of 40 CFR 63, Subpart ZZZZ–National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines. DEQ is delegated this Subpart.

40 CFR 63, Subpart ZZZZ..... National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines

§63.6585 Am I subject to this subpart?

You are subject to this subpart if you own or operate a stationary RICE at a major or area source of HAP emissions, except if the stationary RICE is being tested at a stationary RICE test cell/stand.

The proposed engine is a stationary RICE at an area source of HAP emissions.

§63.6590 What parts of my plant does this subpart cover?

(2) New stationary RICE. (iii) A stationary RICE located at an area source of HAP emissions is new if you commenced construction of the stationary RICE on or after June 12, 2006.

The proposed engine is a new stationary RICE at an area source of HAP emissions.

(c) Stationary RICE subject to Regulations under 40 CFR Part 60. An affected source that meets any of the criteria in paragraphs (c)(1) through (7) of this section must meet the requirements of this part by meeting the requirements of 40 CFR part 60 subpart IIII, for compression ignition engines or 40 CFR part 60 subpart JJJJ, for spark ignition engines. No further requirements apply for such engines under this part.

(1) A new or reconstructed stationary RICE located at an area source;

The proposed engine is subject to the requirements of 40 CFR Part 60 Subpart JJJJ and therefore no further requirements apply to the engine under Subpart ZZZZ.

Permit Conditions Review

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

Permit Condition 1.1 was revised to explain the revisions being made to the initial PTC.

Permit Condition 1.3 was added to indicate the PTC being replaced.

Table 1.1 was revised to include the additional emergency engine.

Permit Conditions 5.1 through 5.10 were revised to include the additional emergency engine.

Permit Condition 6.1 was revised to increase the biogas generation to 450,000 cubic feet per day and decrease the minimum H_2S removal efficiency of the iron sponge to 75 percent.

Table 6.1 was revised to increase the biogas generation of the anaerobic digester to 450,000 cubic feet per day.

Permit Condition 6.6 was revised to limit the biogas combusted to 450,000 cubic feet per day.

PUBLIC REVIEW

Public Comment Opportunity

An opportunity for public comment period on the application was provided in accordance with IDAPA 58.01.01.209.01.c or IDAPA 58.01.01.404.01.c. During this time, there 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

CS Beef Packing Plant - Kuna, ID

Boiler 1

- Natural Gas Only

	Boiler Specifications	
Operating hours	8,760 hours/year	
Firing rate	29.81 MMBtu/hr	HHV
Stack Exhaust Flow Information		
F Factor (Natural Gas)	8,710 dscf/MMBtu	Source: EPA Method 19
Exhaust gas volume flow	4,327 dscfm @ 0%O2	
Exhaust gas volume flow - corrected	5,052 dscfm @ 3%O2	Corrected to 3% O2
Exhaust Temperature	508 F	
Exit Velocity	53.6 ft/s	
Exit Diameter	2.0 ft	
Exhaust gas volume - estimated actual	10,102 acfm	based on expected operating conditions

Criteria and PSD Pollutant Emissions

Pollutant	Emission Factor lb/MMBtu	Emission Rate [e] lb/hr	tpy
NOx [a]	0.0350	1.04	4.57
CO [a]	0.0375	1.12	4.90
SO2 [b]	0.0006	0.018	0.08
PM10 (Filt. & Cond.) [b]	0.0075	0.222	0.97
PM2.5 (Filt.& Cond.) [b]	0.0075	0.222	0.97
VOC [b]	0.0054	0.161	0.70
Lead [b]	4.9E-07	1.5E-05	6.4E-05
CO2 [c]	117	3,484	15,260
CH4 [c]	2.2E-03	6.6E-02	2.9E-01
N2O [c]	2.2E-04	6.6E-03	2.9E-02
CO2e [d]		3,487	15,275

notes:

a - NOx and CO emissions based on 30 ppmv and 50 ppmv, respectively (vendor

b - Emission factors based on AP-42, Section 1.4 (Natural Gas Combustion) corrected to lb/mmBtu using natural gas heat content (1,020 btu/cf).

c - Greenhouse Gas emission factors from 40 CFR 98, Subpart C, Table C-1.

d - CO2e calculated based on global warming potential (GWP) for each Greenhouse gas: CO2 = 1; CH4 = 25; and N2O = 298 (40 CFR Part 98, Subpart A).

e - Hourly emissions based on 29.8 MMBtu/hr, and annual emissions based on 8,760 hrs/yr.

CS Beef Packing Plant - Kuna, ID

Boiler 1

- Natural Gas Only

Toxic Air Pollutant Emissions

CAS	Compound	Emission Factor [a] lb/mmscf	Emission Factor [a] lb/mmBtu	Emission Rate [d] lb/hr	Emission Rate [d] lb/yr
7440-38-2	Arsenic	2.0E-04	2.0E-07	5.8E-06	0.05
7440-39-3	Barium	4.4E-03	4.3E-06	1.3E-04	1.1
71-43-2	Benzene	2.1E-03	2.1E-06	6.1E-05	0.5
7440-41-7	Beryllium	1.2E-05	1.2E-08	3.5E-07	0.003
7440-43-9	Cadmium	1.1E-03	1.1E-06	3.2E-05	0.3
7440-47-3_Cr	Chromium-Total [b]	1.4E-03	1.4E-06	4.1E-05	0.4
7440-47-3_CrIII	Chromium III	1.3E-03	1.3E-06	3.9E-05	0.3
7440-47-3_CrVI	Chromium VI	5.6E-05	5.5E-08	1.6E-06	0.014
7440-48-4	Cobalt	8.4E-05	8.2E-08	2.5E-06	0.02
7440-50-8	Copper	8.5E-04	8.3E-07	2.5E-05	0.2
50-00-0	Formaldehyde	7.5E-02	7.4E-05	2.2E-03	19
110-54-3	Hexane	1.8E+00	1.8E-03	5.3E-02	461
7439-96-5	Manganese	3.8E-04	3.7E-07	1.1E-05	0.10
7439-97-6	Mercury	2.6E-04	2.5E-07	7.6E-06	0.07
7439-98-7	Molybdenum	1.1E-03	1.1E-06	3.2E-05	0.3
91-20-3	Naphthalene	6.1E-04	6.0E-07	1.8E-05	0.2
7440-02-0	Nickel	2.1E-03	2.1E-06	6.1E-05	0.5
109-66-0	Pentane	2.6E+00	2.5E-03	7.6E-02	666
7782-49-2	Selenium	2.4E-05	2.4E-08	7.0E-07	0.006
108-88-3	Toluene	3.4E-03	3.3E-06	9.9E-05	0.9
10024-97-2	Nitrous Oxide	2.2E+00	2.2E-03	6.4E-02	563
56-55-3	Benz(a)anthracene	1.8E-06	1.8E-09	5.3E-08	0.0005
50-32-8	Benzo(a)pyrene	1.2E-06	1.2E-09	3.5E-08	0.0003
205-99-2	Benzo(b)fluoranthene	1.8E-06	1.8E-09	5.3E-08	0.0005
207-08-9	Benzo(k)fluoranthene	1.8E-06	1.8E-09	5.3E-08	0.0005
218-01-9	Chrysene	1.8E-06	1.8E-09	5.3E-08	0.0005
53-70-3	Dibenzo(a,h)anthrancene	1.2E-06	1.2E-09	3.5E-08	0.0003
193-39-5	Indeno(1,2,3-cd)pyrene	1.8E-06	1.8E-09	5.3E-08	0.0005
56-49-5	3-Methylchloranthrene	1.8E-06	1.8E-09	5.3E-08	0.0005
23521-22-6	Dichlorobenzene	1.2E-03	1.2E-06	3.5E-05	0.3
7440-66-6	Zinc	2.9E-02	2.8E-05	8.5E-04	7
PAH	PAH (total) [c]	-	-	3.33E-07	0.003

notes:

a - All other HAP and TAP emission factors based on AP-42, Section 1.4 (Natural Gas Combustion) corrected to lb/mmBtu using natural gas heat content (1,020 btu/cf).

b - AP-42 provides a chromium emission factor for natural gas fired external combustion, but does not include guidance for partitioning emissions between the carcinogenic chromium VI (hexavalent chromium) and the chromium III (trivalent chromium). EPA's 2002 National-Scale Air Toxics Assessment (NATA) released June 2009 includes a chromium speciation profile for natural gas-fired boilers, which indicates 4 percent of total chromium is chromium VI and 96 percent is chromium III. ENVIRON assumed 4 percent of total chromium emissions were emitted as chromium VI.

c - (Polycyclic Organic Matter) For emissions of PAH mixtures, the following PAHs and shall be considered together as one TAP, equivalent in potency to benzo(a)pyrene: benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, dibenzo(a,h)anthracene, chrysene, indenol(1,2,3,-cd)pyrene, benzo(a)pyrene.

d - Hourly emissions based on 29.8 MMBtu/hr and annual emissions based on 8,760 hrs/yr.

CS Beef Packing Plant - Kuna, ID

Boiler 2

- Natural Gas Only

	Boiler Specifications	
Operating hours	8,760 hours/year	
Firing rate	29.81 MMBtu/hr	HHV
Stack Exhaust Flow Information		
F Factor (Natural Gas)	8,710 dscf/MMBtu	Source: EPA Method 19
Exhaust gas volume flow	4,327 dscfm @ 0%O2	
Exhaust gas volume flow - corrected	5,052 dscfm @ 3%O2	Corrected to 3% O2
Exhaust Temperature	508 F	
Exit Velocity	53.6 ft/s	
Exit Diameter	2.0 ft	
Exhaust gas volume - estimated actual	10,102 acfm	based on expected operating conditions

Criteria and PSD Pollutant Emissions

Pollutant	Emission Factor lb/MMBtu	Emission Rate [e] lb/hr	tpy
NOx [a]	0.0350	1.04	4.57
CO [a]	0.0375	1.12	4.90
SO2 [b]	0.0006	0.018	0.08
PM10 (Filt. & Cond.) [b]	0.0075	0.222	0.97
PM2.5 (Filt.& Cond.) [b]	0.0075	0.222	0.97
VOC [b]	0.0054	0.161	0.70
Lead [b]	4.9E-07	1.5E-05	6.4E-05
CO2 [c]	117	3,484	15,260
CH4 [c]	2.2E-03	6.6E-02	2.9E-01
N2O [c]	2.2E-04	6.6E-03	2.9E-02
CO2e [d]		3,487	15,275

notes:

a - NOx and CO emissions based on 30 ppmv and 50 ppmv, respectively (vendor

b - Emission factors based on AP-42, Section 1.4 (Natural Gas Combustion) corrected to lb/mmBtu using natural gas heat content (1,020 btu/cf).

c - Greenhouse Gas emission factors from 40 CFR 98, Subpart C, Table C-1.

d - CO2e calculated based on global warming potential (GWP) for each Greenhouse gas: CO2 = 1; CH4 = 25; and N2O = 298 (40 CFR Part 98, Subpart A).

e - Hourly emissions based on 29.8 MMBtu/hr, and annual emissions based on 8,760 hrs/yr.

CS Beef Packing Plant - Kuna, ID

Boiler 2

- Natural Gas Only

Toxic Air Pollutant Emissions

CAS	Compound	Emission Factor [a] lb/mmscf	lb/mmBtu	Emission Rate [d] lb/hr	lb/yr
7440-38-2	Arsenic	2.0E-04	2.0E-07	5.8E-06	0.05
7440-39-3	Barium	4.4E-03	4.3E-06	1.3E-04	1.1
71-43-2	Benzene	2.1E-03	2.1E-06	6.1E-05	0.5
7440-41-7	Beryllium	1.2E-05	1.2E-08	3.5E-07	0.003
7440-43-9	Cadmium	1.1E-03	1.1E-06	3.2E-05	0.3
7440-47-3_Cr	Chromium-Total [b]	1.4E-03	1.4E-06	4.1E-05	0.4
7440-47-3_CrIII	Chromium III	1.3E-03	1.3E-06	3.9E-05	0.3
7440-47-3_CrVI	Chromium VI	5.6E-05	5.5E-08	1.6E-06	0.014
7440-48-4	Cobalt	8.4E-05	8.2E-08	2.5E-06	0.02
7440-50-8	Copper	8.5E-04	8.3E-07	2.5E-05	0.2
50-00-0	Formaldehyde	7.5E-02	7.4E-05	2.2E-03	19
110-54-3	Hexane	1.8E+00	1.8E-03	5.3E-02	461
7439-96-5	Manganese	3.8E-04	3.7E-07	1.1E-05	0.10
7439-97-6	Mercury	2.6E-04	2.5E-07	7.6E-06	0.07
7439-98-7	Molybdenum	1.1E-03	1.1E-06	3.2E-05	0.3
91-20-3	Naphthalene	6.1E-04	6.0E-07	1.8E-05	0.2
7440-02-0	Nickel	2.1E-03	2.1E-06	6.1E-05	0.5
109-66-0	Pentane	2.6E+00	2.5E-03	7.6E-02	666
7782-49-2	Selenium	2.4E-05	2.4E-08	7.0E-07	0.006
108-88-3	Toluene	3.4E-03	3.3E-06	9.9E-05	0.9
10024-97-2	Nitrous Oxide	2.2E+00	2.2E-03	6.4E-02	563
56-55-3	Benz(a)anthracene	1.8E-06	1.8E-09	5.3E-08	0.0005
50-32-8	Benzo(a)pyrene	1.2E-06	1.2E-09	3.5E-08	0.0003
205-99-2	Benzo(b)fluoranthene	1.8E-06	1.8E-09	5.3E-08	0.0005
207-08-9	Benzo(k)fluoranthene	1.8E-06	1.8E-09	5.3E-08	0.0005
218-01-9	Chrysene	1.8E-06	1.8E-09	5.3E-08	0.0005
53-70-3	Dibenzo(a,h)anthrancene	1.2E-06	1.2E-09	3.5E-08	0.0003
193-39-5	Indeno(1,2,3-cd)pyrene	1.8E-06	1.8E-09	5.3E-08	0.0005
56-49-5	3-Methylchloranthrene	1.8E-06	1.8E-09	5.3E-08	0.0005
23521-22-6	Dichlorobenzene	1.2E-03	1.2E-06	3.5E-05	0.3
7440-66-6	Zinc	2.9E-02	2.8E-05	8.5E-04	7
PAH	PAH (total) [c]	-	-	3.33E-07	0.003

notes:

a - All other HAP and TAP emission factors based on AP-42, Section 1.4 (Natural Gas Combustion) corrected to lb/mmBtu using natural gas heat content (1,020 btu/cf).

b - AP-42 provides a chromium emission factor for natural gas fired external combustion, but does not include guidance for partitioning emissions between the carcinogenic chromium VI (hexavalent chromium) and the chromium III (trivalent chromium). EPA's 2002 National-Scale Air Toxics Assessment (NATA) released June 2009 includes a chromium speciation profile for natural gas-fired boilers, which indicates 4 percent of total chromium is chromium VI and 96 percent is chromium III. ENVIRON assumed 4 percent of total chromium emissions were emitted as chromium VI.

c - (Polycyclic Organic Matter) For emissions of PAH mixtures, the following PAHs and shall be considered together as one TAP, equivalent in potency to benzo(a)pyrene: benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, dibenzo(a,h)anthracene, chrysene, indenol(1,2,3,-cd)pyrene, benzo(a)pyrene.

d - Hourly emissions based on 29.8 MMBtu/hr and annual emissions based on 8,760 hrs/yr.

CS Beef Packing Plant - Kuna, ID

Boiler 3

- Biogas/Natural Gas Fired

	Boiler Specifications	
Operating hours	8,760 hours/year	
Firing rate	30.12 MMBtu/hr	HHV
Biogas Heat Input	10.09 MMBtu/hr	
NG Heat Input	20.04 MMBtu/hr	30123

Stack Exhaust Flow Information

Exhaust gas volume flow - dry standard	5,848 dscfm @ 3%O2	Corrected to 3% O2
Exhaust Temperature	508 F	
Exit Velocity	59.8 ft/s	
Exit Diameter	2.0 ft	
Exhaust gas volume - actual	11,269 acfm	based on expected operating conditions

Criteria and PSD Pollutant Emissions

Pollutant	Emission Factor lb/MMBtu	Emission Rate [f] lb/hr	tpy
NOx [a]	0.0402	1.21	5.30
CO [a]	0.0408	1.23	5.38
SO2 [b]	0.0006 / 0.274	2.777	12.16
PM10 (Filt. & Cond.) [a]	0.0125	0.377	1.65
PM2.5 (Filt.& Cond.) [a]	0.0125	0.377	1.65
VOC [c]	0.0054	0.162	0.71
Lead [c]	4.9E-07	1.5E-05	6.5E-05
CO2 [d]	207	6,236	27,313
CH4 [d]	2.2E-03	6.6E-02	2.9E-01
N2O [d]	2.2E-04	6.6E-03	2.9E-02
CO2e [e]		6,239	27,329

notes:

a - NOx and CO emissions based on 30 ppmv and 50 ppmv, respectively (vendor information). PM10/PM2.5 emissions based on vendor information for biogas/natural gas boiler.

b - SO2 emissions combination of NG combustion (0.0006 lb/MMBtu) and Biogas combustion (0.274 lb/MMBtu). Biogas passes through iron spunge to remove atleast 75 percent of H2S prior to combustion in the boiler.

c - Emission factors based on AP-42, Section 1.4 (Natural Gas Combustion) corrected to lb/mmBtu using natural gas heat content (1,020 btu/cf).

d - CO2 emission factor from boiler vendor based on carbon content in biogas. CH4 and H2O emission factors from 40 CFR 98, Subpart C, Table C-1.

3 - CO2e calculated based on global warming potential (GWP) for each Greenhouse gas: CO2 = 1; CH4 = 25; and N2O = 298 (40 CFR Part 98, Subpart A).

f - Hourly emissions based on 30.1 MMBtu/hr, and annual emissions based on 8,760 hrs/yr. Conservatively assume all biogas to this boiler.

CS Beef Packing Plant - Kuna, ID

Boiler 3

- Biogas/Natural Gas Fired

Toxic Air Pollutant Emissions

CAS	Compound	Emission Factor [a] lb/mmscf	lb/mmBtu	Emission Rate [d] lb/hr	lb/yr
7440-38-2	Arsenic	2.0E-04	2.0E-07	5.9E-06	0.05
7440-39-3	Barium	4.4E-03	4.3E-06	1.3E-04	1.1
71-43-2	Benzene	2.1E-03	2.1E-06	6.2E-05	0.5
7440-41-7	Beryllium	1.2E-05	1.2E-08	3.5E-07	0.003
7440-43-9	Cadmium	1.1E-03	1.1E-06	3.2E-05	0.3
7440-47-3_Cr	Chromium-Total [b]	1.4E-03	1.4E-06	4.1E-05	0.4
7440-47-3_CrIII	Chromium III	1.3E-03	1.3E-06	4.0E-05	0.3
7440-47-3_CrVI	Chromium VI	5.6E-05	5.5E-08	1.7E-06	0.014
7440-48-4	Cobalt	8.4E-05	8.2E-08	2.5E-06	0.02
7440-50-8	Copper	8.5E-04	8.3E-07	2.5E-05	0.2
50-00-0	Formaldehyde	7.5E-02	7.4E-05	2.2E-03	19
110-54-3	Hexane	1.8E+00	1.8E-03	5.3E-02	466
7439-96-5	Manganese	3.8E-04	3.7E-07	1.1E-05	0.10
7439-97-6	Mercury	2.6E-04	2.5E-07	7.7E-06	0.07
7439-98-7	Molybdenum	1.1E-03	1.1E-06	3.2E-05	0.3
91-20-3	Naphthalene	6.1E-04	6.0E-07	1.8E-05	0.2
7440-02-0	Nickel	2.1E-03	2.1E-06	6.2E-05	0.5
109-66-0	Pentane	2.6E+00	2.5E-03	7.7E-02	673
7782-49-2	Selenium	2.4E-05	2.4E-08	7.1E-07	0.006
108-88-3	Toluene	3.4E-03	3.3E-06	1.0E-04	0.9
10024-97-2	Nitrous Oxide	2.2E+00	2.2E-03	6.5E-02	569
56-55-3	Benz(a)anthracene	1.8E-06	1.8E-09	5.3E-08	0.0005
50-32-8	Benzo(a)pyrene	1.2E-06	1.2E-09	3.5E-08	0.0003
205-99-2	Benzo(b)fluoranthene	1.8E-06	1.8E-09	5.3E-08	0.0005
207-08-9	Benzo(k)fluoranthene	1.8E-06	1.8E-09	5.3E-08	0.0005
218-01-9	Chrysene	1.8E-06	1.8E-09	5.3E-08	0.0005
53-70-3	Dibenzo(a,h)anthrancene	1.2E-06	1.2E-09	3.5E-08	0.0003
193-39-5	Indeno(1,2,3-cd)pyrene	1.8E-06	1.8E-09	5.3E-08	0.0005
56-49-5	3-Methylchloranthrene	1.8E-06	1.8E-09	5.3E-08	0.0005
23521-22-6	Dichlorobenzene	1.2E-03	1.2E-06	3.5E-05	0.3
7440-66-6	Zinc	2.9E-02	2.8E-05	8.6E-04	8
PAH	PAH (total) [c]	-	-	3.37E-07	0.003

notes:

a - All other HAP and TAP emission factors based on AP-42, Section 1.4 (Natural Gas Combustion) corrected to lb/mmBtu using natural gas heat content (1,020 btu/cf).

b - AP-42 provides a chromium emission factor for natural gas fired external combustion, but does not include guidance for partitioning emissions between the carcinogenic chromium VI (hexavalent chromium) and the chromium III (trivalent chromium). EPA's 2002 National-Scale Air Toxics Assessment (NATA) released June 2009 includes a chromium speciation profile for natural gas-fired boilers, which indicates 4 percent of total chromium is chromium VI and 96 percent is chromium III. ENVIRON assumed 4 percent of total chromium emissions were emitted as chromium VI.

c - (Polycyclic Organic Matter) For emissions of PAH mixtures, the following PAHs and shall be considered together as one TAP, equivalent in potency to benzo(a)pyrene: benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, dibenzo(a,h)anthracene, chrysene, indenol(1,2,3,-cd)pyrene, benzo(a)pyrene.

d - Hourly emissions based on 30.1 MMBtu/hr and annual emissions based on 8,760 hrs/yr.

CS Beef Packing Plant - Kuna, ID

Boiler 4

- Biogas/Natural Gas Fired

	Boiler Specifications	
Operating hours	8,760 hours/year	
Max Total Firing rate	30.12 MMBtu/hr	HHV
Biogas Heat Input	10.09 MMBtu/hr	
NG Heat Input	20.04 MMBtu/hr	
Stack Exhaust Flow Information		
Exhaust gas volume flow - dry standard	5,848 dscfm @ 3%O2	Corrected to 3% O2
Exhaust Temperature	508 F	
Exit Velocity	59.8 ft/s	
Exit Diameter	2.0 ft	
Exhaust gas volume - actual	11,269 acfm	based on expected operating conditions

Criteria and PSD Pollutant Emissions

Pollutant	Emission Factor lb/MMBtu	Emission Rate [f] lb/hr	tpy
NOx [a]	0.0402	1.21	5.30
CO [a]	0.0408	1.23	5.38
SO2 [b]	0.0006 / 0.274	2.777	12.16
PM10 (Filt. & Cond.) [a]	0.0125	0.377	1.65
PM2.5 (Filt.& Cond.) [a]	0.0125	0.377	1.65
VOC [c]	0.0054	0.162	0.71
Lead [c]	4.9E-07	1.5E-05	6.5E-05
CO2 [d]	207	6,236	27,313
CH4 [d]	2.2E-03	6.6E-02	2.9E-01
N2O [d]	2.2E-04	6.6E-03	2.9E-02
CO2e [e]		6,239	27,329

notes:

a - NOx and CO emissions based on 30 ppmv and 50 ppmv, respectively (vendor information). PM10/PM2.5 emissions based on vendor information for biogas/natural gas boiler.

b - SO2 emissions combination of NG combustion (0.0006 lb/MMBtu) and Biogas combustion (0.274 lb/MMBtu). Biogas passes through iron spunge to remove atleast 75 percent of H2S prior to combustion in the boiler.

c - Emission factors based on AP-42, Section 1.4 (Natural Gas Combustion) corrected to lb/mmBtu using natural gas heat content (1,020 btu/cf).

d - CO2 emission factor from boiler vendor based on carbon content in biogas. CH4 and H2O emission factors from 40 CFR 98, Subpart C, Table C-1.

3 - CO2e calculated based on global warming potential (GWP) for each Greenhouse gas: CO2 = 1; CH4 = 25; and N2O = 298 (40 CFR Part 98, Subpart A).

f - Hourly emissions based on 30.1 MMBtu/hr, and annual emissions based on 8,760 hrs/yr. Conservatively assume all biogas to this boiler.

CS Beef Packing Plant - Kuna, ID

Boiler 4

- Biogas/Natural Gas Fired

Toxic Air Pollutant Emissions

CAS	Compound	Emission Factor [a] lb/mmscf	lb/mmBtu	Emission Rate [d] lb/hr	lb/yr
7440-38-2	Arsenic	2.0E-04	2.0E-07	5.9E-06	0.05
7440-39-3	Barium	4.4E-03	4.3E-06	1.3E-04	1.1
71-43-2	Benzene	2.1E-03	2.1E-06	6.2E-05	0.5
7440-41-7	Beryllium	1.2E-05	1.2E-08	3.5E-07	0.003
7440-43-9	Cadmium	1.1E-03	1.1E-06	3.2E-05	0.3
7440-47-3_Cr	Chromium-Total [b]	1.4E-03	1.4E-06	4.1E-05	0.4
7440-47-3_CrIII	Chromium III	1.3E-03	1.3E-06	4.0E-05	0.3
7440-47-3_CrVI	Chromium VI	5.6E-05	5.5E-08	1.7E-06	0.014
7440-48-4	Cobalt	8.4E-05	8.2E-08	2.5E-06	0.02
7440-50-8	Copper	8.5E-04	8.3E-07	2.5E-05	0.2
50-00-0	Formaldehyde	7.5E-02	7.4E-05	2.2E-03	19
110-54-3	Hexane	1.8E+00	1.8E-03	5.3E-02	466
7439-96-5	Manganese	3.8E-04	3.7E-07	1.1E-05	0.10
7439-97-6	Mercury	2.6E-04	2.5E-07	7.7E-06	0.07
7439-98-7	Molybdenum	1.1E-03	1.1E-06	3.2E-05	0.3
91-20-3	Naphthalene	6.1E-04	6.0E-07	1.8E-05	0.2
7440-02-0	Nickel	2.1E-03	2.1E-06	6.2E-05	0.5
109-66-0	Pentane	2.6E+00	2.5E-03	7.7E-02	673
7782-49-2	Selenium	2.4E-05	2.4E-08	7.1E-07	0.006
108-88-3	Toluene	3.4E-03	3.3E-06	1.0E-04	0.9
10024-97-2	Nitrous Oxide	2.2E+00	2.2E-03	6.5E-02	569
56-55-3	Benz(a)anthracene	1.8E-06	1.8E-09	5.3E-08	0.0005
50-32-8	Benzo(a)pyrene	1.2E-06	1.2E-09	3.5E-08	0.0003
205-99-2	Benzo(b)fluoranthene	1.8E-06	1.8E-09	5.3E-08	0.0005
207-08-9	Benzo(k)fluoranthene	1.8E-06	1.8E-09	5.3E-08	0.0005
218-01-9	Chrysene	1.8E-06	1.8E-09	5.3E-08	0.0005
53-70-3	Dibenzo(a,h)anthrancene	1.2E-06	1.2E-09	3.5E-08	0.0003
193-39-5	Indeno(1,2,3-cd)pyrene	1.8E-06	1.8E-09	5.3E-08	0.0005
56-49-5	3-Methylchloranthrene	1.8E-06	1.8E-09	5.3E-08	0.0005
23521-22-6	Dichlorobenzene	1.2E-03	1.2E-06	3.5E-05	0.3
7440-66-6	Zinc	2.9E-02	2.8E-05	8.6E-04	8
PAH	PAH (total) [c]	-	-	3.37E-07	0.003

notes:

a - All other HAP and TAP emission factors based on AP-42, Section 1.4 (Natural Gas Combustion) corrected to lb/mmBtu using natural gas heat content (1,020 btu/cf).

b - AP-42 provides a chromium emission factor for natural gas fired external combustion, but does not include guidance for partitioning emissions between the carcinogenic chromium VI (hexavalent chromium) and the chromium III (trivalent chromium). EPA's 2002 National-Scale Air Toxics Assessment (NATA) released June 2009 includes a chromium speciation profile for natural gas-fired boilers, which indicates 4 percent of total chromium is chromium VI and 96 percent is chromium III. ENVIRON assumed 4 percent of total chromium emissions were emitted as chromium VI.

c - (Polycyclic Organic Matter) For emissions of PAH mixtures, the following PAHs and shall be considered together as one TAP, equivalent in potency to benzo(a)pyrene: benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, dibenzo(a,h)anthracene, chrysene, indenol(1,2,3,-cd)pyrene, benzo(a)pyrene.

d - Hourly emissions based on 30.1 MMBtu/hr and annual emissions based on 8,760 hrs/yr.

CS Beef Packing Plant - Kuna, ID

Air Make up Units for Site

- Natural Gas Only

	Boiler Specifications	
Operating hours	8,760 hours/year	
Total Firing rate	92.50 MMBtu/hr	
Total Air Flow	924,000 cfm	
Stack Exhaust Flow Information		
F Factor (Natural Gas)	8,710 dscf/MMBtu	Source: EPA Method 19
Exhaust gas volume flow	13,428 dscfm @ 0%O2	
Exhaust gas volume flow - corrected	15,678 dscfm @ 3%O2	Corrected to 3% O2

Criteria and PSD Pollutant Emissions

Pollutant	Emission Factor lb/MMBtu	Emission Rate [e] lb/hr	tpy
NOx [a]	0.0486	4.49	19.68
CO [a]	0.0370	3.42	14.98
SO2 [b]	0.0006	0.054	0.24
PM10 (Filt. & Cond.) [b]	0.0075	0.689	3.02
PM2.5 (Filt.& Cond.) [b]	0.0075	0.689	3.02
VOC [b]	0.0054	0.499	2.18
Lead [b]	4.9E-07	4.5E-05	2.0E-04
CO2 [c]	117	10,812	47,358
CH4 [c]	2.2E-03	2.0E-01	8.9E-01
N2O [c]	2.2E-04	2.0E-02	8.9E-02
CO2e [d]		10,823	47,407

notes:

a - NOx and CO emissions based on 40 ppmv and 50 ppmv, respectively (Maxon NP-LE burners at 500 Mbtu/hr/ft).

b - Emission factors based on AP-42, Section 1.4 (Natural Gas Combustion) corrected to lb/mmBtu using natural gas heat content (1,020 btu/cf).

c - Greenhouse Gas emission factors from 40 CFR 98, Subpart C, Table C-1.

d - CO2e calculated based on global warming potential (GWP) for each Greenhouse gas: CO2 = 1; CH4 = 25; and N2O = 298 (40 CFR Part 98, Subpart A).

e - Hourly emissions based on 92.5 MMBtu/hr, and annual emissions based on 8,760 hrs/yr.

CS Beef Packing Plant - Kuna, ID

Air Make up Units for Site

- Natural Gas Only

Toxic Air Pollutant Emissions

CAS	Compound	Emission Factor [a] lb/mmscf	Emission Factor [a] lb/mmBtu	Emission Rate [d] lb/hr	Emission Rate [d] lb/yr
7440-38-2	Arsenic	2.0E-04	2.0E-07	1.8E-05	0.2
7440-39-3	Barium	4.4E-03	4.3E-06	4.0E-04	3
71-43-2	Benzene	2.1E-03	2.1E-06	1.9E-04	2
7440-41-7	Beryllium	1.2E-05	1.2E-08	1.1E-06	0.010
7440-43-9	Cadmium	1.1E-03	1.1E-06	1.0E-04	0.9
7440-47-3_Cr	Chromium-Total [b]	1.4E-03	1.4E-06	1.3E-04	1.1
7440-47-3_CrIII	Chromium III	1.3E-03	1.3E-06	1.2E-04	1.1
7440-47-3_CrVI	Chromium VI	5.6E-05	5.5E-08	5.1E-06	0.04
7440-48-4	Cobalt	8.4E-05	8.2E-08	7.6E-06	0.07
7440-50-8	Copper	8.5E-04	8.3E-07	7.7E-05	1
50-00-0	Formaldehyde	7.5E-02	7.4E-05	6.8E-03	60
110-54-3	Hexane	1.8E+00	1.8E-03	1.6E-01	1,430
7439-96-5	Manganese	3.8E-04	3.7E-07	3.4E-05	0.30
7439-97-6	Mercury	2.6E-04	2.5E-07	2.4E-05	0.21
7439-98-7	Molybdenum	1.1E-03	1.1E-06	1.0E-04	0.9
91-20-3	Naphthalene	6.1E-04	6.0E-07	5.5E-05	0.5
7440-02-0	Nickel	2.1E-03	2.1E-06	1.9E-04	1.7
109-66-0	Pentane	2.6E+00	2.5E-03	2.4E-01	2,065
7782-49-2	Selenium	2.4E-05	2.4E-08	2.2E-06	0.02
108-88-3	Toluene	3.4E-03	3.3E-06	3.1E-04	2.7
10024-97-2	Nitrous Oxide	2.2E+00	2.2E-03	2.0E-01	1,748
56-55-3	Benz(a)anthracene	1.8E-06	1.8E-09	1.6E-07	0.001
50-32-8	Benzo(a)pyrene	1.2E-06	1.2E-09	1.1E-07	0.001
205-99-2	Benzo(b)fluoranthene	1.8E-06	1.8E-09	1.6E-07	0.001
207-08-9	Benzo(k)fluoranthene	1.8E-06	1.8E-09	1.6E-07	0.001
218-01-9	Chrysene	1.8E-06	1.8E-09	1.6E-07	0.001
53-70-3	Dibenzo(a,h)anthrancene	1.2E-06	1.2E-09	1.1E-07	0.001
193-39-5	Indeno(1,2,3-cd)pyrene	1.8E-06	1.8E-09	1.6E-07	0.001
56-49-5	3-Methylchloranthrene	1.8E-06	1.8E-09	1.6E-07	0.001
23521-22-6	Dichlorobenzene	1.2E-03	1.2E-06	1.1E-04	1.0
7440-66-6	Zinc	2.9E-02	2.8E-05	2.6E-03	23
PAH	PAH (total) [c]	-	-	1.03E-06	0.009

notes:

a - All other HAP and TAP emission factors based on AP-42, Section 1.4 (Natural Gas Combustion) corrected to lb/mmBtu using natural gas heat content (1,020 btu/cf).

b - AP-42 provides a chromium emission factor for natural gas fired external combustion, but does not include guidance for partitioning emissions between the carcinogenic chromium VI (hexavalent chromium) and the chromium III (trivalent chromium). EPA's 2002 National-Scale Air Toxics Assessment (NATA) released June 2009 includes a chromium speciation profile for natural gas-fired boilers, which indicates 4 percent of total chromium is chromium VI and 96 percent is chromium III. ENVIRON assumed 4 percent of total chromium emissions were emitted as chromium VI.

c - (Polycyclic Organic Matter) For emissions of PAH mixtures, the following PAHs and shall be considered together as one TAP, equivalent in potency to benzo(a)pyrene: benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, dibenzo(a,h)anthracene, chrysene, indenol(1,2,3,-cd)pyrene, benzo(a)pyrene.

d - Hourly emissions based on 92.5 MMBtu/hr and annual emissions based on 8,760 hrs/yr.

CS Beef Packing Plant - Kuna, ID

Natural Gas Combustion in Truck Maintenance Shop

- Natural Gas Only

	Specifications
Operating hours	8,760 hours/year
Total Firing rate	0.92 MMBtu/hr
Hot Water Heater	0.66 MMBtu/hr
Space Heating	0.26 MMBtu/hr

Criteria and PSD Pollutant Emissions

Pollutant	Emission Factor [a] lb/MMBtu	Emission Rate [d] lb/hr	tpy
NOx	0.0980	0.09	0.39
CO	0.0824	0.08	0.33
SO2	0.0006	0.001	0.002
PM10 (Filt. & Cond.)	0.0075	0.007	0.03
PM2.5 (Filt.& Cond.)	0.0075	0.007	0.03
VOC	0.0054	0.005	0.02
Lead	4.9E-07	4.5E-07	2.0E-06
CO2 [b]	117	107	469
CH4 [b]	2.2E-03	2.0E-03	8.8E-03
N2O [b]	2.2E-04	2.0E-04	8.8E-04
CO2e [c]		107	470

notes:

a - Emission factors based on AP-42, Section 1.4 (Natural Gas Combustion) corrected to lb/mmBtu using natural gas heat content (1,020 btu/cf).

b - Greenhouse Gas emission factors from 40 CFR 98, Subpart C, Table C-1.

c - CO2e calculated based on global warming potential (GWP) for each Greenhouse gas: CO2 = 1; CH4 = 25; and N2O = 298 (40 CFR Part 98, Subpart A).

d - Hourly emissions based on 0.9 MMBtu/hr, and annual emissions based on 8,760 hrs/yr.

CS Beef Packing Plant - Kuna, ID

Natural Gas Combustion in Truck Maintenance Shop

- Natural Gas Only

Toxic Air Pollutant Emissions

CAS	Compound	Emission Factor [a] lb/mmscf	Emission Factor [a] lb/mmBtu	Emission Rate [d] lb/hr	Emission Rate [d] lb/yr
7440-38-2	Arsenic	2.0E-04	2.0E-07	1.8E-07	0.0
7440-39-3	Barium	4.4E-03	4.3E-06	4.0E-06	0
71-43-2	Benzene	2.1E-03	2.1E-06	1.9E-06	0
7440-41-7	Beryllium	1.2E-05	1.2E-08	1.1E-08	0.000
7440-43-9	Cadmium	1.1E-03	1.1E-06	9.9E-07	0.0
7440-47-3_Cr	Chromium-Total [b]	1.4E-03	1.4E-06	1.3E-06	0.0
7440-47-3_CrIII	Chromium III	1.3E-03	1.3E-06	1.2E-06	0.0
7440-47-3_CrVI	Chromium VI	5.6E-05	5.5E-08	5.0E-08	0.00
7440-48-4	Cobalt	8.4E-05	8.2E-08	7.6E-08	0.00
7440-50-8	Copper	8.5E-04	8.3E-07	7.6E-07	0
50-00-0	Formaldehyde	7.5E-02	7.4E-05	6.7E-05	1
110-54-3	Hexane	1.8E+00	1.8E-03	1.6E-03	14
7439-96-5	Manganese	3.8E-04	3.7E-07	3.4E-07	0.00
7439-97-6	Mercury	2.6E-04	2.5E-07	2.3E-07	0.00
7439-98-7	Molybdenum	1.1E-03	1.1E-06	9.9E-07	0.0
91-20-3	Naphthalene	6.1E-04	6.0E-07	5.5E-07	0.0
7440-02-0	Nickel	2.1E-03	2.1E-06	1.9E-06	0.0
109-66-0	Pentane	2.6E+00	2.5E-03	2.3E-03	20
7782-49-2	Selenium	2.4E-05	2.4E-08	2.2E-08	0.00
108-88-3	Toluene	3.4E-03	3.3E-06	3.1E-06	0.0
10024-97-2	Nitrous Oxide	2.2E+00	2.2E-03	2.0E-03	17
56-55-3	Benz(a)anthracene	1.8E-06	1.8E-09	1.6E-09	0.000
50-32-8	Benzo(a)pyrene	1.2E-06	1.2E-09	1.1E-09	0.000
205-99-2	Benzo(b)fluoranthene	1.8E-06	1.8E-09	1.6E-09	0.000
207-08-9	Benzo(k)fluoranthene	1.8E-06	1.8E-09	1.6E-09	0.000
218-01-9	Chrysene	1.8E-06	1.8E-09	1.6E-09	0.000
53-70-3	Dibenzo(a,h)anthrancene	1.2E-06	1.2E-09	1.1E-09	0.000
193-39-5	Indeno(1,2,3-cd)pyrene	1.8E-06	1.8E-09	1.6E-09	0.000
56-49-5	3-Methylchloranthrene	1.8E-06	1.8E-09	1.6E-09	0.000
23521-22-6	Dichlorobenzene	1.2E-03	1.2E-06	1.1E-06	0.0
7440-66-6	Zinc	2.9E-02	2.8E-05	2.6E-05	0
PAH	PAH (total) [c]	-	-	1.02E-08	0.000

notes:

a - All other HAP and TAP emission factors based on AP-42, Section 1.4 (Natural Gas Combustion) corrected to lb/mmBtu using natural gas heat content (1,020 btu/cf).

b - AP-42 provides a chromium emission factor for natural gas fired external combustion, but does not include guidance for partitioning emissions between the carcinogenic chromium VI (hexavalent chromium) and the chromium III (trivalent chromium). EPA's 2002 National-Scale Air Toxics Assessment (NATA) released June 2009 includes a chromium speciation profile for natural gas-fired boilers, which indicates 4 percent of total chromium is chromium VI and 96 percent is chromium III. ENVIRON assumed 4 percent of total chromium emissions were emitted as chromium VI.

c - (Polycyclic Organic Matter) For emissions of PAH mixtures, the following PAHs and shall be considered together as one TAP, equivalent in potency to benzo(a)pyrene: benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, dibenzo(a,h)anthracene, chrysene, indenol(1,2,3,-cd)pyrene, benzo(a)pyrene.

d - Hourly emissions based on 0.9 MMBtu/hr and annual emissions based on 8,760 hrs/yr.

BIOGAS FLARE

Pollutant	Emission Factor (lb/MMscf)	Emission Factor (lb/MMBtu)[c]	Potential to Emit lb/hr	Potential to Emit TPY
NOx	-	0.068	0.7	3.0
CO	-	0.37	3.7	16.3
SO2[a]	589.9	-	11.1	48.4
PM-10 [b]	-	7.5E-03	0.08	0.3
PM-2.5 [b]	-	7.5E-03	0.08	0.3
VOC	-	0.14	1.4	6.2
Lead [b]	-	4.9E-07	4.9E-06	2.2E-05

Biogas Flow Rate - Daily	450,000	cf/day
Operations	8,760	hrs/yr
Biogas Heat Content	538	btu/scf
Flare Heat Capacity - ST	10.1	MMBtu/hr
Flare Heat Capacity - LT	88,367	MMBtu/yr

Notes:

(a) The SO2 emission factor based on estimated H2S in the biogas (3,500 ppmv H2S).

(b) Emission factors based on AP-42, Section 1.4 (Natural Gas Combustion) corrected to lb/mmBtu using natural gas heat content (1,020 btu/cf). Conservatively assume PM2.5 emission rates are equivalent to PM10 emission rates.

(c) Emission factors from AP-42 Section 13.5, Industrial Flares, September 1991. This Section contained emission factors for only NOx, CO and VOCs.

Greenhouse Gas Emissions

Greenhouse Gas	Emission Factor [a] lb/MMscf	Emission Factor [a] lb/MMBtu	Emission Rate [b] lb/hr	Emission Rate [b] tpy
CO2	--	207	2,088	9,146
CH4	--	2.2E-03	2.2E-02	9.7E-02
N2O	--	2.2E-04	2.2E-03	9.7E-03
CO2e [c]			2,089	9,151

notes:

a - CO2 emisison factor based on biogas composition, CH4 and N2O emission factors from 40 CFR 98, Subpart C, Table C-1.

b - Hourly emissions based on 10.1 MMBtu/hr and annual emissions based on 88,367 MMBtu/yr and 8760 MMscf/yr.

c - CO2e calculated based on global warming potential (GWP) for each Greenhouse gas: CO2 = 1; CH4 = 25; and N2O = 298 (40 CFR Part 98, Subpart A).

Flare Stack Parameter Calculations [a]		
Total Heat release	cal/s	706,586
Radiative Heat Loss	%	65.0
Net Heat Release	cal/s	247,305
Effective Stack Diameter	m	0.49
Physical Stack Height	m	6.1
Effective Stack Height	m	8.9

notes:

a - Flare release parameters calculated using EPA Guidance Document: EPA-450/4-88-010 (Screening Procedures for Estimating the Air Quality Impact of Stationary Sources).

CS Beef Packing Plant - Kuna, ID

Rendering Plant

- Blood Dryer and Continuous Rendering Equipment

	Specifications	
Operating hours	8,760 hours/year	
Blood Dryer NG Firing rate	4.50 MMBtu/hr	HHV
Rendering Throughput	4.25 dry tons/hr	meat bone meal
Blood Dryer Throughput	0.59 dry tons/hr	blood meal
# of 12,000 CFM Venturi Scrubbers	2	
# of 12,000 CFM Packed Bed Scrubbers	2	
# of 20,000 CFM Venturi Scrubbers	1	
# of 75,000 CFM Packed Bed Scrubbers	2	
Venturi Scrubber minimum PM Control Eff.	85%	
Packed Bed Odor minimum Control Eff.	85%	

Pollutant Emissions - #2 75,000 cfm Packed Bed Scrubber

Pollutant	Emission Factor lb/dry ton MBM	Emission Rate [b] lb/hr	tpy
PM10 (Filt. & Cond.) [a]	0.070	0.30	1.3
PM2.5 (Filt.& Cond.) [a]	0.070	0.30	1.3
VOC [a]	0.15	0.63	2.8

notes:

a - PM10/PM2.5 and VOC emission factors from IBP Dakota City were provided to EPA during the AP-42 Section 9.5.3 (Meat Rendering Plant) comment period and represent continuous cooker operations controlled by packed bed scrubber. NOx, CO, and SO2 measured during Dakota City test were in ppb concentrations. No combustion emissions are associated with steam heated cooker. Test report is available on EPA's AP-42 website.

b - Hourly emissions based on 4.3 tph dry MBM, and annual emissions based on 8,760

Pollutant Emissions - #1 75,000 cfm Packed Bed Scrubber

Pollutant	Emission Factor lb/MMBtu	Emission Factor lb/dry ton blood meal	Emission Rate [f] lb/hr	tpy
NOx [a]	0.035	--	0.16	0.7
CO [a]	0.30	--	1.4	5.9
SO2 [b]	0.0006	--	0.003	0.0
PM10 (Filt. & Cond.) [c]	--	1.22	0.71	3.1
PM2.5 (Filt.& Cond.) [c]	--	1.22	0.71	3.1
VOC [c]	--	0.24	0.14	0.6
Lead [b]	4.9E-07	--	2.2E-06	9.7E-06
CO2 [d]	117	--	526	2,304
CH4 [d]	2.2E-03	--	9.9E-03	4.3E-02
N2O [d]	2.2E-04	--	9.9E-04	4.3E-03
CO2e [e]			527	2,306

notes:

a - NOx and CO emissions based on 30 ppmv and 400 ppmv, respectively (vendor

b - Emission factors based on AP-42, Section 1.4 (Natural Gas Combustion) corrected to lb/mmBtu using natural gas heat content (1,020 btu/cf).

Plant). Uncontrolled VOC emissions from IBP Dakota City were provided to EPA during the AP-42 comment period and represent natural gas-fired blood dryer and beef processing. Test report available on EPA's AP-42 website.

d - Greenhouse Gas emission factors from 40 CFR 98, Subpart C, Table C-1.

e - CO2e calculated based on global warming potential (GWP) for each Greenhouse gas:

f - Hourly emissions based on 4.5 MMBtu/hr, 0.59 tph dried blood meal, and annual

CS Beef Packing Plant - Kuna, ID

Rendering Plant

- Blood Dryer and Continuous Rendering Equipment

Toxic Air Pollutant Emissions - #1 75,000 cfm Packed Bed Scrubber

CAS	Compound	Emission Factor [a] lb/mmscf	lb/mmBtu	Emission Rate [e] lb/hr	lb/yr
7440-38-2	Arsenic	2.0E-04	2.0E-07	8.8E-07	0.008
7440-39-3	Barium	4.4E-03	4.3E-06	1.9E-05	0.2
71-43-2	Benzene	2.1E-03	2.1E-06	9.3E-06	0.08
7440-41-7	Beryllium	1.2E-05	1.2E-08	5.3E-08	0.0005
7440-43-9	Cadmium	1.1E-03	1.1E-06	4.9E-06	0.04
7440-47-3_Cr	Chromium-Total [b]	1.4E-03	1.4E-06	6.2E-06	0.05
7440-47-3_CrIII	Chromium III	1.3E-03	1.3E-06	5.9E-06	0.05
7440-47-3_CrVI	Chromium VI	5.6E-05	5.5E-08	2.5E-07	0.002
7440-48-4	Cobalt	8.4E-05	8.2E-08	3.7E-07	0.003
7440-50-8	Copper	8.5E-04	8.3E-07	3.8E-06	0.03
50-00-0	Formaldehyde	7.5E-02	7.4E-05	3.3E-04	3
110-54-3	Hexane	1.8E+00	1.8E-03	7.9E-03	70
7783-06-4	Hydrogen Sulfide [c]	0.08 lb/dry ton		0.047	410
7439-96-5	Manganese	3.8E-04	3.7E-07	1.7E-06	0.015
7439-97-6	Mercury	2.6E-04	2.5E-07	1.1E-06	0.010
7439-98-7	Molybdenum	1.1E-03	1.1E-06	4.9E-06	0.04
91-20-3	Naphthalene	6.1E-04	6.0E-07	2.7E-06	0.02
7440-02-0	Nickel	2.1E-03	2.1E-06	9.3E-06	0.08
109-66-0	Pentane	2.6E+00	2.5E-03	1.1E-02	100
7782-49-2	Selenium	2.4E-05	2.4E-08	1.1E-07	0.0009
108-88-3	Toluene	3.4E-03	3.3E-06	1.5E-05	0.13
10024-97-2	Nitrous Oxide	2.2E+00	2.2E-03	9.7E-03	85
56-55-3	Benz(a)anthracene	1.8E-06	1.8E-09	7.9E-09	0.00007
50-32-8	Benzo(a)pyrene	1.2E-06	1.2E-09	5.3E-09	0.00005
205-99-2	Benzo(b)fluoranthene	1.8E-06	1.8E-09	7.9E-09	0.00007
207-08-9	Benzo(k)fluoranthene	1.8E-06	1.8E-09	7.9E-09	0.00007
218-01-9	Chrysene	1.8E-06	1.8E-09	7.9E-09	0.00007
53-70-3	Dibenzo(a,h)anthrancene	1.2E-06	1.2E-09	5.3E-09	0.00005
193-39-5	Indeno(1,2,3-cd)pyrene	1.8E-06	1.8E-09	7.9E-09	0.00007
56-49-5	3-Methylchloranthrene	1.8E-06	1.8E-09	7.9E-09	0.00007
23521-22-6	Dichlorobenzene	1.2E-03	1.2E-06	5.3E-06	0.05
7440-66-6	Zinc	2.9E-02	2.8E-05	1.3E-04	1.1
7664-41-7	Ammonia [c]	0.6 lb/dry ton		0.35	3,075
PAH	PAH (total) [d]	-	-	5.03E-08	0.0004

notes:

a - All other HAP and TAP emission factors based on AP-42, Section 1.4 (Natural Gas Combustion) corrected to lb/mmBtu using natural gas heat content (1,020 btu/cf).

b - AP-42 provides a chromium emission factor for natural gas fired external combustion, but does not include guidance for

c - Ammonia and H2S emission factor from EPA's AP-42 Section 9.5.3 (Rendering) for natural gas fired blood dryer.

d - (Polycyclic Organic Matter) For emissions of PAH mixtures, the following PAHs and shall be considered together as one

e - Hourly emissions based on 4.5 MMBtu/hr, 0.59 tph dried blood meal, and annual emissions based on 8,760 hrs/yr.

CS Beef Packing Plant - Kuna, ID

Two natural gas-fired emergency generators at the site (EGEN1 & EGEN2)

- 100kW Olympian G100LG4, Emergency Generator
- Emission calculations below are per emergency generator.

	Generator Specifications
Operating hours	100 hours/year
Engine Size	149 BHP
Firing rate	1.14 MMBtu/hr

Criteria and PSD Pollutant Emissions - per Emergency Generator

Pollutant	Emission Factor		Potential to Emit [e]	
	g/kw-hr [a]	lb/MMBtu [b]	lb/hr	TPY
NOx	2.7	--	0.66	0.033
CO	5.4	--	1.32	0.066
SO2	--	0.000588	6.7E-04	3.3E-05
PM-10	--	0.010	0.011	5.7E-04
PM-2.5	--	0.010	0.011	5.7E-04
VOC	1.3	--	0.32	0.016
CO2 [c]	--	117	133	7
CH4 [c]	--	2.2E-03	2.5E-03	1.3E-04
N2O [c]	--	2.2E-04	2.5E-04	1.3E-05
CO2e [d]			133	7

a - NOx, CO and VOC emissions are based on NSPS Supbart JJJJ emission standards for the engine size and model year.

b - Emission factors from AP-42 Section 3.2 for 4-Stroke Lean Burn Engines. Conservatively assume PM2.5 emission rates are equivalent to PM10 emission rates.

c - Greenhouse Gas emission factors from 40 CFR 98, Subpart C, Table C-1.

d - CO2e calculated based on global warming potential (GWP) for each Greenhouse gas: CO2 = 1; CH4 = 25; and N2O = 298 (40 CFR Part 98, Subpart A).

e - Hourly and 24-hour emissions based on 1.1 MMBtu/hr max input and annual emissions based on 100 hrs/yr.

CS Beef Packing Plant - Kuna, ID

Two natural gas-fired emergency generators at the site (EGEN1 & EGEN2)

Toxic Air Pollutant Emissions - per Emergency Generator

CAS#	Pollutant	Emission Factor (lb/MMBtu)[a]	PTE lb/hr [d]	PTE lb/yr [d]
25551-13-7a	1,2,3-Trimethylbenzene	2.30E-05	2.6E-05	2.6E-03
25551-13-7b	1,2,4-Trimethylbenzene	1.43E-05	1.6E-05	1.6E-03
25551-13-7	1,3,5-Trimethylbenzene	3.38E-05	3.8E-05	3.8E-03
106-99-0	1,3-Butadiene	2.67E-04	3.0E-04	3.0E-02
540-84-1	2,2,4-Trimethylpentane	2.50E-04	2.8E-04	2.8E-02
83-32-9	Acenaphthene [b]	7.03E-07	8.0E-07	8.0E-05
208-96-8	Acenaphthylene [b]	7.44E-06	8.5E-06	8.5E-04
75-07-0	Acetaldehyde [b]	3.91E-03	4.5E-03	4.5E-01
107-02-8	Acrolein [b]	1.60E-03	1.8E-03	1.8E-01
120-12-7	Anthracene [b]	2.51E-07	2.9E-07	2.9E-05
71-43-2	Benzene [b]	1.19E-03	1.4E-03	1.4E-01
192-97-2	Benzo(e)pyrene	4.15E-07	4.7E-07	4.7E-05
191-24-2	Benzo(g,h,i)perylene [b]	1.01E-07	1.1E-07	1.1E-05
92-52-4	Biphenyl	2.12E-04	2.4E-04	2.4E-02
287-92-3	Cyclopentane	2.27E-04	2.6E-04	2.6E-02
100-41-4	Ethylbenzene	3.97E-05	4.5E-05	4.5E-03
206-44-0	Fluoranthene [b]	2.45E-07	2.8E-07	2.8E-05
86-73-7	Fluorene [b]	4.51E-07	5.1E-07	5.1E-05
50-00-0	Formaldehyde [b]	2.81E-02	3.2E-02	3.2E+00
67-56-1	Methanol	2.50E-03	2.8E-03	2.8E-01
108-87-2	Methylcyclohexane	1.23E-03	1.4E-03	1.4E-01
75-09-2	Methylene Chloride	2.00E-05	2.3E-05	2.3E-03
110-54-3	n-Hexane	1.11E-03	1.3E-03	1.3E-01
111-84-2	n-Nonane	1.10E-04	1.3E-04	1.3E-02
111-65-9	n-Octane	3.51E-04	4.0E-04	4.0E-02
109-66-0	n-Pentane	2.60E-03	3.0E-03	3.0E-01
91-20-3	Naphthalene [b]	1.20E-04	1.4E-04	1.4E-02
108-95-2	Phenol	2.40E-05	2.7E-05	2.7E-03
85-01-8	Phenanthrene [b]	8.75E-07	1.0E-06	1.0E-04
129-00-0	Pyrene [b]	1.21E-07	1.4E-07	1.4E-05
79-34-5	Tetrachloroethane	2.48E-06	2.8E-06	2.8E-04
108-88-3	Toluene [b]	4.04E-04	4.6E-04	4.6E-02
75-01-4	Vinyl Chloride	1.49E-05	1.7E-05	1.7E-03
1330-20-7	Xylene [b]	1.33E-04	1.5E-04	1.5E-02
	Idaho PAH Group			
56-55-3	Benzo(a)anthracene [b]	7.63E-08	8.7E-08	8.7E-06
50-32-8	Benzo(a)pyrene [b]	3.48E-08	4.0E-08	4.0E-06
205-99-2	Benzo(b)fluoranthene [b]	3.21E-07	3.6E-07	3.6E-05
207-08-9	Benzo(k)fluoranthene [b]	5.20E-07	5.9E-07	5.9E-05
218-01-9	Chrysene [b]	9.45E-08	1.1E-07	1.1E-05
53-70-3	Dibenz(a,h)anthracene [b]	1.07E-08	1.2E-08	1.2E-06
193-39-5	Indeno(1,2,3-cd)pyrene [b]	1.18E-07	1.3E-07	1.3E-05
PAH	PAH [c]	--	1.3E-06	1.3E-04

Notes:

a - Emission factors from AP-42 Section 3.2 for 4-Stroke Lean Burn Engines.

b - Emission factors from CATEF Database for 4-Stroke Lean Burn Engines (<650 HP), accessed on January 11, 2011.

c - PAH group contains the following PAHs: benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, dibenzo(a,h)anthracene, chrysene, indenol(1,2,3,-cd)pyrene, benzo(a)pyrene.

d - Hourly and 24-hour emissions based on 1.1 MMBtu/hr max input and annual emissions based on 100 hrs/yr.

CS Beef Packing Plant - Kuna, ID

Bin Vent Filter

- Located on salt silo

	Specifications
Operating hours	8,760 hours/year
Fan exhaust rating	400 cfm

Criteria and PSD Pollutant Emissions

Pollutant	Emission Factor [a] gr/dscf	Emission Rate [b] lb/hr	tpy
PM10 (Filt. & Cond.)	0.005	0.02	0.08
PM2.5 (Filt.& Cond.)	0.005	0.02	0.08

notes:

a - Particulate matter grain loading based on vendor information for baghouse filters.

b - Hourly emissions based on 400 cfm, and annual emissions based on 8,760 hrs/yr.

CS Beef Packing Plant - Kuna, ID

Fugitive Dust from Paved Roadways

PAVED AREAS

From AP-42 13.2.1

number of days with more than 0.01 in of rain = 89

- http://www.wrcc.dri.edu/climatedata/tables/

The following equation may be used to estimate the dust emissions from a ***paved*** road.

$$E = k\,(sL)^{0.91}\,(W)^{1.02}\left(1 - \frac{P}{4 * 365}\right)$$

E = particulate emission factor
k = base emission factor for particulate size range
sL = road surface silt loading (grams per square meter)
W = average weight (tons) of the vehicles traveling the road
P = number of days in year with at least 0.01 in of precipitation

Tabulated data for k values

Size Range	Multiplier (k)		
	g/VKT	g/VMT	lb/VMT
PM-2.5	0.15	0.25	0.00054
PM-10	0.62	1	0.0022
PM-15	0.77	1.23	0.0027
PM-30	3.23	5.24	0.011

UNITS

g/VKT	grams per vehicle kilometer traveled
g/VMT	grams per vehicle mile traveled
lb/VMT	pounds per vehicle mile traveled

Values being used to calculate emission factor E:

	PM2.5	PM10	PM30	
sL =	9.700	9.700	9.700	(g/m^2)
k =	0.00054	0.0022	0.011	(lb/Vehicle Mile Traveled)

	# Trips		E (lbs/mile)			Miles per Trip	# of Days of Operation	Total Vehicles Miles for Vehicles of this type	Emissions (tons/yr)		
Equipment	Per Day	W (tons)	$PM_{2.5}$	PM_{10}	TSP	Per Day	Per Year	Per Year	$PM_{2.5}$	PM_{10}	TSP
18 Wheel Cattle Trucks	40	29	0.12	0.50	2.51	1.0	365	365	0.02	0.09	0.5
Goose-Neck Cattle Trucks	10	20	0.09	0.35	1.73	1.0	365	365	0.02	0.06	0.3
18 Wheel Refrigerated Trucks	21	29	0.12	0.50	2.51	1.0	365	365	0.02	0.09	0.5
Rendering Finished Product Trucks	6	29	0.12	0.50	2.51	1.0	365	365	0.02	0.09	0.5
Hide Trucks	2	29	0.12	0.50	2.51	1.0	365	365	0.02	0.09	0.5
Delivery Trucks	10	29	0.12	0.50	2.51	1.0	365	365	0.02	0.09	0.5
Personel Vehicles	400	4	0.02	0.06	0.31	0.4	365	146	0.001	0.005	0.02
							TOTAL EMISSIONS FROM PAVED AREAS		0.13	0.5	2.6

Sulfur Dioxide Calculations - Biogas

Basis:	18,750	scf/hr	Biogas (based on estimated biogas production rate)
	3500	ppmv	Hydrogen Sulfide in Biogas
	538	Btu/scf	Heat Content of Biogas
Flare:	18,750	scf/hr	(max biogas production rate)

Calculation: 3,500 ppmv H2S in Biogas = 0.003500 volume fraction of total Biogas

65.6 scf H2S/hr

(18,750 scf/hr) x (0.003500) = 66 scf H2S/hr

PV = nRT

1 P = pressure, atmospheres

65.6 V = volume, cubic feet

n = lbmoles

0.7302 R = gas constant, atm-cf/lbmoles-deg. R

520 T = temperature, deg. R

For standard pressure and temperature (STP)

T = 32 deg. F, 0 deg. C, 492 deg. R

P = 1 atm.

$$n = \frac{PV}{RT} = \frac{(1\ atm)(65.6\ scf\ H2S/hr)}{(0.7302\ atm\text{-}cf/lbmoles\text{-}deg.\ R)(460+60\ deg.\ R)}$$

$$= 0.172832\ lbmoles\ H2S/hr$$

	H_2S	+	$1\frac{1}{2}O_2$	g	SO_2	+	H_2O
MW	34				64		
lbmoles/hr	0.17				0.17		
lbs/hr	5.88				11.06		

Emission Factor for sulfur dioxide

$$\frac{(11.1\ lbs\ SO2/hr)*(1{,}000{,}000\ scf)}{(18{,}750\ scf\ biogas/hr)*(1\ MMscf)} = 589.9\ lbs\ SO2/MM\ scf\ Biogas\ (uncontrolled)$$

147.5 lbs SO2/MM scf Biogas (controlled, 75% sulfur removal)

0.274 lb SO2/MMBtu biogas

10.09 MMBtu/hr - Heat Input Biogas

APPENDIX B – AMBIENT AIR QUALITY IMPACT ANALYSES

MEMORANDUM

DATE: **February 15**, 2015

TO: **Kelli** Wetzel, Permit Writer, Air Program

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

PROJECT: CS Beef Packers, LLC, (CSBP), Kuna ID, Beef Packaging and rendering plant, Permit to Construct (PTC), P-2015.0018 PROJ61630, Project No. 29-36980A

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

CS Beef Packers (CSBP) submitted an application for a Permit to Construct (PTC) in November, 2015 for a modification to a still unconstructed facility to be located approximately seven miles from Kuna in Ada County, Idaho.

The CSBP facility will have the capacity of processing up to 1,700 head of cattle per day. Modifications to the previous permit application, approved on November 10, 2015, include:

- Increase biogas generation from the anaerobic digester
- Increase biogas routed to boilers (normal operations) and flare (backup operations)
- Evaluation of H_2S removal efficiency
- Relocation of the biogas flare
- Installation of an additional 100 kW emergency generator.

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

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

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

A modeling protocol was not submitted for this project. This application is a modification to a just-completed application from CS Beef, approved on November 10, 2015. RE submitted a new application for a Permit to construct (PTE) on November 16, 2015. The application was determined incomplete by DEQ on December 11, 2015, because of errors in the assigned stack heights for several sources as listed in the modeling files. Shortly afterwards, RE submitted a revised application and new modeling files with corrected stack information. DEQ deemed this application complete on January 8, 2016.

The final submitted air quality impact analyses: 1) utilized appropriate methods and models; 2) was conducted using reasonably accurate or conservative model parameters and input data (review of emissions estimates was addressed by the DEQ permit writer); 3) adhered to established DEQ guidelines for new source review dispersion modeling; 4) showed either a) that predicted pollutant concentrations from emissions associated with the project as modeled were below Significant Impact Levels (SILs) or other applicable regulatory thresholds; or b) that predicted pollutant concentrations from emissions associated with the project as modeled, when appropriately combined with co-contributing sources and background concentrations, were below applicable National Ambient Air Quality Standards (NAAQS) at ambient air

locations where and when the project has a significant impact; 5) showed that Toxic Air Pollutant (TAP) emissions increases associated with the project will not result in increased ambient air impacts exceeding allowable TAP increments.

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

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

Table 1. KEY ASSUMPTIONS USED IN MODELING ANALYSES

Criteria/Assumption/Result	Explanation/Consideration
General Emissions Rates. Emissions rates used in the modeling analyses, as listed in this memorandum, represent maximum potential emissions as given by design capacity or as limited by the issued permit for the specific pollutant and averaging period.	Compliance has not been demonstrated for emissions rates greater than those used in the modeling analyses.
Level I Modeling Thresholds for Criteria Pollutant Emissions. Maximum short-term and long-term emissions of $PM_{2.5}$, PM_{10}, SO_2 , and oxides of nitrogen (NOx) associated with the proposed project are above Level I modeling applicability thresholds as found in State of Idaho Modeling Guidelines.	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 level modeling applicability thresholds. These thresholds are set to assure that impacts are below significant impact levels (SILs). Compliance with NAAQS has not demonstrated for emissions that exceed the emission estimates presented in the application.
TAPS Modeling : Maximum emission rates (as presented in the November 2015 application) of several TAPS per Idaho Air Rules Sections 585 and 586 exceeded Emissions Screening Level (EL) rates.	Air impact analyses demonstrating compliance with TAPS, as required by Idaho Air Rules Section 203.03, is required for pollutants having an emissions rate greater than ELs.

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

The CSBP facility is a state of the art beef packaging and rendering plant, capable of processing up to 1,700 head of cattle a day. Emission units include rendering equipment, material handling, four boilers, wastewater treatment, an emergency generator, and air make-up units. The facility will produce a range of edible beef products and inedible beef byproducts including meat and bone meal, dried blood meal, tallow, and beef hides. A thorough process description is included in Section 2 of the permit application.

A summary of the modifications to the proposed facility are listed in Section 1 of this memorandum.

2.2 Proposed Location and Area Classification

The CSBP facility will be located approximately seven miles east south east of Kuna, Idaho, in Ada County. This area is designated as an attainment or unclassifiable area for sulfur dioxide (SO_2), nitrogen dioxide (NO_2), carbon monoxide (CO), lead (Pb), ozone (O_3), particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers (PM_{10}), and particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers ($PM_{2.5}$). The area is not classified as non-attainment for any criteria pollutants.

2.3 Air Impact Analyses Required for All Permits to Construct

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

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

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

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

2.4 Significant Impact Level and Cumulative NAAQS Impact Analyses

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

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

If modeled maximum pollutant impacts to ambient air from the emissions sources associated with a new

facility or modification exceed the SILs, then a cumulative NAAQS impact analysis is necessary to demonstrate compliance with NAAQS and Idaho Air Rules Section 203.02.

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

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

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

Table 2. APPLICABLE REGULATORY LIMITS

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

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

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

2.5 Toxic Air Pollutant Analyses

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

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

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

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

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

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

3.0 Analytical Methods and Data

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

3.1 Emission Source Data

Emissions rates of criteria pollutants and TAPs for the proposed CSBP Facility were provided by ER 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 ER should be reviewed by the DEQ permit writer against those in the emissions inventory of the permit application. All modeled criteria air pollutant and TAP emissions rates should be equal to or greater than the facility's emissions calculated in other sections of the PTC application or requested permit allowable emission rates.

3.1.1 Criteria Pollutant Emissions Rates and Modeling Applicability

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

NAAQS impact analyses is required. A permit will be issued limiting PTE below 100 ton/year, thereby negating the need to maintain calculated uncontrolled PTE under 100 ton/year.

An impact analysis must be performed for pollutant increases that would not qualify for the BRC exemption from an impact analysis. Facility-wide emissions from operation of the CSBP facility do not qualify for the BRC exclusion because allowable emissions will exceed BRC threshold levels.

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. CSBP elected to do air quality modeling analyses for all pollutants having emissions greater than the Level I Modeling Threshold (PM_{10}, $PM_{2.5}$, SO_2, and NO_x). Tables 4 and 5 list the source specific criteria pollutant emission rates as used in the modeling analyses. All short term periods were modeled with maximum short term emission rates as listed in Table 5.

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
$PM_{2.5}$	24-hour	3.0 lb/hr	1	0.054	0.63	Yes
	Annual	13 ton/yr		0.35	4.1	Yes
PM_{10}	24-hour	3.0 lb/hr	1.5	0.22	2.6	Yes
NOx	1-hour	9.9 lb/hr	4	0.2	2.4	Yes
	Annual	44 ton/yr		1.2	14	Yes
SO_2	1-hour, 3-hour	16.7 lb/hr	4	0.21	2.5	Yes
	24-hour	16.7 lb/hr		0.21	2.5	Yes
	Annual	73 ton/yr		1.2	14	Yes
CO	1-hour, 8-hour	14.6 lb/hr	10	15	175	No
	Annual	58 ton/yr				
Pb	Monthly	7.9E-02 lbs/month		14		No

Emission sources for the CSBP were defined for the following source groups: boilers (four), the emergency generators (two), several Air Make-Up Units (AMUs), rendering equipment, a flare, truck shop heaters, cookers, and a baghouse vent. All sources except the truck shop heaters were treated in the impact analyses as distributed from a series of point sources. The truck heaters were depicted as a volume source. Table 4 lists the annual emissions rates for criteria pollutants as calculated for each source grouping. There are 40 building roof vents (named RFVENT1-RFVENT40) that are treated as point sources and distributed

throughout the facility. These sources contain approximately 81% of the estimated emissions from the AMUs. There are also two packed bed scrubbers (PBS1 and PBS2) located on the facility that contain the remaining 19% of the estimated emissions from the AMUs, and those emissions are contributed by rendering activities and cookers. The remaining sources (baghouse, boilers, flare, and emergency generators) are treated as single point sources. Emissions as modeled per source are listed in Table 5.

Table 4. EMISSIONS FOR EACH SOURCE GROUPS (TPY)						
Source Group	**$PM_{2.5}$**	**PM_{10}**	**NO_2**	**SO_2**	**CO**	**Pb**
Boilers	5.2	5.2	19.8	24.5	20.6	2.58E-05
Baghouse	0.1	0.1	-	-	-	-
Flare	0.3	0.3	3.0	48.4	16.3	2.2E-05
Make-Up Units	3.0	3.9	19.7	0.2	15.0	2.0E-04
Truck Shop Heaters	0.03	0.03	0.4	0.002	0.3	2.0E-06
Rendering	4.4	4.4	0.7	0.01	5.9	9.7E-06
Emergency Generators	0.001	0.001	0.07	6.7E-05	0.1	-

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.

Table 5. CRITERIA EMISSIONS AS MODELED BY SOURCE

Source ID	$PM_{2.5}$ (lb/hr)	PM_{10} (lb/hr)	NO_2 (lb/hr)	SO_2 (lb/hr)	PM_{25} Ann (tpy)	NO_2Ann (tpy)	SO_2Ann (tpy)
BLR_1	0.222	0.222	1.043	0.017	0.973	4.568	0.076
BLR_2	0.222	0.222	1.043	0.017	0.973	4.568	0.076
BLR_3	0.376	0.376	1.211	2.779	1.648	5.305	12.174
BLR_4	0.376	0.376	1.211	2.779	1.648	5.305	12.174
BH1	0.017	0.017			0.077		
FLARE	0.075	0.075	0.686	11.061	0.330	3.003	48.448
RFVENT1	0.019	0.019	0.121	0.001	0.082	0.532	0.006
RFVENT2	0.019	0.019	0.121	0.001	0.082	0.532	0.006
RFVENT3	0.019	0.019	0.121	0.001	0.082	0.532	0.006
RFVENT4	0.019	0.019	0.121	0.001	0.082	0.532	0.006
RFVENT5	0.019	0.019	0.121	0.001	0.082	0.532	0.006
RFVENT6	0.019	0.019	0.121	0.001	0.082	0.532	0.006
RFVENT7	0.019	0.019	0.121	0.001	0.082	0.532	0.006
RFVENT8	0.019	0.019	0.121	0.001	0.082	0.532	0.006
RFVENT9	0.019	0.019	0.121	0.001	0.082	0.532	0.006
RFVENT10	0.019	0.019	0.121	0.001	0.082	0.532	0.006
RFVENT11	0.019	0.019	0.121	0.001	0.082	0.532	0.006
RFVENT12	0.019	0.019	0.121	0.001	0.082	0.532	0.006
RFVENT13	0.019	0.019	0.121	0.001	0.082	0.532	0.006
RFVENT14	0.019	0.019	0.121	0.001	0.082	0.532	0.006
RFVENT15	0.019	0.019	0.121	0.001	0.082	0.532	0.006
RFVENT16	0.019	0.019	0.121	0.001	0.082	0.532	0.006
RFVENT17	0.019	0.019	0.121	0.001	0.082	0.532	0.006
RFVENT18	0.019	0.019	0.121	0.001	0.082	0.532	0.006
RFVENT19	0.019	0.019	0.121	0.001	0.082	0.532	0.006
RFVENT20	0.019	0.019	0.121	0.001	0.082	0.532	0.006
RFVENT21	0.019	0.019	0.121	0.001	0.082	0.532	0.006
RFVENT22	0.019	0.019	0.121	0.001	0.082	0.532	0.006
RFVENT23	0.019	0.019	0.121	0.001	0.082	0.532	0.006
RFVENT24	0.019	0.019	0.121	0.001	0.082	0.532	0.006
RFVENT25	0.019	0.019	0.121	0.001	0.082	0.532	0.006
RFVENT26	0.019	0.019	0.121	0.001	0.082	0.532	0.006
RFVENT27	0.019	0.019	0.121	0.001	0.082	0.532	0.006
RFVENT28	0.019	0.019	0.121	0.001	0.082	0.532	0.006
RFVENT29	0.019	0.019	0.121	0.001	0.082	0.532	0.006
RFVENT30	0.019	0.019	0.121	0.001	0.082	0.532	0.006
PBS3	0.779	0.779	0.583	0.008	3.410	2.552	0.035
PBS4	0.361	0.361	0.425	0.005	1.582	1.863	0.023
EG1	0.011	0.011		0.001	0.001	0.035	0.000
EG2	0.011	0.011		0.001	0.001	0.035	0.000
TruckHTR	0.007	0.007	0.090	0.001	0.031	0.393	0.002

Secondary Particulate Formation

The impact from secondary particulate formation resulting from emissions of NOx, SO_2, and/or VOCs was assumed by DEQ to be negligible on the basis of the magnitude of emissions and the short distance from emissions sources to modeled receptors where maximum PM_{10} and $PM_{2.5}$ impacts would be anticipated.

3.1.2 Toxic Air Pollutant Emissions Rates

TAP emissions regulations under Idaho Air Rules Section 220 are only applicable for new or modified sources constructed after July 1, 1995. The submitted emissions inventory in the May 2015 application identified seven TAPs that potential increases of the Idaho Air Rules Section 586 could exceed screening emissions levels (ELs). Potential increases in emissions of other TAPs were all less than applicable ELs. Table 6 lists emission increases for these TAPs and compares them to the EL, and Table 7 provides source-specific TAP emission rates used in the air impact analyses.

Table 6. MODELED TAP EMISSIONS RATES

Pollutant	CAS No.	Total Emissions Increase (lbs/hr)	EL (lbs/hr)
Arsenic	7440-38-2	4.3E-05	1.50E-06
Cadmium	7440-43-9	2.34E-04	3.70E-06
Chromium (VI)	18540-29-9	1.2E-05	5.60E-07
Formaldehyde	50-00-0	1.7E-02	5.10E-04
Naphthalene	91-20-3	1.3E-04	9.1E-05
Nickel	7440-02-0	4.5E-04	2.7E-05
PAH	PAH	2.5E-06	2.0E-06

3.1.3 Emissions Release Parameters

Table 8 provides emissions release parameters, including stack height, stack diameter, exhaust temperature, and exhaust velocity for point sources as used in the final modeling assessment.

Stack parameters used in the modeling analyses were largely documented/justified in the originally submitted application, as was requested in the DEQ-issued protocol approval notification. Further clarification was provided in email communication between ER and DEQ.

Table 7. TAPS EMISSION RATES PER SOURCE

Source ID	AR[a] (lb/hr)	CD[b] (lb/hr)	CRVI[c] (lb/hr)	FORM[d] (lb/hr)	NAPH[e] (lb/hr)	NI[f] (lb/hr)	PAH[g] (lb/hr)
BLR_1	5.84E-06	3.21E-05	1.64E-06	2.19E-03	1.78E-05	6.14E-05	3.33E-07
BLR_2	5.84E-06	3.21E-05	1.64E-06	2.19E-03	1.78E-05	6.14E-05	3.33E-07
BLR_3	5.91E-06	3.25E-05	1.65E-06	2.22E-03	1.80E-05	6.20E-05	3.37E-07
BLR_4	5.91E-06	3.25E-05	1.65E-06	2.22E-03	1.80E-05	6.20E-05	3.37E-07
RFVENT1	4.90E-07	2.70E-06	1.37E-07	1.84E-04	1.49E-06	5.15E-06	2.79E-08
RFVENT2	4.90E-07	2.70E-06	1.37E-07	1.84E-04	1.49E-06	5.15E-06	2.79E-08
RFVENT3	4.90E-07	2.70E-06	1.37E-07	1.84E-04	1.49E-06	5.15E-06	2.79E-08
RFVENT4	4.90E-07	2.70E-06	1.37E-07	1.84E-04	1.49E-06	5.15E-06	2.79E-08
RFVENT5	4.90E-07	2.70E-06	1.37E-07	1.84E-04	1.49E-06	5.15E-06	2.79E-08
RFVENT6	4.90E-07	2.70E-06	1.37E-07	1.84E-04	1.49E-06	5.15E-06	2.79E-08
RFVENT7	4.90E-07	2.70E-06	1.37E-07	1.84E-04	1.49E-06	5.15E-06	2.79E-08
RFVENT8	4.90E-07	2.70E-06	1.37E-07	1.84E-04	1.49E-06	5.15E-06	2.79E-08
RFVENT9	4.90E-07	2.70E-06	1.37E-07	1.84E-04	1.49E-06	5.15E-06	2.79E-08
RFVENT10	4.90E-07	2.70E-06	1.37E-07	1.84E-04	1.49E-06	5.15E-06	2.79E-08
RFVENT11	4.90E-07	2.70E-06	1.37E-07	1.84E-04	1.49E-06	5.15E-06	2.79E-08
RFVENT12	4.90E-07	2.70E-06	1.37E-07	1.84E-04	1.49E-06	5.15E-06	2.79E-08
RFVENT13	4.90E-07	2.70E-06	1.37E-07	1.84E-04	1.49E-06	5.15E-06	2.79E-08
RFVENT14	4.90E-07	2.70E-06	1.37E-07	1.84E-04	1.49E-06	5.15E-06	2.79E-08

RFVENT15	4.90E-07	2.70E-06	1.37E-07	1.84E-04	1.49E-06	5.15E-06	2.79E-08
RFVENT16	4.90E-07	2.70E-06	1.37E-07	1.84E-04	1.49E-06	5.15E-06	2.79E-08
RFVENT17	4.90E-07	2.70E-06	1.37E-07	1.84E-04	1.49E-06	5.15E-06	2.79E-08
RFVENT18	4.90E-07	2.70E-06	1.37E-07	1.84E-04	1.49E-06	5.15E-06	2.79E-08
RFVENT19	4.90E-07	2.70E-06	1.37E-07	1.84E-04	1.49E-06	5.15E-06	2.79E-08
RFVENT20	4.90E-07	2.70E-06	1.37E-07	1.84E-04	1.49E-06	5.15E-06	2.79E-08
RFVENT21	4.90E-07	2.70E-06	1.37E-07	1.84E-04	1.49E-06	5.15E-06	2.79E-08
RFVENT22	4.90E-07	2.70E-06	1.37E-07	1.84E-04	1.49E-06	5.15E-06	2.79E-08
RFVENT23	4.90E-07	2.70E-06	1.37E-07	1.84E-04	1.49E-06	5.15E-06	2.79E-08
RFVENT24	4.90E-07	2.70E-06	1.37E-07	1.84E-04	1.49E-06	5.15E-06	2.79E-08
RFVENT25	4.90E-07	2.70E-06	1.37E-07	1.84E-04	1.49E-06	5.15E-06	2.79E-08
RFVENT26	4.90E-07	2.70E-06	1.37E-07	1.84E-04	1.49E-06	5.15E-06	2.79E-08
RFVENT27	4.90E-07	2.70E-06	1.37E-07	1.84E-04	1.49E-06	5.15E-06	2.79E-08
RFVENT28	4.90E-07	2.70E-06	1.37E-07	1.84E-04	1.49E-06	5.15E-06	2.79E-08
RFVENT29	4.90E-07	2.70E-06	1.37E-07	1.84E-04	1.49E-06	5.15E-06	2.79E-08
RFVENT30	4.90E-07	2.70E-06	1.37E-07	1.84E-04	1.49E-06	5.15E-06	2.79E-08
PBS3	2.60E-06	1.43E-05	7.27E-07	9.75E-04	7.92E-06	2.73E-05	1.48E-07
PBS4	1.72E-06	9.44E-06	4.80E-07	6.43E-04	5.23E-06	1.80E-05	9.78E-08
EG1	0.00E+00	0.00E+00	0.00E+00	3.66E-04	1.55E-06	0.00E+00	1.53E-08
EG2	0.00E+00	0.00E+00	0.00E+00	3.66E-04	1.55E-06	0.00E+00	1.53E-08
Tankheat	1.80E-07	9.89E-07	5.03E-08	6.74E-05	5.48E-07	1.89E-06	1.02E-08

a. Arsenic
b. Cadmium
c. Chromium +6
d. Formaldehyde
e. Naphthalene
f. Nickel
g. Polyaromatic Hydrocarbons

Table 8. STACK PARAMETERS USED IN MODELING

Source ID	Easting X (m)	Northing Y (m)	Base Elevation (m)	Stack Height (m)	Temp (K)	Exit Velocity (m/s)	Diameter (m)
BLR_1	559011.4	4810857	880.6	19.8	537.9	16.33	0.61
BLR_2	559005.3	4810857	880.6	19.8	537.9	16.33	0.61
BLR_3	558999.2	4810857	880.5	19.8	537.8	18.22	0.61
BLR_4	558993.1	4810857	880.5	19.8	537.8	18.22	0.61
BH1	559091.2	4810798	880.7	17.7	294.3	5.82	0.2
FLARE	559058.2	4810636	880.7	8.9	1273	20	0.49
RFVENT1	558961.7	4810823	880.5	13.4	291.5	13.2	1.07
RFVENT2	558946.2	4810823	880.5	13.4	291.5	13.2	1.07
RFVENT3	558934.9	4810823	880.5	13.4	291.5	13.2	1.07
RFVENT4	558924.1	4810823	880.5	13.4	291.5	13.2	1.07
RFVENT5	558914.9	4810823	880.5	13.4	291.5	13.2	1.07
RFVENT6	558953.6	4810831	880.5	13.4	291.5	13.2	1.07
RFVENT7	558943.8	4810860	880.5	13.4	291.5	13.2	1.07
RFVENT8	558933.4	4810860	880.5	13.4	291.5	13.2	1.07
RFVENT9	558923.7	4810860	880.5	13.4	291.5	13.2	1.07
RFVENT10	558925.8	4810850	880.5	13.4	291.5	13.2	1.07
RFVENT11	558936.1	4810849	880.5	13.4	291.5	13.2	1.07
RFVENT12	558914.8	4810841	880.5	13.4	291.5	13.2	1.07

RFVENT13	558961.2	4810903	880.5	13.4	291.5	13.2	1.07
RFVENT14	558961.2	4810888	880.5	13.4	291.5	13.2	1.07
RFVENT15	558955	4810853	880.5	13.4	291.5	13.2	1.07
RFVENT16	558968.3	4810853	880.5	13.4	291.5	13.2	1.07
RFVENT17	558952.5	4810875	880.5	13.4	291.5	13.2	1.07
RFVENT18	558921.2	4810840	880.5	13.4	291.5	13.2	1.07
RFVENT19	558937.1	4810840	880.5	13.4	291.5	13.2	1.07
RFVENT20	558954.5	4810840	880.5	13.4	291.5	13.2	1.07
RFVENT21	558936.3	4810952	880.5	13.4	291.5	13.2	1.07
RFVENT22	558915.8	4810952	880.5	13.4	291.5	13.2	1.07
RFVENT23	558915.8	4810979	880.5	13.4	291.5	13.2	1.07
RFVENT24	558935.9	4810979	880.5	13.4	291.5	13.2	1.07
RFVENT25	558915.8	4811007	880.5	13.4	291.5	13.2	1.07
RFVENT26	558935.8	4811007	880.5	13.4	291.5	13.2	1.07
RFVENT27	558899.9	4810803	880.5	5.8	291.5	13.2	1.07
RFVENT28	558899.4	4810867	880.5	5.8	291.5	13.2	1.07
RFVENT29	558901.6	4810939	880.5	5.8	291.5	13.2	1.07
RFVENT30	558899.5	4811000	880.5	5.8	291.5	13.2	1.07
PBS3	559066	4810838	880.7	15.2	316.5	22.28	1.42
PBS4	559052.5	4810838	880.8	15.2	316.5	22.28	1.42
EG1	558838.5	4810759	880.5	1.4	938.7	50	0.06
EG2	559012.6	4810884	880.4	1.4	938.7	50	0.06

VOLUME Sources						
Volume Source	**Easting X (m)**	**Northing Y (m)**	**Base Elevation (m)**	**Release Height (ft)**	**Initial Dispersion Coefficients**	
					Horiz (m)	**Vert (m)**
Tankheater	559032	4811131	880.7	18	5.12	3.4

3.2 Background Concentrations

Background concentrations were originally provided to ER by DEQ and were obtained from the Northwest International Air Quality Environmental Science and Technology Consortium (NW AIRQUEST) *Lookup 2009-2011 Design Values of Criteria Pollutants*[2]. These design value air pollutant levels are based on regional scale air pollution modeling of Washington, Oregon, and Idaho, with values influenced by monitoring data as a function of distance from the monitor. DEQ has determined that the NW AIRQUEST background values are reasonably representative of the Kuna, Idaho area. NW AIRQUEST background concentration values are provided in Table 9.

Table 9. BACKGROUND CONCENTRATIONS

Pollutant	Averaging Period	NW AIRQUEST Background Concentration ($\mu g/m^3$)[a]
NO_2[b]	1-hour	65.8
	Annual	6.2
PM_{10}[c]	24-hour	49[f]
$PM_{2.5}$[d]	24-hour	17.0
	Annual	6.1
SO_{2e}	1-hour	5.8
	3-hour	9.4
	Annual	1.3

a. Micrograms per cubic meter.
b. Nitrogen dioxide.
c. Particulate matter with a mean aerodynamic diameter of ten microns or less.

d. Particulate matter with a mean aerodynamic diameter of 2.5 microns or less.
e. Sulfur dioxide.
f. Extreme values were removed.

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

ER, on behalf of CSBP, 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 10 provides a brief description of parameters used in the modeling analyses.

Table 10. MODELING PARAMETERS

Parameter	Description/Values	Documentation/Addition Description
General Facility Location	Kuna, ID	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,.
Meteorological Data	Boise Airport surface data and upper air data	The meteorological model input files for this project were provided by and recommended as most representative for this project by IDEQ, as described in the IDEQ modeling protocol and verified by IDEQ's approval of that protocol.
Terrain	Considered	See section 5.3 below
Building Downwash	Considered	BPIP-PRIME was used to evaluate building dimensions for consideration of downwash effects in AERMOD.
NOx Chemistry	Default Tier 2	Default ARM ratio of 0.8 was used for 1 hour NO_2 analyses.
Receptor Grid	**Significant Impact Analyses**	
	Grid 1	10-meter spacing along the ambient air boundary
	Grid 2	25-meter spacing for at least 975 meters from the facility center
	Grid 3	50-meter spacing for at least 1,500 meters from the facility center
	Grid 4	200-meter spacing for at least 2,500 meters from the facility center
	Grid 5	500-meter spacing for at least 5,000 meters from the facility center

3.3.2 Modeling protocol and Methodology

ER did not submit a modeling protocol to DEQ prior to submitting this application in November, 2015. RE followed the procedures outlined in the prior submitted modeling analyses associated with the recently issued PTC for the facility. 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]. ER utilized the default ARM method in the final modeling submittal.

3.3.3 Model Selection

Idaho Air Rules Section 202.02 requires that estimates of ambient concentrations be based on air quality models specified in 40 CFR 51, Appendix W (Guideline on Air Quality Models). The refined, steady state, multiple source Gaussian dispersion model AERMOD was promulgated as the replacement model for

ISCST3 in December 2005. AERMOD retains the single straight line trajectory of ISCST3, but includes more advanced algorithms to assess turbulent mixing processes in the planetary boundary layer for both convective and stable stratified layers.

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

3.3.4 Meteorological Data

ER processed the latest five years (2010-2014) of meteorological data from the National Weather Service Station at the BoiseAirport. This data included both surface and upper air data, and is deemed by DEQ to be adequately representative of the meteorology in the Kuna area for minor source permitting. DEQ reviewed the data and found it to be correctly processed. This data has not yet been approved for use in major source, PSD applications.

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). ER used 1 second data files (about 30-meter resolution), which is sufficient to adequately resolve terrain in the area for evaluating air pollution impacts resulting from emissions.

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 verified proper identification of buildings on the site by comparing a graphical representation of the modeling input file to provided site plans in the application, and compared site locations to those in aerial photographs on Google Earth. The final modeling assessment included revisions to the water tower and pump house as supplied July 29, 2015. The modeled location matched well with aerial photographs in Google Earth as well as from those in the ARCGIS 2013 NAIP database.

3.3.7 Effects of Building Downwash on Modeled Impacts

Potential downwash effects on emissions plumes were 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 used as input to the Building Profile Input Program for the Plume Rise Model Enhancements downwash algorithm (BPIP-PRIME) to calculate direction-specific dimensions

and Good Engineering Practice (GEP) stack height information for input to AERMOD.

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." CSBP will have a fence-line which clearly precludes public access to the facility and defines the ambient boundary for the facility.

3.3.9 Receptor Network

Table 10 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.

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.

All point sources were below GEP stack height. Therefore, consideration of downwash caused by nearby buildings was required.

4.0 Impact Modeling Results

4.1 Results for NAAQS Significant Impact Level Analyses

All criteria pollutant emission increases associated with the proposed project above the Level I Modeling Applicability Thresholds were modeled to show project-specific compliance with the NAAQS. These thresholds, based on modeling of a single emissions stack with specified release parameters, were established to assure that impacts of projects when emissions equal to or less than these levels will not cause impacts exceeding the SILs. Since the emission increases associated with the proposed project are above these threshold values, a project-specific air impact analysis was required to demonstrate NAAQS compliance for issuance of the PTC. All modeled impacts were above the SIL for each pollutant, as shown in Table 11. Results of the NAAQS modeling analyses as provided in the application are listed in Table 12 and demonstrate compliance with the NAAQS for all pollutants to DEQ's satisfaction. The values listed in Table

12 were obtained from verification runs made by DEQ to assure compliance with the NAAQS.

Table 11. RESULTS FOR SIGNIFICANT IMPACT ANALYSES					
Pollutant	**Averaging Period**	**Maximum Modeled Concentration ($\mu g/m^3$)[a]**	**Significant Impact Level ($\mu g/m^3$)**	**% of SIL**	**NAAQS ($\mu g/m^3$)**
$PM_{2.5}$	24-hour	5.5 [a]	1.2	458	35
	Annual	1.5 [b]	0.3	533	12
PM_{10} [c]	24-hour	5.5	5	110	150
NO_2 [d]	1-hour	133.0[e]	7.5	1773	188
	Annual	6.7	1	670	100
SO_2	1-hour	112	7.8	1436	196
	3-hour	100.9	25	404	1,300
	Annual	7.1	1	710	80

a. Highest max any year
b. Highest annual average any year.
c. Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers.
d. Nitrogen dioxide.
e. Maximum 1 hour values averaged over eight years.; Tier 2 factor of 80% applied to maximum value.

Table 12. RESULTS FOR NAAQS ANALYSES					
Pollutant	**Averaging Period**	**Modeled Design Concentration ($\mu g/m^3$)[a]**	**Background Concentration ($\mu g/m^3$)**	**Total Concentration ($\mu g/m^3$)**	**NAAQS ($\mu g/m^3$)**
$PM_{2.5}$	24-hour	4.4 [a]	17.0	21.4	35
	Annual	1.5 [b]	6.1	7.6	12
PM_{10}	24-hour	5.5	49	54.5	150
NO_2 [d]	1-hour	108.1[e]	65.8	173.6	188
	Annual	6.7	6.2	12.9	100
SO_2	1-hour	105.4	5.8	111.2	196
	3-hour	100.4	9.4	109.8	1,300
	Annual	7.1	1.3	8.4	80

a.
b.
c.
d.
e.

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). The November 2015 application identified seven TAPs that required modeling analysis. The results of the TAPs analyses are listed in Table 13. The predicted ambient TAPs impacts were considerably below any TAPs increments. The TAP emission rates as modeled are listed in Table 7.

Table 13. TAP MODELING RESULTS

Pollutant	CAS No.	Average	Modeled Conc. ($\mu g/m^3$)	AAC/AAAC ($\mu g/m^3$)	%AAC/AAAC
Arsenic	7440-38-2	Annual	3.0E-05	2.3E-04	13%
Cadmium	7440-43-9	Annual	1.9E-04	5.6E-04	34%
Chromium (VI)	18540-29-9	Annual	1.0E-05	8.30E-05	12%
Formaldehyde	50-00-0	Annual	1.5E-02	7.7E-02	20%
Naphthalene	91-20-3	Annual	1.1E-04	1.4E-02	1%
Nickel	7440-02-0	Annual	3.7E-04	4.2E-03	9%
PAH	PAH	Annual	2.0E-06	1.4E-02	<1%

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 proposed CSBF 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.

2. Air Quality Environmental Science and Technology Consortium (NW AIRQUEST). *Lookup 2009-2011 Design Values of Criteria Pollutants.* Available at: http://lar.wsu.edu/nw-airquest/lookup.html.

APPENDIX C – FACILITY DRAFT COMMENTS

The following comments were received from the facility on March 16, 2016:

Facility Comment: In the Statement of Basis description, change text to read two emergency generators instead of one.

DEQ Response: The requested change has been made.

Facility Comment: In the Statement of Basis potential to emit, change text to read two emergency generators instead of one.

DEQ Response: The requested change has been made.

Facility Comment: In the Statement of Basis permit conditions review, change text to read minimum H_2S removal efficiency.

DEQ Response: The requested change has been made.

APPENDIX D – PROCESSING FEE

PTC Fee Calculation

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

Company: CS Beef Packers, LLC
Address: 17365 S. Cole Rd
City: Kuna
State: Idaho
Zip Code: 83634
Facility Contact: Chelly Reesman
Title: Environmental Engineering Manager
AIRS No.: 001-00323

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	2.4	0	2.4
SO_2	61.4	0	61.4
CO	12.7	0	12.7
PM10	0.2	0	0.2
VOC	4.8	0	4.8
TAPS/HAPS	0.0	0	0.0
Total:	0.0	0	**81.5**
Fee Due	**$ 5,000.00**		

Comments: