Statement of Basis

Permit to Construct No. P-2011.0141
Project ID 62651

J R Simplot Co. - Caldwell Facility
Caldwell, Idaho

Facility ID 027-00131

Final

October 15, 2021
Zach Pierce
Permit Writer

ZP

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

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ACRONYMS, UNITS, AND CHEMICAL NOMENCLATURE

AAC	acceptable ambient concentrations
AACC	acceptable ambient concentrations for carcinogens
acfm	actual cubic feet per minute
ASTM	American Society for Testing and Materials
Btu	British thermal units
CAA	Clean Air Act
CAM	Compliance Assurance Monitoring
CEMS	continuous emission monitoring systems
cfm	cubic feet per minute
CFR	Code of Federal Regulations
CI	compression ignition
CMS	continuous monitoring systems
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	CO_2 equivalent emissions
COMS	continuous opacity monitoring systems
DEQ	Department of Environmental Quality
dscf	dry standard cubic feet
EL	screening emission levels
EPA	U.S. Environmental Protection Agency
gph	gallons per hour
gpm	gallons per minute
gr	grains (1 lb = 7,000 grains)
HAP	hazardous air pollutants
HHV	higher heating value
hp	horsepower
hr/yr	hours per consecutive 12 calendar month period
ICE	internal combustion engines
IDAPA	a numbering designation for all administrative rules in Idaho promulgated in accordance with the Idaho Administrative Procedures Act
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
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

PTC	permit to construct
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
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

The J R Simplot Caldwell facility will produce par-fried French fries that will include both battered and unbatttered products, par-fried preformed potato products, and shredded potatoes using the same general process as the existing plant uses.

Trucks will transport raw potatoes to the facility where the potatoes will be unloaded inside the enclosed receiving area within the processing building. The potatoes are mechanically sorted by size and, during harvest season, randomly inspected. After sorting and inspection, the potatoes are transported to one of the facility's five production lines. Steam peelers remove the potato peels for most product cuts prior to being sliced into various shapes and lengths. After the potatoes are cut and sorted into different lengths, they are dipped into hot water blancher tanks to remove the excess sugars.

The potato products for Lines 1, 2, 3, 4, and 5 will be conveyed to dryers to remove surface moisture. Once the surface moisture is removed, the potatoes in Line 1 and Line 4 will be conveyed to the Line 1 and Line 4 fryers. Line 2 and Line 3 potatoes will be formed into preformed potato products before being conveyed to the Line 2 and Line 3 fryers. Following the frying process, the final potato products will be frozen and packaged for shipping. The dryers from Lines 1-4 and fryers from Lines 1-5 will be heated using steam from the boilers. The dryer in Line 5 will be natural gas-fired. Process emissions from the fryers in Line 1-5 and from the dryers in Line 2 and Line 3 will be routed to the RTO to minimize particulate matter and volatile organic compounds emitted to the atmosphere.

Steam for process needs and building heat is provided by three boilers each rated at 98 million British thermal units per hour (MMBtu/hr) on a higher heating value (HHV) basis. Simplot also operates an anaerobic digester and associated flare. Emergency internal combustion (IC) emergency engines provide power and firewater in case of an emergency.

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).

<u>Old Plant</u>

December 17, 1997	PTC No. 027-00009, PTC for anaerobic digester biogas flare, Permit Status (S)
December 31, 1997	PTC No. 027-00009, PTC modification to line 5 fryer, Permit Status (S)
December 10, 2001	PTC No. 027-00009, PTC for ADI-BVF anaerobic digester with biogas flare, Permit Status (S)
October 4, 2002	Tier I Operating Permit No. 027-00009, Initial Tier I operating permit, Permit Status (S)
October 17, 2003	PTC No. P-030013, PTC for an ethanol production plant, Permit Status (Cancelled)
October 17, 2003	PTC No. P-030014, PTC revision for PTC No. 027-00009, Permit Status (S)
June 21, 2004	T1-030015, Tier I operating permit incorporating PTC No. 027-00009, PTC No. P-030013, PTC No. P-030014, and a consent order issued in 1999, Permit Status (S)
December 22, 2005	PTC No. P-050016, PTC revision to replace the wet scrubber at the Line 1 fryer with wet ESP, Permit Status (S)
June 14, 2006	PTC No. P-060025, Mandates the two Cleaver-Brooks boilers to operate using natural gas exclusively, Permit Status (S)
September 6, 2007	PTC No. P-2007.0073, PTC modification to change Line 4 fryer from processing French fries to pre-formed potato product and removal of Line 4 dryer, Permit Status (A)
January 17, 2007	T1-050013, Renewal of Tier I permit, Permit Status (S)

March 8, 2007	T1-2007.0010, Administrative amendment, Permit Status (S)
April 25, 2007	T1-2007.0042, Administrative amendment, Permit Status (S)
December 7, 2007	PTC No. P-2007.0222, PTC revision of PTC No. P-060025 for the replacement of an existing natural gas fired boiler, Permit Status (S)
July 11, 2008	PTC No. P-2008.0091, PTC modification to replace Boiler No. 10 with Boiler No. 1, Permit Status (S)
October 26, 2009	T1-2009.0119, Administrative amendment, Permit Status (S)
January 29, 2010	PTC No. P-2009.0136, PTC revision to operate an additional burner in Boiler No. 1 and remove temporary Boiler No. 11, Permit Status (S)
February 4, 2011	T1-2009.0119, Administrative amendment, Permit Status (S)
February 13, 2012	T1-2011.0117 Tier I permit renewal (S)

New Plant

April 4, 2012	PTC No. P-2011.0141, Initial PTC for a new potato processing plant that allows operating of some existing equipment during the commissioning period (S)
January 6, 2014	PTC No. P-2011.0141, Modification of Initial Permit to accommodate an alternative commissioning period operating scenario (S)
November 5, 2015	PTC No. P-2011.0141, Modification of permit to increase in allowable potato production rates in process Line 1 and Line 4 (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 a new conventional fry line (Line 5), including: a natural gas-heated dryer, a steam-heated fryer, and other non-emitting equipment.
- Limit the annual mainline throughput to 532,000 tons of finished product per year to keep VOC below major source threshold of 100 T/yr.
- Revise the mainline dryers (Line 1 and Line 4) exhaust to vent directly to the atmosphere instead of through the RTO.

Application Chronology

June 23, 2021	DEQ received an application and an application fee.
June 29 – July 14, 2021	DEQ provided an opportunity to request a public comment period on the application and proposed permitting action.
July 22, 2021	DEQ determined that the application was complete.
September 14, 2021	DEQ made available the draft permit and statement of basis for peer and regional office review.
September 17, 2021	DEQ made available the draft permit and statement of basis for applicant review.
October 5, 2021	DEQ received the permit processing fee.
October 15, 2021	DEQ issued the final permit and statement of basis.

TECHNICAL ANALYSIS

Emissions Units and Control Equipment

Table 1 EMISSIONS UNIT AND CONTROL EQUIPMENT INFORMATION

Sources	Control Equipment	Emission Point ID No.
Line 2 and 3 Dryers Line 1-5 Fryers	RTO (Maximum Heat input 25.2 MMBtu/hr - NG)	Exit height: 85 ft Exit diameter: 7 ft Exit temperature: 271 °F
Line 1 Dryers	None	Exit height: 55.5 ft Exit diameter: 2.08 ft Exit temperature: 106 °F
Line 4 Dryers	None	Exit height: 55.5 ft Exit diameter: 2.08 ft Exit temperature: 106 °F
Line 5 Dryers (New) Fuel: Natural Gas Heat input rating: 12.8 MMBtu/hr	Low NO_X Burner	Exit height: 55.5 ft Exit diameter: 1.83 ft Exit temperature: 120 °F
Boiler A 98 MMBtu/hr Fuel: Natural Gas	Low NO_x Burner	Exit height: 70 ft Exit diameter: 3.51 ft Exit temperature: 140 °F
Boiler B & C 98 MMBtu/hr (each boiler) Fuel: Natural Gas & Biogas	Low NO_x Burner	Exit height: 70 ft Exit diameter: 3.51 ft Exit temperature: 140 °F
Anaerobic Digester Biogas	Flare, or Iron Sponge H2S Removal System and Boilers B & C	Exit height: 32.8 ft Exit diameter: 2.23 ft Exit temperature: 1,832 °F
Generator (unit 4) – Emergency, Warehouse A Manufacturer: Onan 55 hp Fuel: Natural Gas	None	Exit height: 44.0 ft Exit diameter: 0.16 ft Exit temperature: 1,060 °F
Generator (unit 5)– Emergency, Greenhouse Manufacturer: Olympian 68 hp Fuel: Natural Gas	None	Exit height: 4.9 ft Exit diameter: 0.16 ft Exit temperature: 1,080 °F
Generator (unit 1) – Emergency, Wastewater Treatment Manufacturer: Onan 166 hp Fuel: Diesel	None	Exit height: 7.9 ft Exit diameter: 0.20 ft Exit temperature: 1,060 °F
Generator (unit 3) – Emergency, Tech Center Manufacturer: Dayton 14.8 hp Fuel: Natural Gas	None	Exit height: 41.3 ft Exit diameter: 0.20 ft Exit temperature: 1,080 °F
Fire Water Pump Engine (unit 2) Manufacturer: Cummins 287hp Fuel: Diesel	None	Exit height: 12.1 ft Exit diameter: 0.43 ft Exit temperature: 850 °F

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 potato product line operations at the facility (see Appendix A) associated with this proposed project. Emissions estimates of criteria pollutant, HAP PTE were based on emission factors from AP-42, operation of 8,760 hours per year, and process information specific to the facility for this proposed project.

Pre-Project Potential to Emit

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

The following table presents the pre-project potential to emit for all criteria pollutants for the units being modified 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	
	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)]
RTO (Dryers 1-4 & Fryers 1-4)	7.77	34.05	0.015	0.06	2.52	11.04	2.08	9.09	5.53	24.2
Pre-Project Totals	**7.77**	**34.05**	**0.02**	**0.06**	**2.52**	**11.04**	**2.08**	**9.09**	**5.53**	**24.20**

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

Post Project Potential to Emit

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

The following table presents the post project Potential to Emit for criteria pollutants for the units being modified as submitted by the Applicant and verified by DEQ staff. See Appendix A for a detailed presentation of the calculations of these emissions for each emissions unit.

Table 3 POST PROJECT POTENTIAL TO EMIT FOR REGULATED AIR POLLUTANTS

Source	$PM_{10}/PM_{2.5}$		SO_2		NO_X		CO		VOC	
	lb/hr[(a)]	T/yr[(b)]	lb/hr[(a)]	T/yr[(b)]	lb/hr[(a)]	T/yr[(b)]	lb/hr[(a)]	T/yr[(b)]	lb/hr[(a)]	T/yr[(b)]
RTO (Dryers 2-3 & Fryers 1-5)	5.97	20.38	0.015	0.06	2.52	11.04	2.08	9.09	3.26	11.92
Line 1 Dryers	0.20	0.61	0.00	0.00	0.00	0.00	0.00	0.00	8.62	26.3
Line 4 Dryers	0.20	0.61	0.00	0.00	0.00	0.00	0.00	0.00	8.62	26.3
Line 5 Dryers	0.21	0.78	0.01	0.03	0.47	2.04	0.76	3.32	5.21	16.01
Post Project Totals	**6.58**	**22.38**	**0.03**	**0.09**	**2.99**	**13.08**	**2.84**	**12.41**	**25.71**	**80.53**

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	
	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	7.77	34.05	0.02	0.06	2.52	11.04	2.08	9.09	5.53	24.20
Post Project Potential to Emit	6.58	22.38	0.03	0.09	2.99	13.08	2.84	12.41	25.71	80.63
Changes in Potential to Emit	**-1.19**	**-11.67**	**0.01**	**0.03**	**0.47**	**2.04**	**0.76**	**3.32**	**20.18**	**56.43**

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)
Ammonia	1.0	1.04	4.0E-02	1.2	No
Dichlorobenzene	3.8E-04	3.91E-04	1.5E-05	30.0	No
Hexane	0.6	0.59	2.3E-02	12.0	No
Naphthalene	1.9E-04	1.99E-04	7.7E-06	3.3	No
Pentane	0.8	0.85	3.3E-02	118.0	No
Toluene	1.1E-03	1.11E-03	4.3E-05	25.0	No
Barium	1.4E-03	1.43E-03	5.5E-05	3.3E-02	No
Chromium-Total	4.4E-04	4.56E-04	1.8E-05	3.3E-02	No
Chromium III	4.2E-04	4.37E-04	1.7E-05	3.3E-02	No
Cobalt	2.6E-05	2.73E-05	1.1E-06	3.3E-03	No
Copper	2.7E-04	2.77E-04	1.1E-05	1.3E-02	No
Manganese	1.2E-04	1.24E-04	4.8E-06	6.7E-02	No
Mercury	8.1E-05	8.46E-05	3.3E-06	1.0E-03	No
Molybdenum	3.4E-04	3.58E-04	1.4E-05	0.3	No
Selenium	7.5E-06	7.81E-06	3.0E-07	1.3E-02	No
Zinc	9.1E-03	9.44E-03	3.6E-04	0.7	No
Nitrous Oxide	0.7	0.72	2.8E-02	6.0	No

All changes in emissions rates for non-carcinogenic TAP were below EL (screening emissions level) as a result of this project. Therefore, modeling is not required for any non-carcinogenic TAP because none of the 24-hour average non-carcinogenic screening ELs identified in IDAPA 58.01.01.585 were exceeded.

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)
3-Methylchloranthrene	5.6E-07	5.9E-07	2.3E-08	2.5E-06	No
Benzene	6.6E-04	6.8E-04	2.6E-05	8.0E-04	No
Benzo(a)pyrene	3.8E-07	3.9E-07	1.5E-08	2.0E-06	No
Formaldehyde	2.3E-02	2.4E-02	9.4E-04	5.1E-04	Yes
Naphthalene (PAH)	1.9E-04	2.0E-04	7.7E-06	9.1E-05	No
Arsenic	6.3E-05	6.5E-05	2.5E-06	1.5E-06	Yes
Beryllium	3.8E-06	3.9E-06	1.5E-07	2.8E-05	No
Cadmium	3.4E-04	3.6E-04	1.4E-05	3.7E-06	Yes
Chromium VI	1.8E-05	1.8E-05	7.0E-07	5.6E-07	Yes
Nickel	6.6E-04	6.8E-04	2.6E-05	2.7E-05	No
PAH	3.6E-06	3.71E-06	1.4E-07	2.0E-06	No

Some of the PTEs for carcinogenic TAP were exceeded as a result of this project. Therefore, modeling is required for Formaldehyde, Arsenic, Cadmium, and Chromium VI because the annual average carcinogenic screening ELs identified in IDAPA 58.01.01.586 were exceeded.

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	1.6E-05
2,2,4-Trimethylpentane	8.8E-06
Acenaphthene (PAH)	2.6E-07
Acenaphthylene (PAH)	1.1E-06
Acetaldehyde	2.6E-04
Acrolein	7.1E-05
Anthracene (PAH)	3.1E-07
Benzo(e)pyrene (PAH)	1.5E-08
Benzo(g,h,i)perylene (PAH)	8.3E-08
Biphenyl (PAH)	7.5E-06
Dichlorobenzene	1.7E-03
Ethylbenzene	1.4E-06
Fluoranthene (PAH)	1.2E-06
Fluorene (PAH)	4.8E-06
Formaldehyde	0.1
Hexane	2.6
Methanol	8.8E-05
Naphthalene	8.9E-04
Phenol	8.4E-07
Phenanthrene (PAH)	4.8E-06
Pyrene (PAH)	7.8E-07
Tetrachloroethane	8.7E-08
Toluene	4.9E-03
Vinyl Chloride	5.2E-07
Xylene	5.1E-05
Arsenic	2.9E-04
Beryllium	1.7E-05

Hazardous Air Pollutants	PTE (T/yr)
Cadmium	1.6E-03
Chromium-Total[(c)]	2.0E-03
Cobalt	1.2E-04
Copper	1.2E-03
Manganese	5.4E-04
Mercury	3.7E-04
Selenium	3.4E-05
Totals	**2.71**

Ambient Air Quality Impact Analyses

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

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 B.

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

REGULATORY ANALYSIS

Attainment Designation (40 CFR 81.313)

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

Facility Classification

The AIRS/AFS facility classification codes are as follows:

For HAPs (Hazardous Air Pollutants) Only:

A = Use when any one HAP has permitted emissions > 10 T/yr or if the aggregate of all HAPS (Total HAPs) has permitted emissions > 25 T/yr.

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

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

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

T/yr of Total HAPs.

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

UNK = Class is unknown.

For All Other Pollutants:

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

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

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

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

UNK = Class is unknown.

Table 8 REGULATED AIR POLLUTANT FACILITY CLASSIFICATION

Pollutant	Uncontrolled PTE (T/yr)	Permitted PTE (T/yr)	Major Source Thresholds (T/yr)	AIRS/AFS Classification
PM_{10}	> 100	32.5	**100**	SM
$PM_{2.5}$	> 100	32.5	**100**	SM
SO_2	>100	92.7	**100**	SM80
NO_X	<100	41.7	**100**	B
CO	<100	82.3	**100**	B
VOC	>100	98.8	**100**	SM80
HAP (single)	<10	0.6	**10**	B
Total HAPs	<25	2.71	**25**	B

Permit to Construct (IDAPA 58.01.01.201)

IDAPA 58.01.01.201... Permit to Construct Required

The permittee has requested that a PTC be issued to the facility for the proposed new emissions source and modified emissions sources. Therefore, a permit to construct is required to be issued in accordance with IDAPA 58.01.01.220. This permitting action was processed in accordance with the procedures of IDAPA 58.01.01.200-228.

Tier II Operating Permit (IDAPA 58.01.01.401)

IDAPA 58.01.01.401... Tier II Operating Permit

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

Visible Emissions (IDAPA 58.01.01.625)

IDAPA 58.01.01.625... Visible Emissions

The sources of PM emissions at this facility are subject to the State of Idaho visible emissions standard of 20% opacity. This requirement is assured by Permit Conditions 2.4 and 3.5.

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. Burning gaseous fuels as the permittee has proposed assures compliance with the grain loading standard; burning natural gas and biogas in the boilers is inherently in compliance with the grain loading standard.

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

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

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

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

- IDAPA 58.01.01.701.01.a: If PW is $< 9{,}250$ lb/hr; $E = 0.045\ (PW)^{0.60}$
- IDAPA 58.01.01.701.01.b: If PW is $\geq 9{,}250$ lb/hr; $E = 1.10\ (PW)^{0.25}$

For equipment that commenced prior to October 1, 1979, the PM allowable emission rate is based on one of the following equations:

- IDAPA 58.01.01.702.01.a: If PW is $< 17{,}000$ lb/hr; $E = 0.045\ (PW)^{0.60}$
- IDAPA 58.01.01.702.01.b: If PW is $\geq 17{,}000$ lb/hr; $E = 1.12\ (PW)^{0.27}$

For the new Line 5 emissions unit proposed to be installed as a result of this project with a proposed throughput of 20 T/hr, E is calculated as follows:

- Proposed throughput = 20 T/hr x 2,000 lb/1 T = 40,000 lb/hr

Therefore, E is calculated as:

- $E = 1.10 \times PW^{0.25} = 1.10 \times (40{,}000)^{0.25} = 15.56$ lb-PM/hr

As presented previously in the Emissions Inventories Section of this evaluation the post project PTE for this emissions unit is 1.00 lb-PM_{10}/hr. Assuming PM is 50% PM_{10} means that PM emissions will be 2.00 lb-PM/hr (1.00 lb-PM_{10}/hr ÷ 0.5 lb-PM_{10}/lb-PM). Therefore, compliance with this requirement has been demonstrated.

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

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

Post project facility-wide emissions from this facility do not have a potential to emit greater than 100 tons per year for PM_{10}, 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.

PSD Classification (40 CFR 52.21)

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

The facility is not a major stationary source as defined in 40 CFR 52.21(b)(1), nor is it undergoing any physical

change at a stationary source not otherwise qualifying under paragraph 40 CFR 52.21(b)(1) as a major stationary source, that would constitute a major stationary source by itself as defined in 40 CFR 52. Therefore in accordance with 40 CFR 52.21(a)(2), PSD requirements are not applicable to this permitting action. The facility is not a designated facility as defined in 40 CFR 52.21(b)(1)(i)(a), and does not have facility-wide emissions of any criteria pollutant that exceed 250 T/yr.

NSPS Applicability (40 CFR 60)

The facility is subject to the requirements of 40 CFR 60 Subpart Dc – Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units.

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

§ 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/hr)) or less, but greater than or equal to 2.9 MW (10 MMBtu/hr).

The proposed steam generating units at the Simplot facility are constructed after June 9, 1989 have input capacities between 10-100 MMBtu and do not qualify for any of the exceptions provided in (d), (e), (f), and (g) of this section. Therefore they are affected emission units and must comply with this Subpart. However, all three boilers at this facility combust gaseous fuel for which there are no emissions standards in this Subpart. Therefore, the only Sections of this subpart that are applicable to the 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) and (i), and the Reporting requirements of § CFR 60.48c(a), (a)(1), and (a)(3).

60.48c(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 SO2standard, 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.

(3) As an alternative to meeting the requirements of paragraph (g)(1) of this section, the owner or operator of an affected facility or multiple affected facilities located on a contiguous property unit where the only fuels combusted in any steam generating unit (including steam generating units not subject to this subpart) at that property are natural gas, wood, distillate oil meeting the most current requirements in §60.42C to use fuel certification to demonstrate compliance with the SO2standard, and/or fuels, excluding coal and residual oil, not subject to an emissions standard (excluding opacity) may elect to record and maintain records of the total amount of each steam generating unit fuel delivered to that property during each calendar month.

60.48c (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.

60.48c (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.

(2) If applicable, a copy of any federally enforceable requirement that limits the annual capacity factor for any fuel or mixture of fuels under §60.42c, or §60.43c.

(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.

NESHAP Applicability (40 CFR 61)

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

MACT/GACT Applicability (40 CFR 63)

The proposed source is not an affected source subject to NESHAP in 40 CFR Part 63, and this permitting action does not alter the applicability status of existing affected sources at the facility.

Permit Conditions Review

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

Revised Permit Condition 2.3

This permit condition has been revised to reflect that the $PM_{2.5}$ emission rate limit has been decreased from 7.8 pounds per hour to 5.97 pounds per hour consistent with the emission inventory and modeling analysis submitted in the application due to the rerouting change from the RTO stack. That is the mainline dryers (Line 1, Line 4, and Line 5) exhausting to vent directly to the atmosphere instead of through the RTO. $PM_{2.5}$ emissions limits for Line 1 Dryer, Line 4 Dryer, and Line 5 Dryer are added to Table 2.2 as they are modeled as separate emissions points. The ambient impact is 93% of 24-hr NAAQS for PM-2.5, meeting the limits are necessary to ensure compliance of the NAAQS. The NO_x emission limit remains unchanged.

Initial Permit Condition 2.4

This permit condition establishes a 20% opacity limit for the associated stacks.

Revised Permit Conditions 2.5 and 2.6

This permit condition has been revised to reflect the addition of processing line (Line 5) and the rerouting from the RTO stack for certain line equipment. Annual production limit has been added to keep VOC emissions below major source threshold of 100 T/yr.

Revised Permit Condition 2.9

This permit condition has been revised to incorporate the necessary steps to demonstrate compliance with the new annual production limit.

Revised Permit Condition 2.11

This permit condition has been revised because Simplot is adding an additional fryer that will be controlled by the RTO. DEQ doesn't know how adding an additional fryer to the RTO will affect the emissions, which is why DEQ thinks resetting the RTO test schedule based on operation of the new fryer would be appropriate. According to the past dryer engineering tests, the emissions from the dryers are very low, so it appears the dryers don't contribute much toward the RTO.

Initial Permit Condition 2.12

This permit condition establishes an initial performance test for the Line 5 dryer stacks to demonstrate compliance with associated emission limits. At the advice of Zach K., DEQ wants confirm the dryer emissions because Simplot used test results for which 19 of the 24 sample results were below the identified method detection limits, and rather than using the detection limit in the calculations, they used values provided by the test contractor that were less than the detection limit. Therefore, it was recommended that Simplot test again after the permit is issued using a minimum of 2-hour test runs to demonstrate compliance with the emission limits (and note that two-hour long test runs with a resulting sample mass that is also below detection would be reasonable demonstration of compliance). The permittee is encouraged to submit a performance test protocol to DEQ for approval of the testing methodology, especially if compliance will be demonstrated using method detection values to avoid exceptionally long test run times that may be needed to collect a measurable sample mass.

Initial Permit Condition 3.4

This permit condition establishes the SO_2 limit for the boilers that fire biogas. This is a limit from an earlier permit issued January 6, 2014 but was left out of the latest permit issued November 5, 2015 with no documentation as to why. The limit ensures compliance with SO_2 NAAQS.

Initial Permit Condition 3.5

This permit condition establishes a 20% opacity limit for the associated stacks.

Revised Permit Condition 3.12

This permit condition has been revised at the request of the permittee to have the language updated to clearly state the boiler test schedule based what tests have already occurred.

PUBLIC REVIEW

Public Comment Opportunity

An opportunity for public comment period on the application was provided in accordance with IDAPA 58.01.01.209.01.c or IDAPA 58.01.01.404.01.c. During this time, there was not a request for a public comment period on DEQ's proposed action. Refer to the chronology for public comment opportunity dates.

APPENDIX A – EMISSIONS INVENTORIES

J.R. Simplot Company - Caldwell Facility

Line 5 Project and Re-Routing Line 1 and Line 4 Dryer Exhausts

532,000 (tons/yr) Line 1, 4, and 5 Annual Throughput Limit

	Line 5 Dryers		Line 1 Dryers		Line 4 Dryers		RTO		Total	
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
Nox	0.47	2.04	--	--	--	--	--	--	0.47	2.04
CO	0.76	3.32	--	--	--	--	--	--	0.76	3.32
SO2	0.01	0.03	--	--	--	--	--	--	0.0075	0.033
PM10	0.21	0.78	0.20	0.61	0.20	0.6	1.00	4.38	1.62	6.39
PM25	0.21	0.78	0.20	0.61	0.20	0.6	1.00	4.38	1.62	6.39
VOCs	5.21	16.01	8.62	26.3	8.62	26.3	0.41	1.78	22.9	70.46
Lead	6.3E-06	2.7E-05	--	--	--	--	--	--	4.67E-03	lb/month

			Line 5 Dryer Combustion						
Project Toxic Air Pollutant Emission Increases									
Non-Carcinogenic TAP (IDAPA 58.01.01.585)	**CASN**	**Ave. Period**	**lb/hr**		**Total lb/hr**	**SEL (lb/hr)**	**Over SEL?**		
Ammonia	7664-41-7	24-Hour	4.0E-02		4.0E-02	1.2	No		
Dichlorobenzene	23521-22-6	24-Hour	1.5E-05		1.5E-05	30.0	No		
Hexane	110-54-3	24-Hour	2.3E-02		2.3E-02	12.0	No		
Naphthalene	91-20-3	24-Hour	7.7E-06		7.7E-06	3.3	No		
Pentane	109-66-0	24-Hour	3.3E-02		3.3E-02	118.0	No		
Toluene	108-88-3	24-Hour	4.3E-05		4.3E-05	25.0	No		
Barium	7440-39-3	24-Hour	5.5E-05		5.5E-05	3.3E-02	No		
Chromium-Total	7440-47-3_Cr	24-Hour	1.8E-05		1.8E-05	3.3E-02	No		
Chromium III	7440-47-3_CrIII	24-Hour	1.7E-05		1.7E-05	3.3E-02	No		
Cobalt	7440-48-4	24-Hour	1.1E-06		1.1E-06	3.3E-03	No		
Copper	7440-50-8	24-Hour	1.1E-05		1.1E-05	1.3E-02	No		
Manganese	7439-96-5	24-Hour	4.8E-06		4.8E-06	6.7E-02	No		
Mercury	7439-97-6	24-Hour	3.3E-06		3.3E-06	1.0E-03	No		
Molybdenum	7439-98-7	24-Hour	1.4E-05		1.4E-05	0.3	No		
Selenium	7782-49-2	24-Hour	3.0E-07		3.0E-07	1.3E-02	No		
Zinc	7440-66-6	24-Hour	3.6E-04		3.6E-04	0.7	No		
Nitrous Oxide	10024-97-2	24-Hour	2.8E-02		2.8E-02	6.0	No		
Carcinogenic TAP (IDAPA 58.01.01.585)	**CASN**	**Ave. Period**	**lb/yr**		**Total lb/yr**	**lb/hr (ann. ave.)**	**SEL (lb/hr)**	**Over SEL?**	**Model ER (g/s, per Dryer Stack)**
3-Methylchloranthrene	91-57-6	Annual	2.0E-04		2.0E-04	2.3E-08	2.5E-06	No	
Benzene	71-43-2	Annual	0.2		0.2	2.6E-05	8.0E-04	No	
Benzo(a)pyrene	50-32-8	Annual	1.3E-04		1.3E-04	1.5E-08	2.0E-06	No	
Formaldehyde	50-00-0	Annual	8.2		8.2	9.4E-04	5.1E-04	Yes	2.96E-05
Naphthalene (PAH)	91-20-3	Annual	6.7E-02		6.7E-02	7.7E-06	9.1E-05	No	
Arsenic	7440-38-2	Annual	2.2E-02		2.2E-02	2.5E-06	1.5E-06	Yes	7.90E-08
Beryllium	7440-41-7	Annual	1.3E-03		1.3E-03	1.5E-07	2.8E-05	No	
Cadmium	7440-43-9	Annual	1.2E-01		1.2E-01	1.4E-05	3.7E-06	Yes	4.35E-07
Chromium VI	7440-47-3_CrVI	Annual	6.2E-03		6.2E-03	7.0E-07	5.6E-07	Yes	2.21E-08
Nickel	7440-02-0	Annual	0.2		0.2	2.6E-05	2.7E-05	No	
Polyaromatic Hydrocarbons (a subset of Toxic Air Pollutants)									
Benz(a)anthracene	56-55-3	-	2.0E-04		2.0E-04	2.3E-08	-	-	
Benzo(a)pyrene	50-32-8	-	1.3E-04		1.3E-04	1.5E-08	-	-	
Benzo(b)fluoranthene	205-99-2	-	2.0E-04		2.0E-04	2.3E-08	-	-	
Benzo(k)fluoranthene	207-08-9	-	2.0E-04		2.0E-04	2.3E-08	-	-	
Chrysene	218-01-9	-	2.0E-04		2.0E-04	2.3E-08	-	-	
Dibenzo(a,h)anthrancene	53-70-3	-	1.3E-04		1.3E-04	1.5E-08	-	-	
Indeno(1,2,3-cd)pyrene	193-39-5	-	2.0E-04		2.0E-04	2.3E-08	-	-	
PAH Total	*PAH*	*Annual*	1.3E-03		**1.3E-03**	**1.4E-07**	**2.0E-06**	No	

J.R. Simplot Company - Caldwell Facility

Line 5 Dryer - Natural Gas Burners

	Boiler Specifications	
Operating hours	8,760 hours/year	
Firing rate	12.8 MMBtu/hr	HHV

Stack Exhaust Flow Information		
F Factor (Natural Gas)	8,710 dscf/MMBtu	Source: EPA Method 19
Exhaust gas volume flow	1,858 dscfm @ 0%O2	
Exhaust gas volume flow - corrected	2,170 dscfm @ 3%O2	Corrected to 3% O2

Criteria and PSD Pollutant Emissions

	Emission Factor		Emission Rate [c]	
Pollutant	ppmvd	lb/MMBtu	lb/hr	tpy
NOx [a]	30 (3% O2)	0.0364	0.47	2.04
CO [a]	80 (3% O2)	0.0591	0.76	3.32
SO2 [b]	--	0.0006	0.008	0.03
PM10 (Filt. & Cond.) [b]	--	0.0075	0.095	0.42
PM2.5 (Filt.& Cond.) [b]	--	0.0075	0.095	0.42
VOC [b]	--	0.0054	0.069	0.30
Lead [b]	--	4.9E-07	6.3E-06	2.7E-05

notes:
a - Proposed NOx and CO ppmvd limits are based on 3% Oxygen.
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 - Hourly emissions based on 12.8 MMBtu/hr, and annual emissions based on 8,760 hrs/yr.

Greenhouse Gas Emissions

	Emission Factor [a]	Emission Rate [b]	
Greenhouse Gas	lb/MMBtu	lb/hr	tpy
CO2	117	1,496	6,553
CH4	2.2E-03	2.8E-02	1.2E-01
N2O	2.2E-04	2.8E-03	1.2E-02
CO2e [c]		1,498	6,560

notes:
a - Greenhouse Gas emission factors from 40 CFR 98, Subpart C, Table C-1.
b - Hourly emissions based on 12.8 MMBtu/hr, and annual emissions based on 8,760 hrs/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).

Toxic Air Pollutant Emissions

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	2.5E-06	0.0
7440-39-3	Barium	4.4E-03	4.3E-06	5.5E-05	0
71-43-2	Benzene	2.1E-03	2.1E-06	2.6E-05	0
7440-41-7	Beryllium	1.2E-05	1.2E-08	1.5E-07	0.001
7440-43-9	Cadmium	1.1E-03	1.1E-06	1.4E-05	0.1
7440-47-3_Cr	Chromium-Total [b]	1.4E-03	1.4E-06	1.8E-05	0.2
7440-47-3_CrIII	Chromium III	1.3E-03	1.3E-06	1.7E-05	0.1
7440-47-3_CrVI	Chromium VI	5.6E-05	5.5E-08	7.0E-07	0.01
7440-48-4	Cobalt	8.4E-05	8.2E-08	1.1E-06	0.01
7440-50-8	Copper	8.5E-04	8.3E-07	1.1E-05	0
50-00-0	Formaldehyde	7.5E-02	7.4E-05	9.4E-04	8
110-54-3	Hexane	1.8E+00	1.8E-03	2.3E-02	198
7439-96-5	Manganese	3.8E-04	3.7E-07	4.8E-06	0.04
7439-97-6	Mercury	2.6E-04	2.5E-07	3.3E-06	0.03
7439-98-7	Molybdenum	1.1E-03	1.1E-06	1.4E-05	0.1
91-20-3	Naphthalene	6.1E-04	6.0E-07	7.7E-06	0.1
7440-02-0	Nickel	2.1E-03	2.1E-06	2.6E-05	0.2
109-66-0	Pentane	2.6E+00	2.5E-03	3.3E-02	286
7782-49-2	Selenium	2.4E-05	2.4E-08	3.0E-07	0.00
108-88-3	Toluene	3.4E-03	3.3E-06	4.3E-05	0.4
10024-97-2	Nitrous Oxide	2.2E+00	2.2E-03	2.8E-02	242
56-55-3	Benz(a)anthracene	1.8E-06	1.8E-09	2.3E-08	0.000
50-32-8	Benzo(a)pyrene	1.2E-06	1.2E-09	1.5E-08	0.000
205-99-2	Benzo(b)fluoranthene	1.8E-06	1.8E-09	2.3E-08	0.000
207-08-9	Benzo(k)fluoranthene	1.8E-06	1.8E-09	2.3E-08	0.000
218-01-9	Chrysene	1.8E-06	1.8E-09	2.3E-08	0.000
53-70-3	Dibenzo(a,h)anthrancene	1.2E-06	1.2E-09	1.5E-08	0.000
193-39-5	Indeno(1,2,3-cd)pyrene	1.8E-06	1.8E-09	2.3E-08	0.000
91-57-6	3-Methylchloranthrene	1.8E-06	1.8E-09	2.3E-08	0.000
23521-22-6	Dichlorobenzene	1.2E-03	1.2E-06	1.5E-05	0.1
7440-66-6	Zinc	2.9E-02	2.8E-05	3.6E-04	3
7664-41-7	Ammonia [c]	3.2E+00	3.1E-03	4.0E-02	352
PAH	PAH (total) [d]	-	-	1.43E-07	0.001

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 - Ammonia emission factor from EPA’s WebFIRE database (http://cfpub.epa.gov/oarweb/index.cfm?action=fire.main)

d - (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.

e - Hourly emissions based on 12.8 MMBtu/hr and annual emissions based on 8,760 hrs/yr.

J.R. Simplot Company - Caldwell Facility

Regenerator Thermal Oxidizer

- Controls Line 5 Fryer (Project Emission Increase)

Operating hours	8,760 hours/year	
Maximum heat input rate (startup)	25.20 MMBtu/hr	Anguil email 10/12/2011
Annual average heat input (SFI Mode)	12.60 MMBtu/hr	Anguil email 10/12/2011

Fryer & Dryer Emissions with Control Efficiencies	
Maximum PM Emissions - Line 5 Fryer	10.0 lb PM/hr
Maximum VOC Emissions - Line 5 Fryer	04.1 lb VOC/hr
PM Destruction Efficiency	90% Control
VOC Destruction Efficiency	90% Control

Criteria and PSD Pollutant Emissions

	RTO Exhaust	
	Emission Rate [a]	
Pollutant	lb/hr	tpy
PM10 (Filt. & Cond.)	1.00	4.38
PM2.5 (Filt.& Cond.)	1.00	4.38
VOC	0.41	1.78

notes:

a - RTO exhaust emissions include line 5 Fryer. Particulate matter and VOC emissions include 90% control (Vendor Guarantee).

J.R. Simplot Company - Caldwell Facility

Caldwell Site

Fryer and dryer uncontrolled emissions

532,000 tons/yr - Con

Simplot source tests

	Source Test Date	PM Front-half emissions Method 5 lbs/hr	PM Back-half emissions Method 202 lbs/hr	PM Total emissions lbs/hr	Production rate finished lbs/hr	VOC Method 25A lbs/hr	Emission Factor EF PM-Total lbs/M lbs	Emission Factor EF VOC lbs/M lbs	Line 1 fryer 67,083 lbs/hr 409,817,714 lb/yr PM Total lbs/hr	Line 1 fryer VOC Total lbs/hr	Line 1 dr 67,083 409,817,714 PM Total lbs/hr
Aberdeen Line 1 batter french fry - fryer uncontrolled	4/28/1998	0.59	2.94	3.53	17,550		0.201		13.49		
Aberdeen Line 2 preform fryer - fryer uncontrolled	6/7/1999	0.52	2.4	2.92	2,400		1.217				
Nampa Main Line batter french fry - Fryerafter heat exchanger	9/15/2005	2.66	3.21	5.87	23,830		0.246		16.52		
Caldwell Line 1 preform fryer - fryer uncontrolled	5/28/1999	1.66	1.4	3.06	6,480		0.472				
Heyburn Line 2 french fry, Fryer Reyco air washed controlled	2/22/2000 fryer, 10/28/2000 dryer	2.9	3.68	6.58	21,690	2.2	0.303	0.101	20.35	6.80	
Heyburn Line 3, preform fryer, fryer Rotoclone controlled	2/15/2000 fryer, 9/21/2000 dryer	0.42	0.71	1.13	2,378	1.12	0.475	0.471			
Caldwell Line 1 preform line dryer	10/16/2000	0.36	0.59	0.95	8,331		0.114				
Caldwell Line 4 french fry line dryer	10/18/2000	3.14	3.11	6.25	34,095		0.183				
Caldwell Line 6 french fry line dryer	10/14/2000	3.03	4.15	7.18	36,211		0.198				
Nampa Main Line dryer	4/10/1995				35,435	7.07		0.200			
Dryer 4 Outlet Ducts	11/19/2019	0.043	0.0337	0.0767	44,974	5.082	0.0030	0.129			0.20
								Hourly (lb/hr)	**16.79**	**6.80**	**0.20**
								Annual (tpy)	**51.28**	**20.78**	**0.61**

Notes:

1. lbs/M lbs for emission factor is lbs of emissions (either PM or VOC) per thousand lbs of finshed potato product
2. In the Simplot source tests, all Production rates are the actual measured finshed potato product rates during the one-hour source test
3. Even though PM and VOC are distinctly different tests, because of the nature of our emissions, they are not additive for total emissions to a control device.
4. Use the **Average** for the input to an RTO unit. The database for uncontrolled emissions from fryers and dryers is very limited.
5. Even though there is data for Heyburn Lines 2 & 3 with Reyco air wash and Rotoclone control, it has always been considered that this control for emissions is minor, th
6. There is no source test data for pre-form dryer VOC, so the french fry dryer VOC emission factor was used as a default value

nbined Throughput Limit (Lines 1, 4, and 5)

yer	Line 2 fryer		Line 2 dryer		Line 3 fryer		Line 3 dryer		Line 4 fryer		Line 4 Dryer	
lbs/hr	11,000 lbs/hr		11,000 lbs/hr		11,000 lbs/hr		11,000 lbs/hr		67,083 lbs/hr		67,083 lbs/hr	
lb/yr	96,360,000 lb/yr		96,360,000 lb/yr		96,360,000 lb/yr		96,360,000 lb/yr		409,817,714 lb/yr		409,817,714 lb/yr	
VOC Total lbs/hr	PM Total lbs/hr	VOC Total lbs/hr	PM Total lbs/hr	VOC Total lbs/hr	PM Total lbs/hr	VOC Total lbs/hr	PM Total lbs/hr	VOC Total lbs/hr	PM Total lbs/hr	VOC Total lbs/hr	PM Total lbs/hr	VOC Total lbs/hr
									13.49			
	13.38				13.38							
									16.52			
	5.19				5.19							
									20.35	6.80		
	5.23	5.18			5.23	5.18						
			0.03				0.03					
				2.19				2.19				
8.62											0.200	8.62
8.62	**7.93**	**5.18**	**0.03**	**2.19**	**7.93**	**5.18**	**0.03**	**2.19**	**16.79**	**6.80**	**0.20**	**8.62**
26.34	**34.76**	**22.69**	**0.14**	**9.61**	**34.76**	**22.69**	**0.14**	**9.61**	**51.28**	**20.78**	**0.61**	**26.34**

ne control was meant for large particles

Caldwell Facility Potential to Emit (TPY)

	Boiler A	Boiler B	Boiler C	Biogas Flare	Line 1, 4, & 5 Dryers Process	Line 5 Dryer Combustion	RTO	Emergency Engines	Solvent and Adhesive Use [e]	Total Potential Emissions
Criteria Air Pollutants										
NOx	7.8	7.8	7.8	4.0	-	2.0	11.0	1.1	-	41.7
CO	15.9	15.9	15.9	22.0	-	3.3	9.1	0.3	-	82.3
SO2	0.25	1.2	1.2	90.0	-	0.03	0.06	4.1E-04	-	92.7
PM10	3.2	3.2	3.2	0.4	1.59	0.4	20.4	0.1	-	32.5
PM2.5	3.2	3.2	3.2	0.4	1.59	0.4	20.4	0.1	-	32.5
VOC	2.3	2.3	2.3	8.3	68.4	0.3	11.9	0.1	2.8	98.8
Pb	2.1E-04	2.1E-04	2.1E-04	2.9E-05	-	2.7E-05	5.4E-05	-	-	7.4E-04
CO2e	50,226	50,226	50,226	11,819	-	6,560	13,436	51	-	182,543

Facility-Wide Toxic Air Pollutants

TAP/HAP	CASN	Ave. Period	Boiler A lb/yr	Boiler B lb/yr	Boiler C lb/yr	Biogas Flare lb/yr	Line 1, 4, & 5 Dryers Process lb/yr	Line 5 Dryer Combustion lb/yr	RTO lb/yr	Emergency Engines lb/yr	Solvent and Adhesive lb/yr	Total lb/yr	Total tpy	HAP?
1,3-Butadiene	106-99-0	Annual	--	--	--	-	-	--	--	3.2E-02	-	3.2E-02	1.6E-05	Yes
2,2,4-Trimethylpentane	540-84-1	24-Hour	--	--	--	-	-	--	--	1.8E-02	-	1.8E-02	8.8E-06	Yes
Acenaphthene (PAH)	83-32-9	Annual	--	--	--	-	-	--	--	5.1E-04	-	5.1E-04	2.6E-07	Yes
Acenaphthylene (PAH)	208-96-8	Annual	--	--	--	-	-	--	--	2.2E-03	-	2.2E-03	1.1E-06	Yes
Acetaldehyde	75-07-0	Annual	--	--	--	-	-	--	--	0.5	-	0.5	2.6E-04	Yes
Acrolein	107-02-8	24-Hour	--	--	--	-	-	--	--	1.4E-01	-	0.1	7.1E-05	Yes
Anthracene (PAH)	120-12-7	Annual	--	--	--	-	-	--	--	6.3E-04	-	6.3E-04	3.1E-07	Yes
Benzo(e)pyrene (PAH)	192-97-2	Annual	--	--	--	-	-	--	--	2.9E-05	-	2.9E-05	1.5E-08	Yes
Benzo(g,h,i)perylene (PAH)	191-24-2	Annual	--	--	--	-	-	--	--	1.7E-04	-	1.7E-04	8.3E-08	Yes
Biphenyl (PAH)	92-52-4	Annual	--	--	--	-	-	--	--	1.5E-02	-	1.5E-02	7.5E-06	Yes
Dichlorobenzene	23521-22-6	24-Hour	1.0	1.0	1.0	-	-	1.3E-01	2.6E-01	--	-	3.4	1.7E-03	Yes
Ethylbenzene	100-41-4	24-Hour	--	--	--	-	-	--	--	2.8E-03	-	2.8E-03	1.4E-06	Yes
Fluoranthene (PAH)	206-44-0	Annual	--	--	--	-	-	--	--	2.5E-03	-	2.5E-03	1.2E-06	Yes
Fluorene (PAH)	86-73-7	Annual	--	--	--	-	-	--	--	9.5E-03	-	9.5E-03	4.8E-06	Yes
Formaldehyde	50-00-0	Annual	63.1	63.1	63.1	-	-	8.2	16.2	2.4	-	216.2	0.1	Yes
Hexane	110-54-3	24-Hour	1515.0	1515.0	1515.0	-	-	197.9	389.6	7.8E-02	-	5132.4	2.6	Yes
Methanol	67-56-1	24-Hour	--	--	--	-	-	--	--	0.2	-	0.2	8.8E-05	Yes
Naphthalene	91-20-3	24-Hour	0.5	0.5	0.5	-	-	6.7E-02	1.3E-01	3.6E-02	-	1.8	8.9E-04	Yes
Phenol	108-95-2	24-Hour	--	--	--	-	-	--	--	1.7E-03	-	1.7E-03	8.4E-07	Yes
Phenanthrene (PAH)	85-01-8	Annual	--	--	--	-	-	--	--	9.6E-03	-	9.6E-03	4.8E-06	Yes
Pyrene (PAH)	129-00-0	Annual	--	--	--	-	-	--	--	1.6E-03	-	1.6E-03	7.8E-07	Yes
Tetrachloroethane	79-34-5	Annual	--	--	--	-	-	--	--	1.7E-04	-	1.7E-04	8.7E-08	Yes
Toluene	108-88-3	24-Hour	2.9	2.9	2.9	-	-	0.4	0.7	0.2	-	9.9	4.9E-03	Yes
Vinyl Chloride	75-01-4	Annual	--	--	--	-	-	--	--	1.0E-03	-	1.0E-03	5.2E-07	Yes
Xylene	1330-20-7	24-Hour	--	--	--	-	-	--	--	1.0E-01	-	0.1	5.1E-05	Yes
Arsenic	7440-38-2	Annual	0.2	0.2	0.2	-	-	2.2E-02	4.3E-02	--	-	0.6	2.9E-04	Yes
Beryllium	7440-41-7	Annual	1.0E-02	1.0E-02	1.0E-02	-	-	1.3E-03	2.6E-03	--	-	3.4E-02	1.7E-05	Yes
Cadmium	7440-43-9	Annual	0.9	0.9	0.9	-	-	1.2E-01	2.4E-01	--	-	3.1	1.6E-03	Yes
Chromium-Total[c]	7440-47-3_Cr	24-Hour	1.2	1.2	1.2	-	-	0.2	3.0E-01	--	-	4.0	2.0E-03	Yes
Cobalt	7440-48-4	24-Hour	0.1	0.1	0.1	-	-	9.2E-03	1.8E-02	--	-	0.2	1.2E-04	Yes
Copper	7440-50-8	24-Hour	0.7	0.7	0.7	-	-	9.3E-02	1.8E-01	--	-	2.4	1.2E-03	Yes
Manganese	7439-96-5	24-Hour	0.3	0.3	0.3	-	-	4.2E-02	8.2E-02	--	-	1.1	5.4E-04	Yes
Mercury	7439-97-6	24-Hour	0.2	0.2	0.2	-	-	2.9E-02	5.6E-02	--	-	0.7	3.7E-04	Yes
Selenium	7782-49-2	24-Hour	2.0E-02	2.0E-02	2.0E-02	-	-	2.6E-03	5.2E-03	--	-	6.8E-02	3.4E-05	Yes
Idaho PAH Group	*POM*	*Annual*	--	--	--	-	-	--	--	5.7E-04	-	**5.7E-04**	**2.8E-07**	**Yes**
												Total HAP	2.7	

J.R. Simplot Company - Caldwell Facility

Boiler A

	Boiler Specifications	
Operating hours	8,760 hours/year	
Firing rate	98.00 MMBtu/hr	HHV

Stack Exhaust Flow Information		
F Factor (Natural Gas)	8,710 dscf/MMBtu	Source: EPA Method 19
Exhaust gas volume flow	14,226 dscfm @ 0%O2	
Exhaust gas volume flow - corrected	16,611 dscfm @ 3%O2	Corrected to 3% O2
Exhaust Temperature	140 F	Estimate - inline condensing economizer creates lower exhaust temp
Exhaust Oxygen	4 % O2	Estimate
Exhaust Moisture	17 % Moisture	Estimate
Exhaust gas volume - estimated actual	24,088 acfm	based on expected operating conditions

Criteria and PSD Pollutant Emissions

	Emission Factor		Emission Rate [b]	
Pollutant	ppmvd	lb/MMBtu	lb/hr	tpy
NOx [a]	15 (3% O2)	0.0182	1.79	7.82
CO [a]	50 (3% O2)	0.0370	3.62	15.87
SO2 [a]	--	0.0006	0.058	0.25
PM10 (Filt. & Cond.) [a]	--	0.0075	0.730	3.20
PM2.5 (Filt.& Cond.) [a]	--	0.0075	0.730	3.20
VOC [a]	--	0.0054	0.528	2.31
Lead [a]	--	4.9E-07	4.8E-05	2.1E-04

notes:

a - Proposed NOx and CO ppmvd limits are based on 3% Oxygen.

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 - Hourly emissions based on 98.0 MMBtu/hr, and annual emissions based on 8,760 hrs/yr.

Greenhouse Gas Emissions

	Emission Factor [a]	Emission Rate [b]	
Greenhouse Gas	lb/MMBtu	lb/hr	tpy
CO2	117	11,455	50,174
CH4	2.2E-03	2.2E-01	9.4E-01
N2O	2.2E-04	2.2E-02	9.4E-02
CO2e [c]		11,467	50,226

notes:

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

b - Hourly emissions based on 98.0 MMBtu/hr, and annual emissions based on 8,760 hrs/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).

Toxic Air Pollutant Emissions

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	1.9E-05	0.2
7440-39-3	Barium	4.4E-03	4.3E-06	4.2E-04	4
71-43-2	Benzene	2.1E-03	2.1E-06	2.0E-04	2
7440-41-7	Beryllium	1.2E-05	1.2E-08	1.2E-06	0.010
7440-43-9	Cadmium	1.1E-03	1.1E-06	1.1E-04	0.9
7440-47-3_Cr	Chromium-Total [b]	1.4E-03	1.4E-06	1.3E-04	1.2
7440-47-3_CrIII	Chromium III	1.3E-03	1.3E-06	1.3E-04	1.1
7440-47-3_CrVI	Chromium VI	5.6E-05	5.5E-08	5.4E-06	0.05
7440-48-4	Cobalt	8.4E-05	8.2E-08	8.1E-06	0.07
7440-50-8	Copper	8.5E-04	8.3E-07	8.2E-05	1
50-00-0	Formaldehyde	7.5E-02	7.4E-05	7.2E-03	63
110-54-3	Hexane	1.8E+00	1.8E-03	1.7E-01	1,515
7439-96-5	Manganese	3.8E-04	3.7E-07	3.7E-05	0.32
7439-97-6	Mercury	2.6E-04	2.5E-07	2.5E-05	0.22
7439-98-7	Molybdenum	1.1E-03	1.1E-06	1.1E-04	0.9
91-20-3	Naphthalene	6.1E-04	6.0E-07	5.9E-05	0.5
7440-02-0	Nickel	2.1E-03	2.1E-06	2.0E-04	1.8
109-66-0	Pentane	2.6E+00	2.5E-03	2.5E-01	2,188
7782-49-2	Selenium	2.4E-05	2.4E-08	2.3E-06	0.02
108-88-3	Toluene	3.4E-03	3.3E-06	3.3E-04	2.9
10024-97-2	Nitrous Oxide	2.2E+00	2.2E-03	2.1E-01	1,852
56-55-3	Benz(a)anthracene	1.8E-06	1.8E-09	1.7E-07	0.002
50-32-8	Benzo(a)pyrene	1.2E-06	1.2E-09	1.2E-07	0.001
205-99-2	Benzo(b)fluoranthene	1.8E-06	1.8E-09	1.7E-07	0.002
207-08-9	Benzo(k)fluoranthene	1.8E-06	1.8E-09	1.7E-07	0.002
218-01-9	Chrysene	1.8E-06	1.8E-09	1.7E-07	0.002
53-70-3	Dibenzo(a,h)anthrancene	1.2E-06	1.2E-09	1.2E-07	0.001
193-39-5	Indeno(1,2,3-cd)pyrene	1.8E-06	1.8E-09	1.7E-07	0.002
91-57-6	3-Methylchloranthrene	1.8E-06	1.8E-09	1.7E-07	0.002
23521-22-6	Dichlorobenzene	1.2E-03	1.2E-06	1.2E-04	1.0
7440-66-6	Zinc	2.9E-02	2.8E-05	2.8E-03	24
7664-41-7	Ammonia [c]	3.2E+00	3.1E-03	3.1E-01	2,693
PAH	PAH (total) [d]	-	-	1.10E-06	0.010

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 - Ammonia emission factor from EPA's WebFIRE database (http://cfpub.epa.gov/oarweb/index.cfm?action=fire.main)

d - (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.

e - Hourly emissions based on 98.0 MMBtu/hr and annual emissions based on 8,760 hrs/yr.

J.R. Simplot Company - Caldwell Facility

Boiler B

	Boiler Specifications	
Operating hours	8,760 hours/year	
Firing rate	98.00 MMBtu/hr	HHV

Stack Exhaust Flow Information		
F Factor (Natural Gas)	8,710 dscf/MMBtu	Source: EPA Method 19
Exhaust gas volume flow	14,226 dscfm @ 0%O2	
Exhaust gas volume flow - corrected	16,611 dscfm @ 3%O2	Corrected to 3% O2
Exhaust Temperature	140 F	Estimate - inline condensing economizer creates lower exhaust temp
Exhaust Oxygen	4 % O2	Estimate
Exhaust Moisture	17 % Moisture	Estimate
Exhaust gas volume - estimated actual	24,088 acfm	based on expected operating conditions

Criteria and PSD Pollutant Emissions

	Emission Factor		Emission Rate [c]	
Pollutant	ppmvd	lb/MMBtu	lb/hr	tpy
NOx [a]	15 (3% O2)	0.0182	1.79	7.82
CO [a]	50 (3% O2)	0.0370	3.62	15.87
SO2 [b]	--	0.0035	0.35	1.15
PM10 (Filt. & Cond.) [b]	--	0.0075	0.730	3.20
PM2.5 (Filt.& Cond.) [b]	--	0.0075	0.730	3.20
VOC [b]	--	0.0054	0.528	2.31
Lead [b]	--	4.9E-07	4.8E-05	2.1E-04

notes:

a - Proposed NOx and CO ppmvd limits are based on 3% Oxygen.

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). Boiler also capable of burning biogas from anaerobic digester: Sulfur scrubber will remove 98 percent of sulfur in biogas, and assume half of biogas will go to Boiler B and half to Boiler C.

c - Hourly emissions based on 98.0 MMBtu/hr, and annual emissions based on 8,760 hrs/yr.

Greenhouse Gas Emissions

	Emission Factor [a]	Emission Rate [b]	
Greenhouse Gas	lb/MMBtu	lb/hr	tpy
CO2	117	11,455	50,174
CH4	2.2E-03	2.2E-01	9.4E-01
N2O	2.2E-04	2.2E-02	9.4E-02
CO2e [c]		11,467	50,226

notes:

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

b - Hourly emissions based on 98.0 MMBtu/hr, and annual emissions based on 8,760 hrs/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).

Toxic Air Pollutant Emissions

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	1.9E-05	0.2
7440-39-3	Barium	4.4E-03	4.3E-06	4.2E-04	4
71-43-2	Benzene	2.1E-03	2.1E-06	2.0E-04	2
7440-41-7	Beryllium	1.2E-05	1.2E-08	1.2E-06	0.010
7440-43-9	Cadmium	1.1E-03	1.1E-06	1.1E-04	0.9
7440-47-3_Cr	Chromium-Total [b]	1.4E-03	1.4E-06	1.3E-04	1.2
7440-47-3_CrIII	Chromium III	1.3E-03	1.3E-06	1.3E-04	1.1
7440-47-3_CrVI	Chromium VI	5.6E-05	5.5E-08	5.4E-06	0.05
7440-48-4	Cobalt	8.4E-05	8.2E-08	8.1E-06	0.07
7440-50-8	Copper	8.5E-04	8.3E-07	8.2E-05	1
50-00-0	Formaldehyde	7.5E-02	7.4E-05	7.2E-03	63
110-54-3	Hexane	1.8E+00	1.8E-03	1.7E-01	1,515
7439-96-5	Manganese	3.8E-04	3.7E-07	3.7E-05	0.32
7439-97-6	Mercury	2.6E-04	2.5E-07	2.5E-05	0.22
7439-98-7	Molybdenum	1.1E-03	1.1E-06	1.1E-04	0.9
91-20-3	Naphthalene	6.1E-04	6.0E-07	5.9E-05	0.5
7440-02-0	Nickel	2.1E-03	2.1E-06	2.0E-04	1.8
109-66-0	Pentane	2.6E+00	2.5E-03	2.5E-01	2,188
7782-49-2	Selenium	2.4E-05	2.4E-08	2.3E-06	0.02
108-88-3	Toluene	3.4E-03	3.3E-06	3.3E-04	2.9
10024-97-2	Nitrous Oxide	2.2E+00	2.2E-03	2.1E-01	1,852
56-55-3	Benz(a)anthracene	1.8E-06	1.8E-09	1.7E-07	0.002
50-32-8	Benzo(a)pyrene	1.2E-06	1.2E-09	1.2E-07	0.001
205-99-2	Benzo(b)fluoranthene	1.8E-06	1.8E-09	1.7E-07	0.002
207-08-9	Benzo(k)fluoranthene	1.8E-06	1.8E-09	1.7E-07	0.002
218-01-9	Chrysene	1.8E-06	1.8E-09	1.7E-07	0.002
53-70-3	Dibenzo(a,h)anthrancene	1.2E-06	1.2E-09	1.2E-07	0.001
193-39-5	Indeno(1,2,3-cd)pyrene	1.8E-06	1.8E-09	1.7E-07	0.002
91-57-6	3-Methylchloranthrene	1.8E-06	1.8E-09	1.7E-07	0.002
23521-22-6	Dichlorobenzene	1.2E-03	1.2E-06	1.2E-04	1.0
7440-66-6	Zinc	2.9E-02	2.8E-05	2.8E-03	24
7664-41-7	Ammonia [c]	3.2E+00	3.1E-03	3.1E-01	2,693
PAH	PAH (total) [d]	-	-	1.1E-06	0.010

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 - Ammonia emission factor from EPA's WebFIRE database (http://cfpub.epa.gov/oarweb/index.cfm?action=fire.main)

d - (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.

e - Hourly emissions based on 98.0 MMBtu/hr and annual emissions based on 8,760 hrs/yr.

J.R. Simplot Company - Caldwell Facility

Boiler C

	Boiler Specifications	
Operating hours	8,760 hours/year	
Firing rate	98.00 MMBtu/hr	HHV

Stack Exhaust Flow Information

F Factor (Natural Gas)	8,710 dscf/MMBtu	Source: EPA Method 19
Exhaust gas volume flow	14,226 dscfm @ 0%O2	
Exhaust gas volume flow - corrected	16,611 dscfm @ 3%O2	Corrected to 3% O2
Exhaust Temperature	140 F	Estimate - inline condensing economizer creates lower exhaust temp
Exhaust Oxygen	4 % O2	Estimate
Exhaust Moisture	17 % Moisture	Estimate
Exhaust gas volume - estimated actual	24,088 acfm	based on expected operating conditions

Criteria and PSD Pollutant Emissions

	Emission Factor		Emission Rate [c]	
Pollutant	ppmvd	lb/MMBtu	lb/hr	tpy
NOx [a]	15 (3% O2)	0.0182	1.79	7.82
CO [a]	50 (3% O2)	0.0370	3.62	15.87
SO2 [b]	--	0.0035	0.35	1.15
PM10 (Filt. & Cond.) [b]	--	0.0075	0.730	3.20
PM2.5 (Filt.& Cond.) [b]	--	0.0075	0.730	3.20
VOC [b]	--	0.0054	0.528	2.31
Lead [b]	--	4.9E-07	4.8E-05	2.1E-04

notes:

a - Proposed NOx and CO ppmvd limits are based on 3% Oxygen.

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). Boiler also capable of burning biogas from anaerobic digester: Sulfur scrubber will remove 98 percent of sulfur in biogas, and assume half of biogas will go to Boiler B and half to Boiler C.

c - Hourly emissions based on 98.0 MMBtu/hr, and annual emissions based on 8,760 hrs/yr.

Greenhouse Gas Emissions

	Emission Factor [a]	Emission Rate [b]	
Greenhouse Gas	lb/MMBtu	lb/hr	tpy
CO2	117	11,455	50,174
CH4	2.2E-03	2.2E-01	9.4E-01
N2O	2.2E-04	2.2E-02	9.4E-02
CO2e [c]		11,467	50,226

notes:

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

b - Hourly emissions based on 98.0 MMBtu/hr, and annual emissions based on 8,760 hrs/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).

Toxic Air Pollutant Emissions

CAS	Compound	Emission Factor [a] lb/mmscf	Emission Factor [a] lb/mmBtu	Emission Rate [e] lb/hr	Emission Rate [e] lb/yr
7440-38-2	Arsenic	2.0E-04	2.0E-07	1.9E-05	0.2
7440-39-3	Barium	4.4E-03	4.3E-06	4.2E-04	4
71-43-2	Benzene	2.1E-03	2.1E-06	2.0E-04	2
7440-41-7	Beryllium	1.2E-05	1.2E-08	1.2E-06	0.010
7440-43-9	Cadmium	1.1E-03	1.1E-06	1.1E-04	0.9
7440-47-3_Cr	Chromium-Total [b]	1.4E-03	1.4E-06	1.3E-04	1.2
7440-47-3_CrIII	Chromium III	1.3E-03	1.3E-06	1.3E-04	1.1
7440-47-3_CrVI	Chromium VI	5.6E-05	5.5E-08	5.4E-06	0.05
7440-48-4	Cobalt	8.4E-05	8.2E-08	8.1E-06	0.07
7440-50-8	Copper	8.5E-04	8.3E-07	8.2E-05	1
50-00-0	Formaldehyde	7.5E-02	7.4E-05	7.2E-03	63
110-54-3	Hexane	1.8E+00	1.8E-03	1.7E-01	1,515
7439-96-5	Manganese	3.8E-04	3.7E-07	3.7E-05	0.32
7439-97-6	Mercury	2.6E-04	2.5E-07	2.5E-05	0.22
7439-98-7	Molybdenum	1.1E-03	1.1E-06	1.1E-04	0.9
91-20-3	Naphthalene	6.1E-04	6.0E-07	5.9E-05	0.5
7440-02-0	Nickel	2.1E-03	2.1E-06	2.0E-04	1.8
109-66-0	Pentane	2.6E+00	2.5E-03	2.5E-01	2,188
7782-49-2	Selenium	2.4E-05	2.4E-08	2.3E-06	0.02
108-88-3	Toluene	3.4E-03	3.3E-06	3.3E-04	2.9
10024-97-2	Nitrous Oxide	2.2E+00	2.2E-03	2.1E-01	1,852
56-55-3	Benz(a)anthracene	1.8E-06	1.8E-09	1.7E-07	0.002
50-32-8	Benzo(a)pyrene	1.2E-06	1.2E-09	1.2E-07	0.001
205-99-2	Benzo(b)fluoranthene	1.8E-06	1.8E-09	1.7E-07	0.002
207-08-9	Benzo(k)fluoranthene	1.8E-06	1.8E-09	1.7E-07	0.002
218-01-9	Chrysene	1.8E-06	1.8E-09	1.7E-07	0.002
53-70-3	Dibenzo(a,h)anthrancene	1.2E-06	1.2E-09	1.2E-07	0.001
193-39-5	Indeno(1,2,3-cd)pyrene	1.8E-06	1.8E-09	1.7E-07	0.002
91-57-6	3-Methylchloranthrene	1.8E-06	1.8E-09	1.7E-07	0.002
23521-22-6	Dichlorobenzene	1.2E-03	1.2E-06	1.2E-04	1.0
7440-66-6	Zinc	2.9E-02	2.8E-05	2.8E-03	24
7664-41-7	Ammonia [c]	3.2E+00	3.1E-03	3.1E-01	2,693
PAH	PAH (total) [d]	-	-	1.10E-06	0.010

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 - Ammonia emission factor from EPA's WebFIRE database (http://cfpub.epa.gov/oarweb/index.cfm?action=fire.main)

d - (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.

e - Hourly emissions based on 98.0 MMBtu/hr and annual emissions based on 8,760 hrs/yr.

J.R. Simplot Company - Caldwell Facility

Regenerator Thermal Oxidizer

- Controls all dryer and fryer emissions.

Operating hours	8,760 hours/year	
Maximum heat input rate (startup)	25.20 MMBtu/hr	Anguil email 10/12/2011
Annual average heat input (SFI Mode)	12.60 MMBtu/hr	Anguil email 10/12/2011

Fryer & Dryer Emissions with Control Efficiencies	
Maximum PM Emissions - Fryers and Dryers	59.5 lb PM/hr
	202.9 tons PM/yr
Maximum VOC Emissions - Fryers and Dryers	32.4 lb VOC/hr
	118.6 tons VOC/yr
PM Destruction Efficiency	90% Control
VOC Destruction Efficiency	90% Control

Stack Exhaust Flow Information	
Exhaust Temperature	111 degree F
Exhaust gas volume	100,000 scfm
Exhaust gas volume - calculated	177,235 acfm

Criteria and PSD Pollutant Emissions

	RTO Burner			RTO Exhaust	
	Emission Factor [a]	Emission Rate [b]		Emission Rate [c]	
Pollutant	lb/MMBtu	lb/hr	tpy	lb/hr	tpy
NOx	0.1000	2.52	11.04	2.52	11.04
CO	0.0824	2.08	9.09	2.08	9.09
SO2	0.0006	0.015	0.06	1.5E-02	0.06
PM10 (Filt. & Cond.)	0.0075	0.188	0.82	5.97	20.38
PM2.5 (Filt.& Cond.)	0.0075	0.188	0.82	5.97	20.38
VOC	0.0054	0.136	0.60	3.26	11.92
Lead	4.9E-07	1.2E-05	5.4E-05	1.2E-05	5.4E-05

notes:

a - NOx emission factor for Maxon Kinemax burners. All other criteria pollutant 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 - RTO Burner emissions based on 25.2 MMBtu/hr, and annual emissions based on 8,760 hrs/yr.

c - RTO exhaust emissions include RTO burner, Dryer Lines 1 - 4, and Fryer Lines 1 - 4. Particulate matter and VOC emissions include 90% control (Vendor Guarantee).

Greenhouse Gas Emissions

	Fryer & Dryer Gas [a]	NG Emission Factor [b]	RTO Burner Emission Rate [c]	
Greenhouse Gas	lb/hr	lb/MMBtu	lb/hr	tpy
CO2	119	117	3,064	13,422
CH4	--	2.2E-03	5.5E-02	2.4E-01
N2O	--	2.2E-04	5.5E-03	2.4E-02
CO2e [d]			3,068	13,436

notes:

a - Greenhouse Gas emissions from converting VOC in fryer and dryer exhaust to CO2. VOC emissions assumed to be as carbon basis and conservatively assume 100 percent conversion to CO2.

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

c - Hourly emissions based on 25.2 MMBtu/hr, and annual emissions based on 8,760 hrs/yr.

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).

Toxic Air Pollutant Emissions

CAS	Compound	Emission Factor [a]		RTO Burner Emission Rate [e]	
		lb/mmscf	lb/mmBtu	lb/hr	lb/yr
7440-38-2	Arsenic	2.0E-04	2.0E-07	4.9E-06	4.3E-02
7440-39-3	Barium	4.4E-03	4.3E-06	1.1E-04	9.5E-01
71-43-2	Benzene	2.1E-03	2.1E-06	5.2E-05	4.5E-01
7440-41-7	Beryllium	1.2E-05	1.2E-08	3.0E-07	2.6E-03
7440-43-9	Cadmium	1.1E-03	1.1E-06	2.7E-05	2.4E-01
7440-47-3_Cr	Chromium-Total [b]	1.4E-03	1.4E-06	3.5E-05	3.0E-01
7440-47-3_CrIII	Chromium III	1.3E-03	1.3E-06	3.3E-05	2.9E-01
7440-47-3_CrVI	Chromium VI	5.6E-05	5.5E-08	1.4E-06	1.2E-02
7440-48-4	Cobalt	8.4E-05	8.2E-08	2.1E-06	1.8E-02
7440-50-8	Copper	8.5E-04	8.3E-07	2.1E-05	1.8E-01
50-00-0	Formaldehyde	7.5E-02	7.4E-05	1.9E-03	1.6E+01
110-54-3	Hexane	1.8E+00	1.8E-03	4.4E-02	3.9E+02
7439-96-5	Manganese	3.8E-04	3.7E-07	9.4E-06	0.08
7439-97-6	Mercury	2.6E-04	2.5E-07	6.4E-06	0.06
7439-98-7	Molybdenum	1.1E-03	1.1E-06	2.7E-05	2.4E-01
91-20-3	Naphthalene	6.1E-04	6.0E-07	1.5E-05	1.3E-01
7440-02-0	Nickel	2.1E-03	2.1E-06	5.2E-05	4.5E-01
109-66-0	Pentane	2.6E+00	2.5E-03	6.4E-02	5.6E+02
7782-49-2	Selenium	2.4E-05	2.4E-08	5.9E-07	5.2E-03
108-88-3	Toluene	3.4E-03	3.3E-06	8.4E-05	7.4E-01
10024-97-2	Nitrous Oxide	2.2E+00	2.2E-03	5.4E-02	4.8E+02
56-55-3	Benz(a)anthracene	1.8E-06	1.8E-09	4.4E-08	3.9E-04
50-32-8	Benzo(a)pyrene	1.2E-06	1.2E-09	3.0E-08	2.6E-04
205-99-2	Benzo(b)fluoranthene	1.8E-06	1.8E-09	4.4E-08	3.9E-04
207-08-9	Benzo(k)fluoranthene	1.8E-06	1.8E-09	4.4E-08	3.9E-04
218-01-9	Chrysene	1.8E-06	1.8E-09	4.4E-08	3.9E-04
53-70-3	Dibenzo(a,h)anthrancene	1.2E-06	1.2E-09	3.0E-08	2.6E-04
193-39-5	Indeno(1,2,3-cd)pyrene	1.8E-06	1.8E-09	4.4E-08	3.9E-04
91-57-6	3-Methylchloranthrene	1.8E-06	1.8E-09	4.4E-08	3.9E-04
23521-22-6	Dichlorobenzene	1.2E-03	1.2E-06	3.0E-05	2.6E-01
7440-66-6	Zinc	2.9E-02	2.8E-05	7.2E-04	6.3E+00
7664-41-7	Ammonia [c]	3.2E+00	3.1E-03	7.9E-02	6.9E+02
PAH	PAH (total) [d]	-	-	2.82E-07	2.47E-03

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 - Ammonia emission factor from EPA’s WebFIRE database (http://cfpub.epa.gov/oarweb/index.cfm?action=fire.main)

d - (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,

e - Hourly emissions based on 25.2 MMBtu/hr and annual emissions based on 8,760 hrs/yr.

J.R. Simplot Company - Caldwell Facility

BIOGAS FLARE

Pollutant	Emission Factor (lb/MMscf)	Emission Factor (lb/MMBtu)[c]	Potential to Emit lb/hr	Potential to Emit TPY
NOx	-	0.068	1.3	4.0
CO	-	0.37	7.0	22.0
SO2[a]	908.7	-	28.8	90.0
PM-10 [b]	-	7.5E-03	0.14	0.4
PM-2.5 [b]	-	7.5E-03	0.14	0.4
VOC	-	0.14	2.7	8.3
Lead [b]	-	4.9E-07	9.3E-06	2.9E-05

Biogas Flow Rate - Hrly	0.03174	MMscf/hr
Biogas Flow Rate - Ann.	198.1	MMscf/yr
Biogas Heat Content	600	btu/scf
Flare Heat Capacity - ST	19.0	MMBtu/hr
Flare Heat Capacity - LT	118,856	MMBtu/yr

Notes:
(a) The SO2 emission factor based on permit limit of H2S in the biogas (5,391 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	119,256	--	3,785	11,812
CH4	--	2.2E-03	4.2E-02	1.3E-01
N2O	--	2.2E-04	4.2E-03	1.3E-02
CO2e [c]			3,787	11,819

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 19.0 MMBtu/hr and 0.032 MMscf/hr, and annual emissions based on 118,856 MMBtu/yr and 198 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]		short-term	long-term
Total Heat release	cal/s	1,333,950	950,380
Radiative Heat Loss	%	65.0	65.0
Net Heat Release	cal/s	466,882	332,633
Effective Stack Diameter	m	0.68	0.57
Physical Stack Height	m	6.1	6.1
Effective Stack Height	m	10.0	9.4

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).

J.R. Simplot Company - Caldwell Facility

EG1 - Natural Gas Generator

- 25kW Onan #30.0SR-15R/2160A, at Warehouse A (palletizer area)

	Generator Specifications	
Operating hours	100 hours/year	
Firing rate	0.46 MMBtu/hr	Generator Spec. Sheet
Testing Limited to	30 min/day	
- Limit on specific hours to test	(12pm - 7pm)	

Criteria and PSD Pollutant Emissions

Pollutant	Emission Factor (lb/MMBtu)[(a)]	Potential to Emit [(b)]		
		lb/hr	lb/hr (24-hr ave)	TPY
NOx	0.85	0.2	--	0.02
CO	0.557	0.1	--	0.01
SO2	0.000588	1.4E-04	--	1.4E-05
PM-10	0.010	0.002	9.6E-05	2.3E-04
PM-2.5	0.010	0.002	9.6E-05	2.3E-04
VOC	0.12	0.03	--	2.7E-03

a - Emission factors from AP-42 Section 3.2 for 4-Stroke Lean Burn Engines. NOx and CO emission factors based on <90% load during planned testing. Conservatively assume PM2.5 emission rates are equivalent to PM10 emission rates.

b - Hourly and 24-hour emissions based on 0.5 MMBtu/hr max input, testing engine for only 30 min/day, and annual emissions based on 100 hrs/yr.

Greenhouse Gas Emissions

Greenhouse Gas	Emission Factor[a] lb/MMBtu	Emission Rate[b] lb/hr	tpy
CO2	117	27	3
CH4	2.2E-03	5.1E-04	5.1E-05
N2O	2.2E-04	5.1E-05	5.1E-06
CO2e[c]		27	3

notes:

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

b - Hourly and 24-hour emissions based on 0.5 MMBtu/hr max input, testing engine for only 30 min/day, and annual emissions based on 100 hrs/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).

Toxic Air Pollutant Emissions

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	5.3E-06	1.1E-03
25551-13-7b	1,2,4-Trimethylbenzene	1.43E-05	3.3E-06	6.6E-04
25551-13-7	1,3,5-Trimethylbenzene	3.38E-05	7.8E-06	1.6E-03
106-99-0	1,3-Butadiene	2.67E-04	6.2E-05	1.2E-02
540-84-1	2,2,4-Trimethylpentane	2.50E-04	5.8E-05	1.2E-02
83-32-9	Acenaphthene [(b)]	7.03E-07	1.6E-07	3.3E-05
208-96-8	Acenaphthylene [(b)]	7.44E-06	1.7E-06	3.4E-04
75-07-0	Acetaldehyde [(b)]	3.91E-03	9.1E-04	1.8E-01
107-02-8	Acrolein [(b)]	1.60E-03	3.7E-04	7.4E-02
120-12-7	Anthracene [(b)]	2.51E-07	5.8E-08	1.2E-05
71-43-2	Benzene [(b)]	1.19E-03	2.7E-04	5.5E-02
192-97-2	Benzo(e)pyrene	4.15E-07	9.6E-08	1.9E-05
191-24-2	Benzo(g,h,i)perylene [(b)]	1.01E-07	2.3E-08	4.7E-06
92-52-4	Biphenyl	2.12E-04	4.9E-05	9.8E-03
287-92-3	Cyclopentane	2.27E-04	5.3E-05	1.1E-02
100-41-4	Ethylbenzene	3.97E-05	9.2E-06	1.8E-03
206-44-0	Fluoranthene [(b)]	2.45E-07	5.7E-08	1.1E-05
86-73-7	Fluorene [(b)]	4.51E-07	1.0E-07	2.1E-05
50-00-0	Formaldehyde [(b)]	2.81E-02	6.5E-03	1.3E+00
67-56-1	Methanol	2.50E-03	5.8E-04	1.2E-01
108-87-2	Methylcyclohexane	1.23E-03	2.8E-04	5.7E-02
75-09-2	Methylene Chloride	2.00E-05	4.6E-06	9.3E-04
110-54-3	n-Hexane	1.11E-03	2.6E-04	5.1E-02
111-84-2	n-Nonane	1.10E-04	2.5E-05	5.1E-03
111-65-9	n-Octane	3.51E-04	8.1E-05	1.6E-02
109-66-0	n-Pentane	2.60E-03	6.0E-04	1.2E-01
91-20-3	Naphthalene [(b)]	1.20E-04	2.8E-05	5.5E-03
108-95-2	Phenol	2.40E-05	5.6E-06	1.1E-03
85-01-8	Phenanthrene [(b)]	8.75E-07	2.0E-07	4.1E-05
129-00-0	Pyrene [(b)]	1.21E-07	2.8E-08	5.6E-06
79-34-5	Tetrachloroethane	2.48E-06	5.7E-07	1.1E-04
108-88-3	Toluene [(b)]	4.04E-04	9.4E-05	1.9E-02
75-01-4	Vinyl Chloride	1.49E-05	3.4E-06	6.9E-04
1330-20-7	Xylene [(b)]	1.33E-04	3.1E-05	6.2E-03
		Idaho PAH Group		
56-55-3	Benzo(a)anthracene [(b)]	7.63E-08	1.8E-08	3.5E-06
50-32-8	Benzo(a)pyrene [(b)]	3.48E-08	8.1E-09	1.6E-06
205-99-2	Benzo(b)fluoranthene [(b)]	3.21E-07	7.4E-08	1.5E-05
207-08-9	Benzo(k)fluoranthene [(b)]	5.20E-07	1.2E-07	2.4E-05
218-01-9	Chrysene [(b)]	9.45E-08	2.2E-08	4.4E-06
53-70-3	Dibenz(a,h)anthracene [(b)]	1.07E-08	2.5E-09	4.9E-07
193-39-5	Indeno(1,2,3-cd)pyrene [(b)]	1.18E-07	2.7E-08	5.4E-06
POM	PAH [(c)]	--	2.7E-07	1.4E-08

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 0.5 MMBtu/hr max input, testing engine for only 30 min/day, and annual emissions based on 100 hrs/yr.

J.R. Simplot Company - Caldwell Facility

EG2 - Natural Gas Generator

- 7kW Olympian G3OF3, Emergency Generator at Greenhouse

	Generator Specifications	
Operating hours	100 hours/year	
Firing rate	0.12 MMBtu/hr	Based on scaling EG1 to 7kW
Testing Limited to	30 min/day	
- Limit on specific hours to test	(12pm - 7pm)	

Criteria and PSD Pollutant Emissions

Pollutant	Emission Factor (lb/MMBtu)[a]	Potential to Emit [b]		
		lb/hr	lb/hr (24-hr ave)	TPY
NOx	0.85	0.05	--	0.005
CO	0.557	0.03	--	0.003
SO2	0.000588	3.5E-05	--	3.5E-06
PM-10	0.010	0.001	2.5E-05	6.0E-05
PM-2.5	0.010	0.001	2.5E-05	6.0E-05
VOC	0.12	0.01	--	7.1E-04

a - Emission factors from AP-42 Section 3.2 for 4-Stroke Lean Burn Engines. NOx and CO emission factors based on <90% load during planned testing. Conservatively assume PM2.5 emission rates are equivalent to PM10 emission rates.

b - Hourly and 24-hour emissions based on 0.1 MMBtu/hr max input, testing engine for only 30 min/day, and annual emissions based on 100 hrs/yr.

Greenhouse Gas Emissions

	Emission Factor [a]	Emission Rate [b]	
Greenhouse Gas	lb/MMBtu	lb/hr	tpy
CO2	117	7	1
CH4	2.2E-03	1.3E-04	1.3E-05
N2O	2.2E-04	1.3E-05	1.3E-06
CO2e [c]		7	1

notes:

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

b - Hourly and 24-hour emissions based on 0.1 MMBtu/hr max input, testing engine for only 30 min/day, and annual emissions based on 100 hrs/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).

Toxic Air Pollutant Emissions

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	1.4E-06	2.8E-04
25551-13-7b	1,2,4-Trimethylbenzene	1.43E-05	8.6E-07	1.7E-04
25551-13-7	1,3,5-Trimethylbenzene	3.38E-05	2.0E-06	4.1E-04
106-99-0	1,3-Butadiene	2.67E-04	1.6E-05	3.2E-03
540-84-1	2,2,4-Trimethylpentane	2.50E-04	1.5E-05	3.0E-03
83-32-9	Acenaphthene [b]	7.03E-07	4.2E-08	8.4E-06
208-96-8	Acenaphthylene [b]	7.44E-06	4.5E-07	8.9E-05
75-07-0	Acetaldehyde [b]	3.91E-03	2.3E-04	4.7E-02

107-02-8	Acrolein [(b)]	1.60E-03	9.6E-05	1.9E-02
120-12-7	Anthracene [(b)]	2.51E-07	1.5E-08	3.0E-06
71-43-2	Benzene [(b)]	1.19E-03	7.1E-05	1.4E-02
192-97-2	Benzo(e)pyrene	4.15E-07	2.5E-08	5.0E-06
191-24-2	Benzo(g,h,i)perylene [(b)]	1.01E-07	6.1E-09	1.2E-06
92-52-4	Biphenyl	2.12E-04	1.3E-05	2.5E-03
287-92-3	Cyclopentane	2.27E-04	1.4E-05	2.7E-03
100-41-4	Ethylbenzene	3.97E-05	2.4E-06	4.8E-04
206-44-0	Fluoranthene [(b)]	2.45E-07	1.5E-08	2.9E-06
86-73-7	Fluorene [(b)]	4.51E-07	2.7E-08	5.4E-06
50-00-0	Formaldehyde [(b)]	2.81E-02	1.7E-03	3.4E-01
67-56-1	Methanol	2.50E-03	1.5E-04	3.0E-02
108-87-2	Methylcyclohexane	1.23E-03	7.4E-05	1.5E-02
75-09-2	Methylene Chloride	2.00E-05	1.2E-06	2.4E-04
110-54-3	n-Hexane	1.11E-03	6.7E-05	1.3E-02
111-84-2	n-Nonane	1.10E-04	6.6E-06	1.3E-03
111-65-9	n-Octane	3.51E-04	2.1E-05	4.2E-03
109-66-0	n-Pentane	2.60E-03	1.6E-04	3.1E-02
91-20-3	Naphthalene [(b)]	1.20E-04	7.2E-06	1.4E-03
108-95-2	Phenol	2.40E-05	1.4E-06	2.9E-04
85-01-8	Phenanthrene [(b)]	8.75E-07	5.3E-08	1.1E-05
129-00-0	Pyrene [(b)]	1.21E-07	7.2E-09	1.4E-06
79-34-5	Tetrachloroethane	2.48E-06	1.5E-07	3.0E-05
108-88-3	Toluene [(b)]	4.04E-04	2.4E-05	4.8E-03
75-01-4	Vinyl Chloride	1.49E-05	8.9E-07	1.8E-04
1330-20-7	Xylene [(b)]	1.33E-04	8.0E-06	1.6E-03
	Idaho PAH Group			
56-55-3	Benzo(a)anthracene [(b)]	7.63E-08	4.6E-09	9.2E-07
50-32-8	Benzo(a)pyrene [(b)]	3.48E-08	2.1E-09	4.2E-07
205-99-2	Benzo(b)fluoranthene [(b)]	3.21E-07	1.9E-08	3.8E-06
207-08-9	Benzo(k)fluoranthene [(b)]	5.20E-07	3.1E-08	6.2E-06
218-01-9	Chrysene [(b)]	9.45E-08	5.7E-09	1.1E-06
53-70-3	Dibenz(a,h)anthracene [(b)]	1.07E-08	6.4E-10	1.3E-07
193-39-5	Indeno(1,2,3-cd)pyrene [(b)]	1.18E-07	7.1E-09	1.4E-06
POM	PAH [(c)]	--	7.0E-08	7.0E-06

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 0.1 MMBtu/hr max input, testing engine for only 30 min/day, and annual emissions based on 100 hrs/yr.

J.R. Simplot Company - Caldwell Facility

EG3 - Diesel Generator

- 100kW Onan #100DGDB, Emergency Generator at Wastewater

	Generator Specifications	
Operating hours	100 hours/year	
Firing rate	1.04 MMBtu/hr	Generator Spec. Sheet @ Full Load
Heat Value - No. 2 Distillate	0.138 MMBtu/gallon	40 CFR 98, Subpart C, Table C-1
Testing Limited to	30 min/day	
- Limit on specific hours to test	(12pm - 7pm)	

Criteria and PSD Pollutant Emissions

Pollutant	Emission Factor (lb/MMBtu)[(a)]	Potential to Emit [(b)]		
		lb/hr	lb/hr (24-hr ave)	TPY
NOx	4.41	2.28	--	0.23
CO	0.95	0.5	--	0.05
SO_2 [c]	1.52E-03	7.8E-04	--	7.8E-05
PM-10	0.31	0.16	0.0067	0.02
PM-2.5	0.31	0.16	0.0067	0.02
VOC	0.36	0.19	--	0.02

a - Emission factors from AP-42, Table 3.3-1, Emission Factors for Uncontrolled Gasoline and Diesel Industrial Engines, 10/96. Conservatively assume PM2.5 emission rates are equivalent to PM10 emission rates.

b - Hourly and 24-hr average emissions based on 1.0 MMBtu/hr max firing rate, 30 min testing/day and, and annual emissions based on 100 hrs/yr.

c - SOx emission factor based on ULSD (15 ppm S) and AP-42 Section 3.4, Large Stationary Diesel Engines, Table 3.4-1 (fuel input).

Greenhouse Gas Emissions

Greenhouse Gas	Emission Factor [a] lb/MMBtu	Emission Rate [b] lb/hr	tpy
CO_2	163	84	8
CH_4	6.6E-03	3.4E-03	3.4E-04
N_2O	1.3E-03	6.8E-04	6.8E-05
CO_2e [c]		85	8

notes:

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

b - Hourly and 24-hr average emissions based on 1.0 MMBtu/hr max firing rate, 30 min testing/day and, and annual emissions based on 100 hrs/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).

Toxic Air Pollutant Emissions

CAS#	Pollutant	Emission Factor (lb/MMBtu)[(a)]	PTE lb/hr [(c)]	PTE lb/yr [(c)]
106-99-0	1,3-Butadiene	3.91E-05	2.0E-05	4.0E-03
83-32-9	Acenaphthene	1.42E-06	7.3E-07	1.5E-04
208-96-8	Acenaphthylene	5.06E-06	2.6E-06	5.2E-04
75-07-0	Acetaldehyde	7.67E-04	4.0E-04	7.9E-02
107-02-8	Acrolein	9.25E-05	4.8E-05	9.6E-03
120-12-7	Anthracene	1.87E-06	9.7E-07	1.9E-04

71-43-2	Benzene	9.33E-04	4.8E-04	9.7E-02
191-24-2	Benzo(g,h,i)perylene	4.89E-07	2.5E-07	5.1E-05
206-44-0	Fluoranthene	7.61E-06	3.9E-06	7.9E-04
86-73-7	Fluorene	2.92E-05	1.5E-05	3.0E-03
50-00-0	Formaldehyde	1.18E-03	6.1E-04	1.2E-01
91-20-3	Naphthalene	8.48E-05	4.4E-05	8.8E-03
85-01-8	Phenanthrene	2.94E-05	1.5E-05	3.0E-03
129-00-0	Pyrene	4.78E-06	2.5E-06	4.9E-04
108-88-3	Toluene	4.09E-04	2.1E-04	4.2E-02
1330-20-7	Xylene	2.85E-04	1.5E-04	2.9E-02
	Idaho PAH Group			
56-55-3	Benzo(a)anthracene	1.68E-06	8.7E-07	1.7E-04
50-32-8	Benzo(a)pyrene	1.88E-07	9.7E-08	1.9E-05
205-99-2	Benzo(b)fluoranthene	9.91E-08	5.1E-08	1.0E-05
207-08-9	Benzo(k)fluoranthene	1.55E-07	8.0E-08	1.6E-05
218-01-9	Chrysene	3.53E-07	1.8E-07	3.7E-05
53-70-3	Dibenz(a,h)anthracene	5.83E-07	3.0E-07	6.0E-05
193-39-5	Indeno(1,2,3-cd)pyrene	3.75E-07	1.9E-07	3.9E-05
POM	PAH [(b)]	--	1.8E-06	1.8E-04

Notes:

a - Emission factors from AP-42, Table 3.3-2, Speciated Organic Compoun Emission Factors for Uncontrolled Diesel Engine, Emission Factor Rating E, 10/96

b - 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.

c - Hourly and 24-hr average emissions based on 1.0 MMBtu/hr max firing rate, 30 min testing/day and, and annual emissions based on 100 hrs/yr.

J.R. Simplot Company - Caldwell Facility

EG4 - Natural Gas Generator

- 7kW Dayton 3W057, Emergency Generator at Tech Center

	Generator Specifications	
Operating hours	100 hours/year	
Firing rate	0.12 MMBtu/hr	Based on scaling EG1 to 7kW
Testing Limited to	30 min/day	
- Limit on specific hours to test	(12pm - 7pm)	

Criteria and PSD Pollutant Emissions

Pollutant	Emission Factor (lb/MMBtu)[a]	Potential to Emit [b]		
		lb/hr	lb/hr (24-hr ave)	TPY
NOx	1.94	0.12	--	0.012
CO	0.557	0.03	--	0.003
SO2	0.000588	3.5E-05	--	3.5E-06
PM-10	0.048	0.003	1.2E-04	2.9E-04
PM-2.5	0.048	0.003	1.2E-04	2.9E-04
VOC	0.12	0.01	--	7.2E-04

a - Emission factors from AP-42 Section 3.2 (maximum of 2-Stroke and 4-Stroke Engines). NOx and CO emission factors based on <90% load during planned testing. Conservatively assume PM2.5 emission rates are equivalent to PM10 emission rates.

b - Hourly and 24-hour emissions based on 0.1 MMBtu/hr max input, testing engine for only 30 min/day, and annual emissions based on 100 hrs/yr.

Greenhouse Gas Emissions

Greenhouse Gas	Emission Factor [a] lb/MMBtu	Emission Rate [b] lb/hr	tpy
CO2	117	7	1
CH4	2.2E-03	1.3E-04	1.3E-05
N2O	2.2E-04	1.3E-05	1.3E-06
CO2e [c]		7	1

notes:

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

b - Hourly and 24-hour emissions based on 0.1 MMBtu/hr max input, testing engine for only 30 min/day, and annual emissions based on 100 hrs/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).

Toxic Air Pollutant Emissions

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	1.4E-06	2.8E-04
25551-13-7b	1,2,4-Trimethylbenzene	1.43E-05	8.6E-07	1.7E-04
25551-13-7	1,3,5-Trimethylbenzene	3.38E-05	2.0E-06	4.1E-04
106-99-0	1,3-Butadiene	2.67E-04	1.6E-05	3.2E-03
540-84-1	2,2,4-Trimethylpentane	2.50E-04	1.5E-05	3.0E-03
83-32-9	Acenaphthene [b]	7.03E-07	4.2E-08	8.4E-06
208-96-8	Acenaphthylene [b]	7.44E-06	4.5E-07	8.9E-05
75-07-0	Acetaldehyde [b]	3.91E-03	2.3E-04	4.7E-02

107-02-8	Acrolein [b]	1.60E-03	9.6E-05	1.9E-02
120-12-7	Anthracene [b]	2.51E-07	1.5E-08	3.0E-06
71-43-2	Benzene [b]	1.19E-03	7.1E-05	1.4E-02
192-97-2	Benzo(e)pyrene	4.15E-07	2.5E-08	5.0E-06
191-24-2	Benzo(g,h,i)perylene [b]	1.01E-07	6.1E-09	1.2E-06
92-52-4	Biphenyl	2.12E-04	1.3E-05	2.5E-03
287-92-3	Cyclopentane	2.27E-04	1.4E-05	2.7E-03
100-41-4	Ethylbenzene	3.97E-05	2.4E-06	4.8E-04
206-44-0	Fluoranthene [b]	2.45E-07	1.5E-08	2.9E-06
86-73-7	Fluorene [b]	4.51E-07	2.7E-08	5.4E-06
50-00-0	Formaldehyde [b]	2.81E-02	1.7E-03	3.4E-01
67-56-1	Methanol	2.50E-03	1.5E-04	3.0E-02
108-87-2	Methylcyclohexane	1.23E-03	7.4E-05	1.5E-02
75-09-2	Methylene Chloride	2.00E-05	1.2E-06	2.4E-04
110-54-3	n-Hexane	1.11E-03	6.7E-05	1.3E-02
111-84-2	n-Nonane	1.10E-04	6.6E-06	1.3E-03
111-65-9	n-Octane	3.51E-04	2.1E-05	4.2E-03
109-66-0	n-Pentane	2.60E-03	1.6E-04	3.1E-02
91-20-3	Naphthalene [b]	1.20E-04	7.2E-06	1.4E-03
108-95-2	Phenol	2.40E-05	1.4E-06	2.9E-04
85-01-8	Phenanthrene [b]	8.75E-07	5.3E-08	1.1E-05
129-00-0	Pyrene [b]	1.21E-07	7.2E-09	1.4E-06
79-34-5	Tetrachloroethane	2.48E-06	1.5E-07	3.0E-05
108-88-3	Toluene [b]	4.04E-04	2.4E-05	4.8E-03
75-01-4	Vinyl Chloride	1.49E-05	8.9E-07	1.8E-04
1330-20-7	Xylene [b]	1.33E-04	8.0E-06	1.6E-03
	Idaho PAH Group			
56-55-3	Benzo(a)anthracene [b]	7.63E-08	4.6E-09	9.2E-07
50-32-8	Benzo(a)pyrene [b]	3.48E-08	2.1E-09	4.2E-07
205-99-2	Benzo(b)fluoranthene [b]	3.21E-07	1.9E-08	3.8E-06
207-08-9	Benzo(k)fluoranthene [b]	5.20E-07	3.1E-08	6.2E-06
218-01-9	Chrysene [b]	9.45E-08	5.7E-09	1.1E-06
53-70-3	Dibenz(a,h)anthracene [b]	1.07E-08	6.4E-10	1.3E-07
193-39-5	Indeno(1,2,3-cd)pyrene [b]	1.18E-07	7.1E-09	1.4E-06
POM	PAH [c]	--	7.0E-08	3.5E-09

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 0.1 MMBtu/hr max input, testing engine for only 30 min/day, and annual emissions based on 100 hrs/yr.

J.R. Simplot Company - Caldwell Facility

EG5 - Natural Gas Fired Generator

	Generator Specifications
PTE Operating hours	100 hours/year
Natural Gas Firing rate [e]	1.80 MMBtu/hr
Engine Size	195 kW
Actual Testing Hours	30 min/day

Note: PSI 8.8LTCAC

Criteria and PSD Pollutant Emissions

Pollutant	Emission Factor (lb/MMBtu)[a]	Potential to Emit [b]		
		lb/hr	lb/hr (24-hr ave)	TPY
NOx [f]	2.7 g/kW-hr	0.58	--	0.06
CO [f]	4.4 g/kW-hr	0.95	--	0.09
SO2	5.88E-04	5.3E-04	--	5.3E-05
PM-10	9.50E-03	0.009	3.6E-04	8.6E-04
PM-2.5	9.50E-03	0.009	3.6E-04	8.6E-04
VOC [f]	2.7 g/kW-hr	0.58	--	0.06

a - Emission factors from AP-42, Table 3.2-3, Emission Factors for Natural Gas-fired Reciprocating Engines

b - Hourly and 24-hr average emissions based on 1.8 MMBtu/hr max firing rate, 30 min testing/day and, and annual emissions based on 500 hrs/yr.

c - SOx emission factor based on AP-42, Table 3.2-3

d- Flow rates taken from Standard Caterpillar 1250 KW cut sheet

e - Firing rate from CAT quote sheet

f - NO_X + HC, and CO, emissions based on EPA emission standards, in g/kW-hr. (40 CFR 1048.101)

Greenhouse Gas Emissions

Greenhouse Gas	Emission Factor [a] lb/MMBtu	Emission Rate [b] lb/hr	tpy
CO2	1.17E+02	--	11
CH4	2.2E-03	--	2.0E-04
N2O	2.2E-04	--	2.0E-05
CO2e [c]			11

notes:

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

b - Hourly and 24-hour emissions based on 1.8 MMBtu/hr max input, testing engine for only 30 min/day, and annual emissions based on 100 hrs/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).

Toxic Air Pollutant Emissions

CAS#	Pollutant	Emission Factor (lb/MMBtu)[a]	PTE lb/hr [d]	PTE lb/yr [d]
79-34-5	1,1,2,2-Tetrachloroethane	2.35E-05	4.2E-05	4.2E-03
79-00-5	1,1,2-Trichloroethane	1.13E-05	2.0E-05	2.0E-03
107-06-2	1,2-Dichloroethane	1.13E-05	2.0E-05	2.0E-03
78-87-5	1,2-Dichloropropane	1.30E-05	2.3E-05	2.3E-03
106-99-0	1,3-Butadiene	6.63E-04	1.2E-03	1.2E-01
542-75-6	1,3-Dichloropropene	1.27E-05	2.3E-05	2.3E-03
83-32-9	Acenaphthene		0.0E+00	0.0E+00
208-96-8	Acenaphthylene		0.0E+00	0.0E+00
75-07-0	Acetaldehyde	2.79E-03	5.0E-03	5.0E-01
107-02-8	Acrolein	2.63E-03	4.7E-03	4.7E-01
120-12-7	Anthracene		0.0E+00	0.0E+00
71-43-2	Benzene	1.58E-03	2.8E-03	2.8E-01
191-24-2	Benzo(g,h,i)perylene		0.0E+00	0.0E+00
56-23-5	Carbon Tetrachloride	1.77E-05	3.2E-05	3.2E-03

108-90-7	Chlorobenzene	1.29E-03	2.3E-03	2.3E-01
67-66-3	Chloroform	1.37E-05	2.5E-05	2.5E-03
100-41-4	Ethylbenzene	2.48E-05	4.5E-05	4.5E-03
106-93-4	Ethylene Dibromide	2.13E-05	3.8E-05	3.8E-03
206-44-0	Fluoranthene		0.0E+00	0.0E+00
86-73-7	Fluorene		0.0E+00	0.0E+00
50-00-0	Formaldehyde	2.05E-02	3.7E-02	3.7E+00
67-56-1	Methanol	3.06E-03	5.5E-03	5.5E-01
91-20-3	Naphthalene	9.71E-05	1.7E-04	1.7E-02
85-01-8	Phenanthrene		0.0E+00	0.0E+00
129-00-0	Pyrene		0.0E+00	0.0E+00
100-42-5	Styrene	1.19E-05	2.1E-05	2.1E-03
108-88-3	Toluene	5.58E-04	1.0E-03	1.0E-01
75-01-4	Vinyl Chloride	7.18E-06	1.3E-05	1.3E-03
1330-20-7	Xylene	1.95E-04	3.5E-04	3.5E-02
	Idaho PAH Group			
56-55-3	Benzo(a)anthracene [b]			
50-32-8	Benzo(a)pyrene [b]			
205-99-2	Benzo(b)fluoranthene [b]			
207-08-9	Benzo(k)fluoranthene [b]			
218-01-9	Chrysene [b]			
53-70-3	Dibenz(a,h)anthracene [b]			
193-39-5	Indeno(1,2,3-cd)pyrene [b]			
POM	PAH [c]	1.41E-04	2.5E-04	2.5E-02

Notes:

a - Emission factors from AP-42, Table 3.3-2, Speciated Organic Compound Emission Factors for Uncontrolled Diesel Engine, Emission Factor Rating E, 10/96

b - 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.

c - Hourly and 24-hr average emissions based on 1.8 MMBtu/hr max firing rate, 30 min testing/day and, and annual emissions based on 100 hrs/yr.

J.R. Simplot Company - Caldwell Facility

EG 6 - Diesel Fired Server Room Generator

- 180 hp Kohler 115ROZK 4-Cycle Diesel Generator

	Generator Specifications	
Operating hours	100 hours/year	
Firing rate	1.24 MMBtu/hr	Generator Spec. Sheet @ Full Load (G
Heat Value - No. 2 Distillate	0.138 MMBtu/gallon	40 CFR 98, Subpart C, Table C-1
Testing Limited to	30 min/day	
- Limit on specific hours to test	(12pm - 7pm)	

Criteria and PSD Pollutant Emissions

Pollutant	Emission Factor (lb/MMBtu)[(a)]	Potential to Emit [(b)]		
		lb/hr	lb/hr (24-hr ave)	TPY
NOx	4.41	2.7	--	0.27
CO	0.95	0.6	--	0.06
SO2 [c]	1.52E-03	9.4E-04	--	9.4E-05
PM-10	0.31	0.193	0.0080	1.9E-02
PM-2.5	0.31	0.193	0.0080	1.9E-02
VOC	0.36	0.22	--	2.2E-02

a - Emission factors from AP-42, Table 3.3-1, Emission Factors for Uncontrolled Gasoline and Diesel Industrial Engines, 10/96. Conservatively assume PM2.5 emission rates are equivalent to PM10 emission rates.

b - Hourly and 24-hr average emissions based on 1.2 MMBtu/hr max firing rate, 30 min testing/day and, and annual emissions based on 100 hrs/yr.

c - SOx emission factor based on ULSD (15 ppm S) and AP-42 Section 3.4, Large Stationary Diesel Engines, Table 3.4-1 (fuel input).

Greenhouse Gas Emissions

Greenhouse Gas	Emission Factor [a] lb/MMBtu	Emission Rate [b] lb/hr	tpy
CO2	163	101	10
CH4	6.6E-03	4.1E-03	4.1E-04
N2O	1.3E-03	8.2E-04	8.2E-05
CO2e [c]		102	10

notes:

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

b - Hourly and 24-hr average emissions based on 1.2 MMBtu/hr max firing rate, 30 min testing/day and, and annual emissions based on 100 hrs/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).

Toxic Air Pollutant Emissions

CAS#	Pollutant	Emission Factor (lb/MMBtu)[(a)]	PTE lb/hr [(c)]	PTE lb/yr [(c)]
106-99-0	1,3-Butadiene	3.91E-05	2.4E-05	4.9E-03
83-32-9	Acenaphthene	1.42E-06	8.8E-07	1.8E-04
208-96-8	Acenaphthylene	5.06E-06	3.1E-06	6.3E-04
75-07-0	Acetaldehyde	7.67E-04	4.8E-04	9.5E-02
107-02-8	Acrolein	9.25E-05	5.7E-05	1.1E-02

120-12-7	Anthracene	1.87E-06	1.2E-06	2.3E-04
71-43-2	Benzene	9.33E-04	5.8E-04	1.2E-01
191-24-2	Benzo(g,h,i)perylene	4.89E-07	3.0E-07	6.1E-05
206-44-0	Fluoranthene	7.61E-06	4.7E-06	9.5E-04
86-73-7	Fluorene	2.92E-05	1.8E-05	3.6E-03
50-00-0	Formaldehyde	1.18E-03	7.3E-04	1.5E-01
91-20-3	Naphthalene	8.48E-05	5.3E-05	1.1E-02
85-01-8	Phenanthrene	2.94E-05	1.8E-05	3.7E-03
129-00-0	Pyrene	4.78E-06	3.0E-06	5.9E-04
108-88-3	Toluene	4.09E-04	2.5E-04	5.1E-02
1330-20-7	Xylene	2.85E-04	1.8E-04	3.5E-02
	Idaho PAH Group			
56-55-3	Benzo(a)anthracene	1.68E-06	1.0E-06	2.1E-04
50-32-8	Benzo(a)pyrene	1.88E-07	1.2E-07	2.3E-05
205-99-2	Benzo(b)fluoranthene	9.91E-08	6.2E-08	1.2E-05
207-08-9	Benzo(k)fluoranthene	1.55E-07	9.6E-08	1.9E-05
218-01-9	Chrysene	3.53E-07	2.2E-07	4.4E-05
53-70-3	Dibenz(a,h)anthracene	5.83E-07	3.6E-07	7.2E-05
193-39-5	Indeno(1,2,3-cd)pyrene	3.75E-07	2.3E-07	4.7E-05
POM	PAH [(b)]	--	2.1E-06	2.1E-04

Notes:

a - Emission factors from AP-42, Table 3.3-2, Speciated Organic Compoun Emission Factors for Uncontrolled Diesel Engine, Emission Factor Rating E, 10/96

b - 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.

c - Hourly and 24-hr average emissions based on 1.2 MMBtu/hr max firing rate, 30 min testing/day and, and annual emissions based on 100 hrs/yr.

J.R. Simplot Company - Caldwell Facility

FWP1 - Diesel Fire Water Pump

- 300 hp Cummins NT855F3, fire water pump

	Generator Specifications	
Operating hours	100 hours/year	
Firing rate	2.22 MMBtu/hr	Generator Spec. Sheet @ Full Load
Heat Value - No. 2 Distillate	0.138 MMBtu/gallon	40 CFR 98, Subpart C, Table C-1
Testing Limited to	30 min/day	
- Limit on specific hours to test	(12pm - 7pm)	

Criteria and PSD Pollutant Emissions

Pollutant	Emission Factor (lb/MMBtu)[(a)]	Potential to Emit [(b)] lb/hr	lb/hr (24-hr ave)	TPY
NOx	4.41	4.9	--	0.49
CO	0.95	1.1	--	0.11
SO2 [c]	1.52E-03	1.7E-03	--	1.7E-04
PM-10	0.31	0.344	0.0143	3.4E-02
PM-2.5	0.31	0.344	0.0143	3.4E-02
VOC	0.36	0.40	--	4.0E-02

a - Emission factors from AP-42, Table 3.3-1, Emission Factors for Uncontrolled Gasoline and Diesel Industrial Engines, 10/96. Conservatively assume PM2.5 emission rates are equivalent to PM10 emission rates.

b - Hourly and 24-hr average emissions based on 2.2 MMBtu/hr max firing rate, 30 min testing/day and, and annual emissions based on 100 hrs/yr.

c - SOx emission factor based on ULSD (15 ppm S) and AP-42 Section 3.4, Large Stationary Diesel Engines, Table 3.4-1 (fuel input).

Greenhouse Gas Emissions

Greenhouse Gas	Emission Factor [a] lb/MMBtu	Emission Rate [b] lb/hr	tpy
CO2	163	181	18
CH4	6.6E-03	7.3E-03	7.3E-04
N2O	1.3E-03	1.5E-03	1.5E-04
CO2e [c]		182	18

notes:

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

b - Hourly and 24-hr average emissions based on 2.2 MMBtu/hr max firing rate, 30 min testing/day and, and annual emissions based on 100 hrs/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).

Toxic Air Pollutant Emissions

CAS#	Pollutant	Emission Factor (lb/MMBtu)[(a)]	PTE lb/hr [(c)]	PTE lb/yr [(c)]
106-99-0	1,3-Butadiene	3.91E-05	4.3E-05	8.7E-03
83-32-9	Acenaphthene	1.42E-06	1.6E-06	3.2E-04
208-96-8	Acenaphthylene	5.06E-06	5.6E-06	1.1E-03
75-07-0	Acetaldehyde	7.67E-04	8.5E-04	1.7E-01
107-02-8	Acrolein	9.25E-05	1.0E-04	2.1E-02

120-12-7	Anthracene	1.87E-06	2.1E-06	4.2E-04
71-43-2	Benzene	9.33E-04	1.0E-03	2.1E-01
191-24-2	Benzo(g,h,i)perylene	4.89E-07	5.4E-07	1.1E-04
206-44-0	Fluoranthene	7.61E-06	8.5E-06	1.7E-03
86-73-7	Fluorene	2.92E-05	3.2E-05	6.5E-03
50-00-0	Formaldehyde	1.18E-03	1.3E-03	2.6E-01
91-20-3	Naphthalene	8.48E-05	9.4E-05	1.9E-02
85-01-8	Phenanthrene	2.94E-05	3.3E-05	6.5E-03
129-00-0	Pyrene	4.78E-06	5.3E-06	1.1E-03
108-88-3	Toluene	4.09E-04	4.5E-04	9.1E-02
1330-20-7	Xylene	2.85E-04	3.2E-04	6.3E-02
	Idaho PAH Group			
56-55-3	Benzo(a)anthracene	1.68E-06	1.9E-06	3.7E-04
50-32-8	Benzo(a)pyrene	1.88E-07	2.1E-07	4.2E-05
205-99-2	Benzo(b)fluoranthene	9.91E-08	1.1E-07	2.2E-05
207-08-9	Benzo(k)fluoranthene	1.55E-07	1.7E-07	3.4E-05
218-01-9	Chrysene	3.53E-07	3.9E-07	7.8E-05
53-70-3	Dibenz(a,h)anthracene	5.83E-07	6.5E-07	1.3E-04
193-39-5	Indeno(1,2,3-cd)pyrene	3.75E-07	4.2E-07	8.3E-05
POM	PAH [(b)]	--	3.8E-06	3.8E-04

Notes:

a - Emission factors from AP-42, Table 3.3-2, Speciated Organic Compoun Emission Factors for Uncontrolled Diesel Engine, Emission Factor Rating E, 10/96

b - 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.

c - Hourly and 24-hr average emissions based on 2.2 MMBtu/hr max firing rate, 30 min testing/day and, and annual emissions based on 100 hrs/yr.

Sulfur Dioxide Calculations - Maximum Day Emissions

Basis:	31,740	scf/hr	Biogas (based on maximum blower throughput of 500 scfm with 29 scfm safety factor)
	19,044	scf/hr	Methane @ 60% methane (PTC analysis)
	5391	ppmv	Hydrogen Sulfide in Biogas (Digester Permit Limit)

Calculation: at 5391 ppmv H2S in Biogas = 0.005391 volume fraction of total Biogas

171.11034 scf H2S/hr

(31,740 scf/hr) x (0.005391) = 171 scf H2S/hr

PV = nRT

1	P = pressure, atmospheres
171.11034	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.

$$n = \frac{PV}{RT} = \frac{(1\ \text{atm})\ (171.1\ \text{scf H2S/hr})}{(0.7302\ \text{atm-cf/lbmoles-deg. R})\ (460+60\ \text{deg. R})}$$

= 0.4506414 lbmoles H2S/hr

	H_2S	+	$1½O_2$	g	SO_2	+	H_2O
MW	34				64		
lbmoles/hr	0.45				0.45		
lbs/hr	15.32				28.84		

Emission Factor for sulfur dioxide

$$\frac{(28.8\ \text{lbs SO2/hr})*(0.6\ \text{scf CH4})*(1{,}000{,}000\ \text{scf})}{(19{,}044\ \text{scf CH4/hr})*(1\ \text{scf biogas})*(1\ \text{MMscf})} = 908.7\ \text{lbs SO2/MM scf Biogas}$$

18.2 lbs SO2/MM scf Biogas (controlled, 98% sulfur removal)

Sulfur Dioxide Calculations - Average Day/Annual Emissions

Basis:	23,771,141	lb COD reduced/yr	Biogas PTC Application (1999)
	542,720	scf biogas/day	Biogas (based on COD reduction, 5.0 cf methane/lb COD reduced) - average annual flow rate from 1997 flare PTC Application
	325,632	scf CH4/day	Methane @ 60% methane (PTC analysis)
	5	cf CH4/lb COD reduc	PTC analysis
Digester and Flare Permit Limits:	2000000	lb COD/month	
	90	tons SO2/year	
	5391	ppmv	Hydrogen Sulfide in Biogas (Digester Permit Limit)

Calculation:

at 5391 ppmv H2S in Biogas = 0.005391 volume fraction of total Biogas
(542,720 scf/day) x (0.005391) = 2,926 scf H2S/day
2926 scf H2S/day

PV = nRT
1 P = pressure, atmospheres
2925.8 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.

$$n = \frac{PV}{RT} = \frac{\text{(1 atm) (2,925.8 scf H2S/day)}}{\text{(0.7302 atm-cf/lbmoles-deg. R) (460+60 deg. R)}}$$

= 7.71 lbmoles H2S/day

	H_2S	+	$1½O_2$	g	SO_2	+	H_2O
MW	34				64		
lbmoles/d	7.7				7.7		
lbs/day	262.0				493.2		

493.2 lbs/day x 365 days = 180,000 lbs/yr SO_2

= 90.0 tons/yr SO_2

Emission Factor for sulfur dioxide

$$\frac{\text{(493.2 lbs SO2/d)*(0.6 scf CH4)*(1,000,000 scf)}}{\text{(325,632 scf CH4/d)*(1 scf biogas)*(1 MMscf)}} = 908.7 \text{ lbs SO2/MM scf Biogas}$$

Greenhouse Gas Calculations - Anaerobic Digester Biogas

Basis:	24,000,000	lb COD reduced/yr	Biogas PTC Application (1999)
	200,000,000	scf biogas/yr	Biogas (based on COD reduction, 5.0 cf methane/lb COD reduced) - average annual flow rate from 1997 flare PTC Application
	120,000,000	scf CH4/yr	Methane @ 60% methane (PTC analysis)
	5	cf CH4/lb COD reduced	PTC analysis
	0.6	fraction CH4 in biogas	PTC analysis

Digester Limit: 2,000,000 lb COD/month

Compound	Moles of Carbon	% Volume [a]	% Volume [b]	Volume (scf/yr)	lb-mol/yr	lb-mol C/yr
H2	0	< 1.0	< 1.4	2,762,348	7,275	0
O2	0	5.5	--	--	--	--
N2	0	22.5	--	--	--	--
H2O	=	3.1	4.3			
CO	1	< 0.1	< 0.1	276,235	728	728
CO2	1	17.0	23.5	46,959,912	123,675	123,675
CH4	1	51.2	70.7	141,432,205	372,480	372,480
TNMOC as CH4	1	0.00218	0.00301	6,022	16	16
					Total lb-mol C/yr =	**496,899**

Notes:

a - Biogas Composition from testing conducted 9/20/2011.

b - Assume leak in digester cover caused N2 and O2 portions of bioags composition, recalculate other compoents by removing N2 and O2 and scale up to 100% of the volume.

Calculation: CO2 EF = 119,256 lb CO2/MMscf Biogas

PV = nRT
n = PV/RT

1 P = pressure, atmospheres
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.

APPENDIX B – AMBIENT AIR QUALITY IMPACT ANALYSES

M E M O R A N D U M

DATE: September 16, 2021

TO: Zach Pierce, Permit Writer, Air Program

FROM: Pao Baylon, Modeling Review Analyst, Air Program

PROJECT: P-2011.0141 PROJ 62651, Permit Modification to Install a New Conventional Fry Line at a Potato Processing Plant in Caldwell, Idaho.

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

Contents

Acronyms, Units, and Chemical Nomenclature

AAC	Acceptable Ambient Concentration of a Non-carcinogenic TAP
AACC	Acceptable Ambient Concentration of a Carcinogenic TAP
AERMAP	The terrain data preprocessor for AERMOD
AERMET	The meteorological data preprocessor for AERMOD
AERMOD	American Meteorological Society/Environmental Protection Agency Regulatory Model
Appendix W	40 CFR 51, Appendix W – Guideline on Air Quality Models
ASOS	Automated Surface Observing System
BPIP	Building Profile Input Program
BRC	Below Regulatory Concern
Btu	British thermal units
CFR	Code of Federal Regulations
CMAQ	Community Multi-Scale Air Quality Modeling System
CO	Carbon Monoxide
D	Effective stack diameter of flare
DEQ	Idaho Department of Environmental Quality
EL	Emissions Screening Level of a TAP
EPA	United States Environmental Protection Agency
GEP	Good Engineering Practice
H_a	Actual height of flare
H_e	Effective stack height of flare
HHV	Higher Heating Value
hr	Hours
IC	Internal Combustion
Idaho Air Rules	Rules for the Control of Air Pollution in Idaho, located in the Idaho Administrative Procedures Act 58.01.01
ISCST3	Industrial Source Complex Short Term 3 dispersion model
K	Kelvin
lb/hr	Pounds per hour
m	Meters
m/sec	Meters per second
MMBtu/hr	Million British thermal units per hour
NAAQS	National Ambient Air Quality Standards
NED	National Elevation Dataset
NESHAP	National Emission Standard for Hazardous Air Pollutants
NO	Nitrogen Oxide
NO_2	Nitrogen Dioxide
NOx	Oxides of Nitrogen
NSPS	New Source Performance Standards
NW AIRQUEST	Northwest International Air Quality Environmental Science and Technology Consortium
O_3	Ozone
Pb	Lead

PM_{10}	Particulate matter with an aerodynamic particle diameter less than or equal to a nominal 10 micrometers
$PM_{2.5}$	Particulate matter with an aerodynamic particle diameter less than or equal to a nominal 2.5 micrometers
ppb	Parts per billion
PRIME	Plume Rise Model Enhancement
PSD	Prevention of Significant Deterioration
PTC	Permit to Construct
PTE	Potential to Emit
q	Gross heat released from flare
q_n	Net heat released from flare
Ramboll	Ramboll Group (permittee's permitting and modeling consultant)
RTO	Regenerative Thermal Oxidizer
SER	Significant Emission Rate
SIL	Significant Impact Level
Simplot	J.R. Simplot Company (permittee)
SO_2	Sulfur Dioxide
TAP	Toxic Air Pollutant
tpy	Tons per year
USGS	United States Geological Survey
UTM	Universal Transverse Mercator
VOC	Volatile Organic Compounds
º	Degrees Latitude or Longitude
ºF	Degrees Fahrenheit
$\mu g/m^3$	Micrograms per cubic meter of air

1.0 Summary

J.R. Simplot Company (Simplot) submitted a Permit to Construct (PTC) application in support of a modification to its potato processing plant in Caldwell, Idaho. The facility currently operates under an Idaho Department of Environmental Quality (DEQ) PTC No. P-2011.0141 issued on November 5, 2015. Simplot proposes to expand facility production by installing a new conventional fry line ("Line 5"), including: natural gas-heated dryer, steam-heated fryer, and other non-emitting equipment. The exhaust from Line 5 fryer will be controlled by the existing regenerative thermal oxidizer (RTO), and exhaust from the Line 5 dryer will be routed to the atmosphere through four dryer vents. In addition to adding Line 5, Simplot also proposes two additional changes at the facility:

- Venting the existing mainline dryers (Line 1 and Line 4) directly to the atmosphere instead of through the RTO.
- Requesting an annual mainline (Line 1, Line 4, and Line 5) throughput limit of 532,000 tons of finished product per year. The proposed throughput limit will ensure the facility-wide VOC emissions will remain below Title V permitting thresholds.

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

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

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

The submitted information and analyses: 1) utilized appropriate methods and models; 2) was conducted using reasonably accurate or conservative model parameters and input data (review of emission estimates was addressed by the DEQ permit writer); 3) adhered to established DEQ guidelines for new source review dispersion modeling; 4) showed either a) that estimated potential/allowable emissions are at a level defined as below regulatory concern (BRC) and do not require a NAAQS compliance demonstration; b) that predicted pollutant concentrations from emissions associated with the project as modeled were below Significant Impact Levels (SILs) or other applicable regulatory thresholds; or c) that predicted pollutant concentrations from emissions associated with the project, when appropriately

combined with co-contributing sources and background concentrations, were below applicable NAAQS at ambient air locations where and when the project has a significant impact; 5) showed that TAP emission increases associated with the project will not result in increased ambient air impacts exceeding allowable TAP increments. This conclusion assumes that conditions in Table 1 are representative of facility design capacity or operations as limited by a federally enforceable permit condition. The DEQ permit writer should use Table 1 and other information presented in this memorandum to generate appropriate permit provisions/restrictions to assure emissions do not exceed applicable regulatory thresholds requiring further analyses and to assure the requirements of Appendix W are met regarding emissions representative of design capacity or permit allowable rates.

Table 1. KEY ASSUMPTIONS USED IN MODELING ANALYSES.

Criteria/Assumption/Result	Explanation/Consideration
General Emission Rates. Emission rates used in the air impact analyses must represent maximum potential emissions as given by design capacity, inherently limited by the nature of the process or configuration of the facility, or as limited by the issued permit for the specific pollutant and averaging period.	Compliance has not been demonstrated for emission rates greater than those used in the air impact analyses.
Air Impact Analyses for Criteria Pollutant Emissions. Short-term and long-term emissions of $PM_{2.5}$ and PM_{10} from affected units and processes exceed $1/8^{th}$ of the Significant Emission Rates (SER). Therefore, emissions must be modeled to satisfy NAAQS Compliance Demonstration requirements.	Project-specific air impact analyses demonstrating compliance with NAAQS, as required by Idaho Air Rules Section 203.02, are required for post-project facility-wide emissions above Below Regulatory Concern (BRC) thresholds. Site-specific impact modeling is required for pollutants having an emission increase that is greater than Significant Impact Level (SIL) modeling applicability thresholds (for facilities that have not previously performed facility-wide NAAQS compliance modeling) or $1/8^{th}$ of the SER (for facilities that have previously performed facility-wide NAAQS compliance modeling), where the BRC exclusion cannot be used.
Air Impact Analyses for TAP Emissions. Allowable emissions of arsenic, cadmium, chromium (VI), and formaldehyde exceed screening emission levels (ELs). Analyses demonstrating compliance with arsenic, cadmium, chromium (VI), and formaldehyde TAP increments were performed.	A TAP increment compliance demonstration, as required by Idaho Air Rules Section 203.03, would be required for any TAPs with emission increases above ELs.
Testing and Maintenance of Emergency Internal Combustion Engines. Seven emergency engines will provide electrical backup power and firewater to the Simplot Caldwell facility. For testing and maintenance purposes, the emergency generators will be limited to 100 hours per year and may operate up to 30 minutes per day. Testing and maintenance operation of emergency engines is subject to modeling requirements except for 1-hour NO_2 SIL and NAAQS. True operation of the emergency generator, during an actual emergency, is not subject to modeling requirements.	Limited daily and annual operation assumptions for the emergency generator were applied to the cumulative NAAQS impact analyses. Only $PM_{2.5}$ and PM_{10} were modeled in this permitting project. Particulate emissions from all seven emergency engines are very minimal.
Release Parameters for Emission Points. Stack heights are no shorter than what is indicated in this memorandum. Stack diameters are no larger than what is indicated in this memorandum. Typical exhaust flow rates and temperatures at the point of release are not less than the values indicated in this memorandum.	Compliance with applicable air quality standards is not assured if release parameters vary substantially from what was used in impact analyses.

Summary of Submittals and Actions

June 18, 2021 Application received by DEQ.

June 24, 2021 Regulatory start date.

July 22, 2021 Application determined complete by DEQ.

2.0 Background Information

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

2.1 Project Description

Simplot produces par-fried French fries, including both battered and unbattered products, par-fried preformed potato products, and shredded potatoes. Trucks transport raw potatoes to the plant, where the potatoes are unloaded inside the enclosed receiving area within the processing building. The potatoes are mechanically sorted by size and, during harvest season, randomly inspected by the Idaho Department of Agriculture.

After sorting and inspection, the potatoes are transported to one of the facility's five production lines. Steam peelers remove the potato peels for most product cuts prior to being sliced into various shapes and lengths. After the potatoes are cut and sorted into different lengths, they are dipped into hot water blancher tanks to remove the excess sugars.

The potato products for Lines 1, 2, 3, and 4 are conveyed to steam-heated dryers to remove surface moisture. Once the surface moisture is removed, the potatoes in Line 1 and Line 4 are conveyed to the Line 1 and Line 4 fryers. Line 2 and Line 3 potatoes are formed into preformed potato products before being conveyed to the Line 2 and Line 3 fryers. Following the frying process, the final potato products are frozen and packaged for shipping. Emissions from the fryers and dryers are currently directed to a regenerative thermal oxidizer (RTO) to achieve a very high degree of emissions control.

Steam for process needs and building heat is provided by three boilers, each rated at 98 million British thermal units per hour (MMBtu/hr) on a higher heating value (HHV) basis. Simplot also operates an anaerobic digester and associated flare. Emergency internal combustion (IC) emergency engines provide power and firewater in case of an emergency.

Based on the refined PM and VOC emission data obtained from engineering tests performed in November 2019, Simplot is proposing to route emissions from the existing Line 1 and Line 4 dryers to the atmosphere through four rooftop vents (one vent per dryer zone).

Simplot will also install new Line 5 equipment, which include a natural gas-fired dryer with four low-NOx burners (total heat input capacity = 12.8 MMBtu/hr), steam-heated fryer, and associated product-conveying equipment. Line 5 will be capable of processing 40,000 lb/hour of conventional potato products. Emissions from the new dryer will be exhausted directly to the atmosphere through four new rooftop vents, and emissions from the new fryer will be controlled by the existing RTO. Steam for the new fryer will be supplied by the existing boilers. No other new emission units are proposed as part of the project.

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

2.2 Facility Location and Area Classification

The Simplot Caldwell plant site is located approximately two miles west of the City of Caldwell on Highway 19 in Canyon County, Idaho (Northing: 4,835,000 meters [m]; Easting: 521,500 m; UTM Zone 11), which is designated as an attainment or unclassifiable area for particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers (PM_{10}), particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers ($PM_{2.5}$), carbon monoxide (CO), ozone (O_3), sulfur dioxide (SO_2), nitrogen dioxide (NO_2), and lead (Pb). The area is not classified as non-attainment for any criteria pollutant.

The terrain is generally flat. The area surrounding the Simplot Caldwell facility is primarily rural.

2.3 Air Impact Analyses Required for All Permits to Construct

Idaho Air Rules Sections 203.02 and 203.03 state:

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

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

> ***02. Estimates of Ambient Concentrations***. *All estimates of ambient concentrations shall be based on the applicable air quality models, data bases, and other requirements specified in 40 CFR 51 Appendix W (Guideline on Air Quality Models).*

2.4 Significant Impact Level and Cumulative NAAQS Impact Analyses

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

The first phase of a NAAQS compliance demonstration is to evaluate whether the proposed facility/project could have a significant impact to ambient air. Section 3.1.1 of this memorandum describes the applicability evaluation of Idaho Air Rules Section 203.02. The Significant Impact Level (SIL) analysis for a new facility or proposed modification to a facility involves modeling estimated criteria air pollutant emissions from the facility or modification to determine the potential impacts to ambient air. Air impact analyses are required by Idaho Air Rules to be conducted in accordance with methods outlined in Appendix W. Appendix W requires that facilities be modeled using emissions and operations representative of design capacity or as limited by a federally enforceable permit condition.

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

Table 2. APPLICABLE REGULATORY LIMITS.

Pollutant	Averaging Period	Significant Impact Levels[a] ($\mu g/m^3$)[b]	Regulatory Limit[c] ($\mu g/m^3$)	Modeled Design Value Used[d]
PM_{10}[e]	24-hour	5.0	150[f]	Maximum 6th highest[g]
$PM_{2.5}$[h]	24-hour	1.2	35[i]	Mean of maximum 8th highest[j]
	Annual	0.2	12[k]	Mean of maximum 1st highest[l]
Carbon Monoxide (CO)	1-hour	2,000	40,000[m]	Maximum 2nd highest[n]
	8-hour	500	10,000[m]	Maximum 2nd highest[n]
Sulfur Dioxide (SO_2)	1-hour	3 ppb[o] (7.8 $\mu g/m^3$)	75 ppb[p] (196 $\mu g/m^3$)	Mean of maximum 4th highest[q]
	3-hour	25	1,300[m]	Maximum 2nd highest[n]
Nitrogen Dioxide (NO_2)	1-hour	4 ppb (7.5 $\mu g/m^3$)	100 ppb[s] (188 $\mu g/m^3$)	Mean of maximum 8th highest[t]
	Annual	1.0	100[r]	Maximum 1st highest[n]
Lead (Pb)	3-month[u]	NA	0.15[r]	Maximum 1st highest[n]
	Quarterly	NA	1.5[r]	Maximum 1st highest[n]
Ozone (O_3)	8-hour	40 TPY VOC[v]	70 ppb[w]	Not typically modeled

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

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

A cumulative NAAQS impact analysis for attainment area pollutants involves assessing ambient impacts (typically the design values consistent with the form of the standard) from potential/allowable emissions

resulting from the project and emissions from any nearby co-contributing sources (including existing emissions from the facility that are unrelated to the project), and then adding a DEQ-approved background concentration value to the modeled result that is appropriate for the criteria pollutant/averaging-period at the facility location and the area of significant impact. The resulting pollutant concentrations in ambient air are then compared to the NAAQS listed in Table 2. Table 2 also 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 an exceedance of NAAQS, a culpability analysis can determine if this exceedance is due to emissions from the proposed project. The permit may not be issued if the proposed project has a significant contribution (exceeding the SIL) to the modeled violation. If project-specific impacts are below the SIL, then the project does not have a significant contribution to the specific violations.

Compliance with Idaho Air Rules Section 203.02 is generally demonstrated if: a) applicable specific criteria pollutant emission increases are at a level defined as BRC, using the criteria established by DEQ regulatory interpretation[1]; or b) all modeled impacts of the SIL analysis are below the applicable SIL or other level determined to be inconsequential to NAAQS compliance; or c) modeled design values of the cumulative NAAQS impact analysis (modeling all emissions from the facility and co-contributing sources, and adding a background concentration) are less than applicable NAAQS at receptors where impacts from the proposed facility/modification exceeded the SIL or other identified level of consequence; or d) if the cumulative NAAQS analysis showed NAAQS violations, the impact of proposed facility/modification to any modeled violation was inconsequential (typically assumed to be less than the established SIL) for that specific receptor and for the specific modeled time when the violation occurred.

2.5 Toxic Air Pollutant Analyses

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

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

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

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

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

compliance with TAP requirements has been demonstrated.

Idaho Air Rules Section 210.20 states that if TAP emissions from a specific source are regulated by the Department or EPA under 40 CFR 60, 61, or 63, then a TAP impact analysis under Section 210 is not required for that TAP. The DEQ permit writer evaluates the applicability of specific TAPs to the Section 210.20 exclusion.

3.0 Analytical Methods and Data

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

3.1 Emission Source Data

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

Emission rates used in the impact modeling applicability analyses and any modeling analyses, as listed in this memorandum, should be reviewed by the DEQ permit writer and compared with those in the final emission inventory. All modeled criteria air pollutant and TAP emission rates must be equal to or greater than the facility's potential emissions calculated in the PTC emission inventory or proposed permit allowable emission rates.

3.1.1 Criteria Pollutant Modeling Applicability and Modeled Emission Rates

If a project would qualify for a Below Regulatory Concern (BRC) permit exemption as per Idaho Air Rules Section 221 if it were not for potential emissions of one or more pollutants exceeding the BRC threshold of 10 percent of emissions defined by Idaho Air Rules as "significant," then a NAAQS compliance demonstration may not be required for those pollutants with emissions below BRC levels. DEQ's regulatory interpretation policy of exemption provisions of Idaho Air Rules Section 221.01 is that: "*A DEQ NAAQS compliance assertion will not be made by the DEQ modeling group for specific criteria pollutants having a project emissions increase below BRC levels, provided the proposed project would have qualified for a Category I Exemption for BRC emissions quantities except for the emissions of another criteria pollutant.*[1]" The interpretation policy also states that the exemption criteria of uncontrolled potential to emit (PTE) not to exceed 100 ton/year (Idaho Air Rules Section 220.01.a.i) is not applicable when evaluating whether a NAAQS impact analysis is required. A permit will be issued limiting PTE below 100 ton/year, thereby negating the need to maintain calculated uncontrolled PTE under 100 ton/year.

The BRC exemption cannot generally be used to exempt a project from a pollutant-specific NAAQS compliance demonstration where a PTC is required for the action regardless of emission quantities, such as the modification of an existing emission or throughput limit. However, in this instance, if post-project facility-wide emissions of the criteria pollutant are also below BRC thresholds, then a NAAQS compliance demonstration is not required.

A NAAQS compliance demonstration must be performed for pollutant increases that would not qualify for the BRC exemption from the requirement to demonstrate compliance with NAAQS. DEQ established emission *de minimis* levels as a function of the Significant Emission Rates (SERs) defined in Idaho Air Rules Section 005.108. The SERs are expressed as annual emission rates. To use SERs for NAAQS with short-term averaging periods, the SER is divided by 8,760 hours/year and compared to maximum hourly emissions for 1-hour standards or maximum daily emissions divided by 24 for 24-hour standards. DEQ also developed SIL thresholds for modification projects; emissions less than these rates are reasonably assured to have impacts less than the applicable SIL.

A modeling applicability threshold assuring project impacts less than the SIL is used for modification projects to facilities where facility-wide NAAQS compliance demonstrations have not been recently performed. This threshold assures with high confidence that the project will not significantly contribute to any potentially existing NAAQS violation. These threshold values were based on modeling of a generic DEQ-generated facility, using the AERMOD regulatory model with Idaho meteorological data. The SIL thresholds are emission rates that, when modeled using the generic DEQ-generated facility, result in impacts just below the applicable SIL. Therefore, if emissions of a pollutant from affected units/processes are below SIL modeling thresholds, then air impact modeling is not necessary to confidently demonstrate that the proposed project will not cause or contribute to a NAAQS violation. If emissions from affected units/processes exceed SIL modeling thresholds, then air impact modeling is required for permitting.

If facility-wide NAAQS compliance modeling was performed within the previous five years, was representative of the existing facility and operations, and included the pollutant of interest, then an applicant may use $1/8^{th}$ of the SER or $1/8^{th}$ SER / 8,760 for short-term averages instead of the SIL thresholds. The $1/8^{th}$ SER thresholds are generally less restrictive than the SIL thresholds. Although the previous facility-wide modeling for the Simplot Caldwell facility was performed in December 2011, with the DEQ modeling memo issued March 27, 2012, DEQ determined that previous facility-wide NAAQS modeling was adequate to justify using the modeling thresholds based on $1/8^{th}$ of the SER for all criteria pollutants except PM_{10} and $PM_{2.5}$ (see e-mail from Kevin Schilling, DEQ, to Kyle Heitkamp, Ramboll, in Appendix C of PTC Application).

Table 3 provides a comparison between project-specific emission increases and $1/8^{th}$ SER thresholds. The SIL modeling thresholds for PM_{10} and $PM_{2.5}$ are also listed in Table 3.

Table 3. POLLUTANT-SPECIFIC MODELING APPLICABILITY.

Pollutant	Averaging Period	Emissions From Affected Units/ Processes	$1/8^{th}$ SER[a] Thresholds	Impact Modeling Required?
PM_{10}	24-hour	1.62 lb/hr[b]	0.43 (0.32[c])	Yes
$PM_{2.5}$	24-hour	1.62 lb/hr	0.29 (0.092[c])	Yes
	Annual	6.39 tpy[d]	1.25 (0.37[c])	Yes
Carbon Monoxide (CO)	1-hour, 8-hour	0.76 lb/hr	2.9	No
Sulfur Dioxide (SO_2)	1-hour, 3-hour	0.0075 lb/hr	1.14	No
Nitrogen Oxides (NOx)	1-hour	0.47 lb/hr	1.14	No
	Annual	2.04 tpy	5.0	No

a. Significant Emission Rates.
b. Pounds per hour.
c. Significant Impact Level modeling thresholds which are more restrictive than $1/8^{th}$ SER

thresholds and are applicable for facilities that have not previously demonstrated facility-wide NAAQS compliance modeling for the pollutant of interest.

d. Tons per year.

As shown in Table 3, the increase in emissions of PM_{10} on a 24-hour averaging basis and the increase in emissions of $PM_{2.5}$ on a 24-hour and annual averaging bases are greater than both 1/8[th] SER and SIL modeling thresholds. Therefore, dispersion modeling was required for 24-hour PM_{10} and 24-hour and annual $PM_{2.5}$.

Tables 4 and 5 list criteria pollutant emission rates used in the SIL and cumulative NAAQS impact analyses, respectively. The total modeled emission rates in the SIL analysis are equal to the emissions from affected units/processes listed in Table 3 above. The total modeled emission rates in the cumulative NAAQS impact analysis are equal to the facility-wide PTE listed in the updated emission inventory. Only 24-hour and annual $PM_{2.5}$ required cumulative NAAQS impact analyses.

Table 4. MODELED EMISSION RATES FOR SIL ANALYSIS.

Source ID	Description	24-hr $PM_{2.5}$ (lb/hr)[a]	Annual $PM_{2.5}$ (tpy)[b]	24-hr PM_{10} (lb/hr)
RTO	Regenerative Thermal Oxidizer	1.00E+00	4.38E+00	1.00E+00
L1DA	Line 1 Dryer A	5.00E-02	1.53E-01	5.00E-02
L1DB	Line 1 Dryer B	5.00E-02	1.53E-01	5.00E-02
L1DC	Line 1 Dryer C	5.00E-02	1.53E-01	5.00E-02
L1DD	Line 1 Dryer D	5.00E-02	1.53E-01	5.00E-02
L4DA	Line 4 Dryer A	5.00E-02	1.53E-01	5.00E-02
L4DB	Line 4 Dryer B	5.00E-02	1.53E-01	5.00E-02
L4DC	Line 4 Dryer C	5.00E-02	1.53E-01	5.00E-02
L4DD	Line 4 Dryer D	5.00E-02	1.53E-01	5.00E-02
L5DA	Line 5 Dryer A	5.36E-02	1.95E-01	5.36E-02
L5DB	Line 5 Dryer B	5.36E-02	1.95E-01	5.36E-02
L5DC	Line 5 Dryer C	5.36E-02	1.95E-01	5.36E-02
L5DD	Line 5 Dryer D	5.36E-02	1.95E-01	5.36E-02
Total Modeled Emission Rates		*1.62*	*6.39*	*1.62*

a. Pounds per hour.

b. Tons per year.

Table 5. MODELED EMISSION RATES FOR CUMULATIVE NAAQS IMPACT ANALYSIS.

Source ID	Description	24-hr $PM_{2.5}$ (lb/hr)[a]	Annual $PM_{2.5}$ (tpy)[b]
BLR_A	Boiler A	7.30E-01	3.20E+00
BLR_B	Boiler B	7.30E-01	3.20E+00
BLR_C	Boiler C	7.30E-01	3.20E+00
RTO	Regenerative Thermal Oxidizer	5.97E+00	2.04E+01
L1DA	Line 1 Dryer A	5.00E-02	1.53E-01
L1DB	Line 1 Dryer B	5.00E-02	1.53E-01
L1DC	Line 1 Dryer C	5.00E-02	1.53E-01
L1DD	Line 1 Dryer D	5.00E-02	1.53E-01
L4DA	Line 4 Dryer A	5.00E-02	1.53E-01
L4DB	Line 4 Dryer B	5.00E-02	1.53E-01
L4DC	Line 4 Dryer C	5.00E-02	1.53E-01
L4DD	Line 4 Dryer D	5.00E-02	1.53E-01
L5DA	Line 5 Dryer A	5.36E-02	1.95E-01
L5DB	Line 5 Dryer B	5.36E-02	1.95E-01
L5DC	Line 5 Dryer C	5.36E-02	1.95E-01
L5DD	Line 5 Dryer D	5.36E-02	1.95E-01

FLAREST	Flare (Short-term)	1.42E-01	0
FLARELT	Flare (Long-term)	0	4.43E-01
EG1	Warehouse Emergency Generator	9.64E-05	2.31E-04
EG2	Greenhouse Emergency Generator	2.50E-05	6.00E-05
EG3	Wastewater Emergency Generator	6.68E-03	1.60E-02
EG4	Tech Center Emergency Generator	1.21E-04	2.90E-04
EG5	HB Freezer Emergency Generator	3.56E-04	4.28E-03
EG6	Server Emergency Generator	8.02E-03	1.93E-02
FWP1	Firewater Engine	1.43E-02	3.44E-02
Total Modeled Emission Rates		*8.95*	*32.49*

a. Pounds per hour.
b. Tons per year.

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

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

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

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

3.1.2 TAPs Modeling Applicability and Modeled Emission Rates

Emission increases of arsenic, cadmium, chromium (VI), and formaldehyde exceed the applicable emission screening levels (ELs) of Idaho Air Rules Section 585 and 586. Air impact modeling analyses were then required to demonstrate that maximum impacts of arsenic, cadmium, chromium (VI), and formaldehyde are below applicable ambient increment standards expressed in Idaho Air Rules Section 585 and 586 as AACs and AACCs. Note that per IDAPA 58.01.01.210.20, no modeling is required to demonstrate compliance with TAP increments for TAPs that are hazardous air pollutants (HAPs), provided the source category is addressed by a New Source Performance Standards (NSPS) or National Emission Standard for Hazardous Air Pollutants (NESHAP). The DEQ permit writer evaluates the applicability of specific TAPs to the Section 210.20 exclusion.

Arsenic, cadmium, chromium (VI), and formaldehyde are carcinogenic TAPs that are regulated on a long-term averaging basis. Therefore, the appropriate emission rates for impact analyses are maximum annual emissions, expressed as an average pound/hour value over an 8,760-hour period.

Table 6 provides a summary of TAP emission increases for the four TAPs that had an increase exceeding the ELs of Idaho Air Rules Section 585 or 586.

Table 6. TAP EMISSION INCREASES THAT TRIGGER MODELING.

Toxic Air Pollutant	Emissions (lb/hr)[a]	Screening Emissions Level (lb/hr)
Arsenic[b]	2.51E-06	1.50E-06
Cadmium[b]	1.38E-05	3.70E-06
Chromium (VI)[b]	7.02E-07	5.60E-07
Formaldehyde[b]	9.40E-04	5.10E-04

a. Pounds per hour.
b. Carcinogenic TAP. ELs are annual maximum emissions expressed as pounds/hour. The emission rate is the annual emissions divided by 8,760 hours/year.

Table 7 lists the emission rates used in the TAPs impact analysis. The total modeled emission rate for all TAPs is equal to the emission increase for that TAP listed in Table 6.

Table 7. MODELED EMISSION RATES FOR TAPS IMPACT ANALYSIS.

Source ID	Description	Arsenic[a] (lb/hr)[b]	Cadmium[a] (lb/hr)	Chromium (VI)[a] (lb/hr)	Formaldehyde[a] (lb/hr)
L5DA	Line 5 Dryer A	6.27E-07	3.45E-06	1.75E-07	2.35E-04
L5DB	Line 5 Dryer B	6.27E-07	3.45E-06	1.75E-07	2.35E-04
L5DC	Line 5 Dryer C	6.27E-07	3.45E-06	1.75E-07	2.35E-04
L5DD	Line 5 Dryer D	6.27E-07	3.45E-06	1.75E-07	2.35E-04
Total Modeled Emission Rates		2.51E-06	1.38E-05	7.02E-07	9.40E-04

a. Carcinogenic TAP. The emission rate is the annual emissions divided by 8,760 hours/year.
b. Pounds per hour.

3.1.3 Emission Release Parameters

Table 8 lists the emission release parameters, including stack height, exhaust temperature, exhaust velocity, and stack diameter for all emission sources (English units are in parentheses). Emission point release parameters were based on information provided in the application. Justification for emission release parameters is summarized in the next section.

Table 8. POINT SOURCE EMISSION RELEASE PARAMETERS IN METRIC UNITS (ENGLISH UNITS IN PARENTHESES).

Release Point	Description	UTM[a] Coordinates		Stack Height in m (ft)[c]	Stack Exhaust Temp. in K (°F)[d]	Stack Exhaust Velocity in m/sec (fps)[e]	Stack Diameter in m (ft)	Orient. of Release[f]
		Easting-X in m[b]	Northing-Y in m					
BLR_A	Boiler A	521,973.00	4,834,927.00	21.3 (70.0)	333 (140)	12.7 (41.7)	1.07 (3.51)	D
BLR_B	Boiler B	521,973.00	4,834,919.00	21.3 (70.0)	333 (140)	12.7 (41.7)	1.07 (3.51)	D
BLR_C	Boiler C	521,974.00	4,834,914.00	21.3 (70.0)	333 (140)	12.7 (41.7)	1.07 (3.51)	D

RTO	Regenerative Thermal Oxidizer	522,021.00	4,834,932.00	25.9 (85.0)	406 (271)	11.0 (36.0)	2.13 (7.00)	D
L1DA	Line 1 Dryer A	521,939.40	4,834,918.40	16.9 (55.5)	314 (106)	9.8 (32.3)	0.64 (2.08)	D
L1DB	Line 1 Dryer B	521,939.00	4,834,923.60	16.9 (55.5)	314 (106)	9.8 (32.3)	0.64 (2.08)	D
L1DC	Line 1 Dryer C	521,938.90	4,834,929.90	16.9 (55.5)	314 (106)	9.8 (32.3)	0.64 (2.08)	D
L1DD	Line 1 Dryer D	521,939.20	4,834,943.70	16.9 (55.5)	314 (106)	9.8 (32.3)	0.64 (2.08)	D
L4DA	Line 4 Dryer A	521,925.90	4,834,918.40	16.9 (55.5)	314 (106)	9.8 (32.3)	0.64 (2.08)	D
L4DB	Line 4 Dryer B	521,925.80	4,834,923.60	16.9 (55.5)	314 (106)	9.8 (32.3)	0.64 (2.08)	D
L4DC	Line 4 Dryer C	521,925.60	4,834,929.90	16.9 (55.5)	314 (106)	9.8 (32.3)	0.64 (2.08)	D
L4DD	Line 4 Dryer D	521,925.00	4,834,935.50	16.9 (55.5)	314 (106)	9.8 (32.3)	0.64 (2.08)	D
L5DA	Line 5 Dryer A	521,898.47	4,834,999.60	16.9 (55.5)	322 (120)	17.0 (55.9)	0.56 (1.83)	D
L5DB	Line 5 Dryer B	521,898.47	4,835,005.03	16.9 (55.5)	322 (120)	16.4 (53.7)	0.56 (1.83)	D
L5DC	Line 5 Dryer C	521,898.21	4,835,010.47	16.9 (55.5)	322 (120)	17.8 (58.4)	0.56 (1.83)	D
L5DD	Line 5 Dryer D	521,898.21	4,835,015.64	16.9 (55.5)	322 (120)	17.0 (55.8)	0.56 (1.83)	D
FLAREST	Flare (short-term)	521,178.00	4,835,615.00	10.0 (32.8)	1,273 (1,832)	20.0 (65.6)	0.68 (2.23)	D
FLARELT	Flare (long-term)	521,178.00	4,835,615.00	9.4 (30.8)	1,273 (1,832)	20.0 (65.5)	0.57 (1.87)	D
EG1	Warehouse Emergency Generator	521,675.00	4,835,101.00	13.4 (44.0)	844 (1,060)	32.8 (107.7)	0.05 (0.16)	D
EG2	Greenhouse Emergency Generator	521,819.00	4,834,846.00	1.5 (4.9)	855 (1,080)	32.8 (107.7)	0.05 (0.16)	D
EG3	Wastewater Emergency Generator	521,308.00	4,835,272.00	2.4 (7.9)	844 (1,060)	50.0 (164.0)	0.06 (0.20)	D
EG4	Tech Center Emergency Generator	521,800.00	4,834,899.00	12.6 (41.3)	855 (1,080)	21.0 (68.9)	0.06 (0.20)	H
EG5	HB Freezer Emergency Generator	522,020.00	4,834,847.00	2.4 (8.0)	778 (941)	50.0 (164.0)	0.06 (0.20)	D
EG6	Server Emergency Generator	522,058.12	4,835,006.37	2.4 (8.0)	963 (1,274)	50.0 (164.0)	0.05 (0.17)	D
FWP1	Firewater Engine	521,681.00	4,834,838.00	3.7 (12.1)	728 (850)	50.0 (164.0)	0.13 (0.43)	H

[a] Universal Transverse Mercator.
[b] m: meters.
[c] ft: feet.
[d] K: Kelvin; ºF: degrees Fahrenheit.
[e] m/sec: meters per second; fps: feet per second.
[f] Orientation of release: D (default, vertical, uninterrupted release); H (horizontal release); R (rain-capped release).

3.1.4 Emission Release Parameter Justification

Boilers

Model IDs: BLR_A, BLR_B, and BLR_C

All three boilers, each rated at 98.0 MMBtu/hr on a higher heating value (HHV) basis, are equipped with an economizer. Simplot has source test data for Boiler C (BLR_C), but the test was conducted without the condensing economizer operating. Therefore the test conditions had higher exhaust temperatures and exhaust flow rates than estimated for condensing economizers. The modeling analysis conservatively assumed condensing economizer operations on all three boiler stacks. Exhaust temperature (140°F) and exhaust flow rate (24,088 actual cubic feet per minute [acfm]) were based on estimated operating conditions, with calculations provided in Appendix B of the PTC application.

Modeled stack height (70 feet) was based on a stack diagram submitted by Ramboll on July 14, 2021 as a response to DEQ's request for additional information. Ramboll asserted that the modeled exit diameter (3.51 feet) was based on the submitted stack diagram. However, DEQ's review indicates that the outer diameter at the point of exhaust to the atmosphere is 40 inches (3.33 feet) which suggests that the value that should have been used in the modeling analysis (inner diameter) is less than 3.33 feet. The applicant/consultant erred on the conservative side, calculating a lower exit velocity of 12.7 meter/second.

$$Boiler\ exit\ velocity = 24{,}088\frac{\cancel{feet^3}}{\cancel{minute}} \times \frac{4}{\pi(3.51\ \cancel{feet})^2} \times \frac{1\ \cancel{minute}}{60\ seconds} \times \frac{1\ meter}{3.28\ \cancel{feet}} = 12.7\frac{meter}{second}$$

DEQ is satisfied that the exhaust temperature, exhaust flow rate, and stack diameter values used in the model are adequately conservative for the source given the impact modeling results and other conservative assumptions made in model inputs and settings. All boilers were modeled with vertical, uninterrupted release.

DEQ review concluded that the release parameters used for all three boilers in the air impact analyses were conservative and acceptable.

Regenerative Thermal Oxidizer

Model ID: RTO

The RTO controls all dryer and fryer emissions. Modeled exhaust temperature (406 Kelvin) and exhaust flow rate (83,200 acfm) for the RTO were based on a September 30, 2014 source test. Modeled values were based on the average of three runs.

Modeled stack height (85 feet) was based on a stack diagram submitted by Ramboll on July 14, 2021 as a response to DEQ's request for additional information. Ramboll asserted that the modeled exit diameter (7.0 feet) was based on the submitted stack diagram. However, DEQ's review indicates that the modeled exit diameter is actually the outer diameter at the point of exhaust to the atmosphere, which suggests that the value that should have been used in the modeling analysis (inner diameter) is less than 7.0 feet. The applicant/consultant erred on the conservative side, calculating a lower exit velocity of 11.0 meter/second.

$$RTO\ exit\ velocity = 83{,}200\frac{\cancel{feet^3}}{\cancel{minute}} \times \frac{4}{\pi(7.0\ \cancel{feet})^2} \times \frac{1\ \cancel{minute}}{60\ seconds} \times \frac{1\ meter}{3.28\ \cancel{feet}} = 11.0\frac{meter}{second}$$

DEQ is satisfied that the exhaust temperature, exhaust flow rate, and stack diameter values used in the model are adequately conservative for the source given the impact modeling results and other conservative assumptions made in model inputs and settings. The RTO was modeled with vertical, uninterrupted release.

Modeled release parameters for the RTO were reasonably documented and justified.

Lines 1 and 4 Dryer Exhausts

Model IDs: L1DA, L1DB, L1DC, L1DD, L4DA, L4DB, L4DC, and L4DD

The project proposes to vent the existing mainline dryers (Line 1 and Line 4) directly to the atmosphere instead of through the RTO. The stack height (55.5 feet) and exit diameter (2.08 feet) for the mainline dryers were based on engineering specifications for the new stacks and must be verified upon final construction. Exhaust temperature (106°F) and exhaust air flow (6,600 acfm) were based on actual measured values from a November 2019 engineering test for the four dryer ducts on Line 4. The corresponding exit velocity is 9.8 meter/second.

$$Lines\ 1\ and\ 4\ Dryer\ exit\ velocity = 6{,}600 \frac{\cancel{feet^3}}{\cancel{minute}} \times \frac{4}{\pi(2.08\ \cancel{feet})^2} \times \frac{1\ \cancel{minute}}{60\ seconds} \times \frac{1\ meter}{3.28\ \cancel{feet}} = 9.8 \frac{meter}{second}$$

Exhaust stacks for the Lines 1 and 4 Dryer were modeled with vertical, uninterrupted release.

Modeled release parameters for the Lines 1 and 4 Dryer were adequately documented and justified.

Line 5 Dryer Exhausts

Model IDs: L5DA, L5DB, L5DC, and L5DD

Stack height (55.5 feet) and exit diameter (1.83 feet) for the new Line 5 Dryer were based on engineering specifications and must be verified upon final construction. Note that the exit diameter for Line 5 Dryer exhausts is slightly smaller than for Lines 1 and 4 Dryer. Ramboll asserted that anticipated temperature for the new dryer ranges between 120 and 140°F; the lowest value (120°F) was selected for modeling purposes. Exhaust flow, which was different for each dryer duct, was obtained from design estimates provided by Twin City Fan. Exit velocities for each of the four vents range from 16.4 to 17.8 meter/second.

$$L5DA\ exit\ velocity = 8{,}878 \frac{\cancel{feet^3}}{\cancel{minute}} \times \frac{4}{\pi(1.83\ \cancel{feet})^2} \times \frac{1\ \cancel{minute}}{60\ seconds} \times \frac{1\ meter}{3.28\ \cancel{feet}} = 17.0 \frac{meter}{second}$$

$$L5DB\ exit\ velocity = 8{,}504 \frac{\cancel{feet^3}}{\cancel{minute}} \times \frac{4}{\pi(1.83\ \cancel{feet})^2} \times \frac{1\ \cancel{minute}}{60\ seconds} \times \frac{1\ meter}{3.28\ \cancel{feet}} = 16.4 \frac{meter}{second}$$

$$L5DC\ exit\ velocity = 9{,}247 \frac{\cancel{feet^3}}{\cancel{minute}} \times \frac{4}{\pi(1.83\ \cancel{feet})^2} \times \frac{1\ \cancel{minute}}{60\ seconds} \times \frac{1\ meter}{3.28\ \cancel{feet}} = 17.8 \frac{meter}{second}$$

$$L5DD\ exit\ velocity = 8{,}836\frac{\cancel{feet^3}}{\cancel{minute}} \times \frac{4}{\pi(1.83\ \cancel{feet})^2} \times \frac{1\ \cancel{minute}}{60\ seconds} \times \frac{1\ meter}{3.28\ \cancel{feet}} = 17.0\frac{meter}{second}$$

All exhaust points for the new dryer were modeled with vertical, uninterrupted release.

Although release parameters for the new Line 5 Dryer are slightly different from the existing Lines 1 and 4 Dryer, they appear reasonable for the source and were appropriately justified in the application.

Flare

Model IDs: FLAREST and FLARELT

Exhaust parameters for the biogas flare for short-term (FLAREST) and long-term (FLARELT) modeling were derived in accordance with EPA-450/4-88-010, *Screening Procedures for Estimating the Air Quality Impact of Stationary Sources*[3]. The referenced flare method sets the exit gas velocity and temperature constant at 20 meter/second and 1,273 Kelvin, respectively. The stack diameter (*D*) was then calculated based on the heat released from the combustion of gases in the flare using the following equation:

$$D = 9.88 \times 10^{-4}(q_n)^{0.5}$$

where

D: effective stack diameter in meters; and
q_n: net heat released in calories/second.

The net heat released (q_n) was calculated from the gross heat released using the following equation:

$$q_n = 0.45q$$

where

q: gross heat released in calories/second.

For short-term modeling, *q* was calculated using the following equation:

$$q = \left(\frac{Flare\ Heat\ Capacity\ MMBtu}{hour}\right) \times \left(\frac{1{,}000{,}000\ Btu}{1\ MMBtu}\right) \times \left(\frac{252\ calories}{Btu}\right) \times \left(\frac{1\ hour}{3{,}600\ seconds}\right)$$

$$q = \left(\frac{19.0\ \cancel{MMBtu}}{\cancel{hour}}\right) \times \left(\frac{1{,}000{,}000\ \cancel{Btu}}{1\ \cancel{MMBtu}}\right) \times \left(\frac{252\ calories}{\cancel{Btu}}\right) \times \left(\frac{1\ \cancel{hour}}{3{,}600\ seconds}\right)$$

$$q = 1{,}333{,}950\ calories/second$$

Using a *q* value of 1,333,950 calories/second, a net heat release (q_n) of 466,882 calories/second was calculated, giving a final effective diameter (*D*) of 0.68 meters for short-term modeling.

For long-term modeling, *q* was calculated using the following equation:

$$q = \left(\frac{Flare\ Heat\ Capacity\ MMBtu}{year}\right) \times \left(\frac{1{,}000{,}000\ Btu}{1\ MMBtu}\right) \times \left(\frac{252\ calories}{Btu}\right) \times \left(\frac{1\ year}{8{,}760\ hours}\right) \times \left(\frac{1\ hour}{3{,}600\ seconds}\right)$$

$$q = \left(\frac{118{,}856\ \cancel{MMBtu}}{\cancel{year}}\right) \times \left(\frac{1{,}000{,}000\ \cancel{Btu}}{1\ \cancel{MMBtu}}\right) \times \left(\frac{252\ calories}{\cancel{Btu}}\right) \times \left(\frac{1\ \cancel{year}}{8{,}760\ \cancel{hours}}\right) \times \left(\frac{1\ \cancel{hour}}{3{,}600\ seconds}\right)$$

$$q = 950{,}380\ calories/second$$

Using a q value of 950,380 calories/second, a net heat release (q_n) of 332,633 calories/second was calculated, giving a final effective diameter (D) of 0.57 meters for long-term modeling.

An effective stack height was also calculated using the following equation:

$$H_e = H_a + [(4.56 \times 10^{-3})(q^{0.478})]$$

where

H_e: effective stack height in meters; and
H_a: actual height of flare at tip in meters.

The actual stack height (H_a) is 6.1 meters, giving effective heights (H_e) of 10.0 meters and 9.4 meters for short-term modeling and long-term modeling, respectively.

The flare was modeled with vertical, uninterrupted release. DEQ review concluded that the release parameters used for the biogas flare in the air impact analyses were conservative and acceptable.

Emergency Generators and Firewater Engine

Model IDs: EG1-EG6 and FWP1

For testing and maintenance purposes, all seven emergency engines were modeled to operate at 100 hours/year for up to 30 minutes/day.

The listed manufacturer for the Greenhouse emergency generator (EG2) is Olympian (0.12 MMBtu/hr). Exhaust temperature (1,080°F) and exhaust flow rate (141 acfm) were based on the manufacturer's sheet for standby mode. EG2 is natural gas-fired. In their response to DEQ's request for additional information, Ramboll asserted that the exhaust discharge was measured with a diameter of 2 inches (0.16 feet) exiting from the generator enclosure at 5 feet above ground level. The corresponding exit velocity is 35.6 meter/second but it was conservatively modeled with a lower exit velocity (32.8 meter/second). EG2 was modeled with vertical, uninterrupted release.

The listed manufacturer for the Wastewater emergency generator (EG3) is Cummins (1.04 MMBtu/hr). Exhaust temperature (1,060°F) and exhaust flow rate (800 acfm) were based on the manufacturer's sheet for standby mode. EG3 is diesel-fired. The exhaust discharge was measured with a diameter of 2.5 inches (0.20 feet) exiting from the generator enclosure at 8 feet above ground level. EG2 was modeled with vertical, uninterrupted release with an exit velocity of 50 meter/second.

The listed manufacturer for the High Bay Freezer emergency generator (EG5) is Power Solutions

International (1.80 MMBtu/hr). Exhaust temperature (941°F) was based on the manufacturer's sheet. EG2 is natural gas-fired. The exhaust discharge was measured with a diameter of 6 inches (0.50 feet) exiting from the generator enclosure at 80 inches (6.67 feet) above ground level. However, EG5 was modeled with a diameter of 2.5 inches (0.20 feet) and a stack height of 8 feet based on stack estimates at the time the application was submitted. EG5 was modeled with vertical, uninterrupted release with an exit velocity of 50 meter/second. Given that particulate emissions from the emergency engines are minimal, DEQ accepted the modeled stack parameters for EG5.

The listed manufacturer for the Firewater pump engine (FWP1) is Cummins (2.22 MMBtu/hr). Exhaust temperature (850°F) and exhaust flow rate (2,225 acfm) were based on the manufacturer's sheet at full load. Exit diameter (5 inches = 0.43 feet) was also based on the manufacturer's sheet. FWP1 is diesel-fired. The exhaust discharge was measured at 12 feet above ground level. FWP1 was modeled with horizontal release with an exit velocity of 50 meter/second.

No specification sheets were provided for the Warehouse (EG1; 0.46 MMBtu/hr), Tech Center (EG4; 0.12 MMBtu/hr), and Server (EG6; 1.24 MMBtu/hr) emergency generators. However, the submitted emission inventory lists the manufacturers as Onan, Dayton, and Kohler, respectively. EG1 and EG4 are natural gas-fired while EG6 is diesel-fired. In their response to DEQ's request for additional information, Ramboll stated that stack heights and exit diameters for EG1, EG4, and EG6 were field-measured. Modeled exhaust temperatures and exit velocities were derived from similar-sized engines and fuels. EG1 and EG6 were modeled with vertical, uninterrupted release while EG4 was modeled with horizontal release.

DEQ is satisfied that all exhaust parameters for the emergency engines used in the model are acceptable for the sources given the impact modeling results and other conservative assumptions made in model inputs and settings. Particulate emissions from the emergency engines are very minimal.

3.2 Background Concentrations

Background concentrations are used if a cumulative NAAQS impact analysis is needed to demonstrate compliance with applicable NAAQS. Background design values (DV) for all criteria pollutants and averaging periods were obtained from the Northwest International Air Quality Environmental Science and Technology Consortium (NW AIRQUEST; https://arcg.is/1jXmHH) using the project site coordinates. These background air pollutant levels, listed below in Table 9, are based on regional-scale air pollution modeling of pollutants in Washington, Oregon, and Idaho, with modeling results adjusted according to available monitoring data.

Table 9. DEQ-RECOMMENDED CRITERIA POLLUTANT AMBIENT BACKGROUND CONCENTRATIONS.

Pollutant	Averaging Period	Background Concentration (μg/m^3)[a,b]
$PM_{2.5}$	24-hour	27.3
	Annual	8.1

a. Micrograms per cubic meter, except where noted otherwise.
b. NW AIRQUEST ambient background lookup tool, mid 2014–mid 2017.

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 Impact Analyses

Ramboll performed the project-specific air pollutant emission inventory and air impact analyses that were submitted with the application. The submitted information/analyses, in combination with results from DEQ's air impact 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>
<tr><th colspan="3">Table 10. MODELING PARAMETERS.</th></tr>
<tr><th>Parameter</th><th>Description/Values</th><th>Documentation/Addition Description</th></tr>
<tr><td>General Facility Location</td><td>Caldwell, Idaho</td><td>The area is an attainment or unclassified area for all criteria pollutants.</td></tr>
<tr><td>Model</td><td>AERMOD</td><td>AERMOD with the PRIME downwash algorithm, version 21112.</td></tr>
<tr><td>Meteorological Data</td><td>Boise surface station;
Boise upper air station</td><td>The meteorological model input files for this project were developed by DEQ. The data were processed using the latest version of AERMET (version 19191) and the "ADJ_U*" option. See Section 3.3.5 of this memorandum for additional details of the meteorological data.</td></tr>
<tr><td>Terrain</td><td>Considered</td><td>AERMAP version 18081 was used to process terrain elevation data for all buildings and receptors. See Section 3.3.6 for more details.</td></tr>
<tr><td>Building Downwash</td><td>Considered</td><td>Plume downwash was considered for the structures associated with the facility. BPIP-PRIME was used to evaluate building dimensions for consideration of downwash effects in AERMOD. See Section 3.3.7 for more details.</td></tr>
<tr><td>NOx Chemistry</td><td>Not Considered</td><td>NOx was not modeled in this project.</td></tr>
<tr><td rowspan="8">Receptor Grid</td><td colspan="2">SIL Analysis
The selection of receptors for use in the SIL analysis is as follows (see Section 3.3.10 for more details):</td></tr>
<tr><td>Grid 1</td><td>25-meter spacing along the ambient air boundary.</td></tr>
<tr><td>Grid 2</td><td>25-meter spacing from ambient air boundary out to 250 meters.</td></tr>
<tr><td>Grid 3</td><td>50-meter spacing in a 3,300 meter (Easting) by 3,300 meter (Northing) grid centered on the facility.</td></tr>
<tr><td>Grid 4</td><td>200-meter spacing in a 6,400 meter (Easting) by 6,400 meter (Northing) grid centered on the facility.</td></tr>
<tr><td>Grid 5</td><td>500-meter spacing in a 20,000 meter (Easting) by 20,000 meter (Northing) grid centered on the facility.</td></tr>
<tr><td colspan="2">Cumulative NAAQS Impact Analysis
The same receptor grid was used for the cumulative NAAQS impact analysis as for the SIL analysis.</td></tr>
<tr><td colspan="2">TAPs Impact Analysis
The same receptor grid was used for the TAPs impact analysis as for the SIL analysis.</td></tr>
</table>

3.3.2 Modeling Protocol

Ramboll submitted a modeling protocol to DEQ on May 19, 2021, and Ramboll discussed modeling methodology and criteria pollutant modeling thresholds with DEQ staff on June 1, 2021. An e-mail from Kevin Schilling, DEQ, on June 10, 2021 confirmed modeling was required for PM_{10} and $PM_{2.5}$, in addition to applicable TAPs. No protocol approval was sent to Ramboll because the application was submitted before DEQ's typical modeling protocol review period.

3.3.3 Modeling Methodology

Project-specific modeling and other required impact analyses were generally conducted using data and methods described in the *Idaho Air Quality Modeling Guideline*. [2]

3.3.4 Model Selection

Idaho Air Rules Section 202.02 requires that estimates of ambient concentrations be based on air quality models specified in Appendix W. 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 it includes more advanced algorithms to assess turbulent mixing processes in the planetary boundary layer for both convective and stable stratified layers.

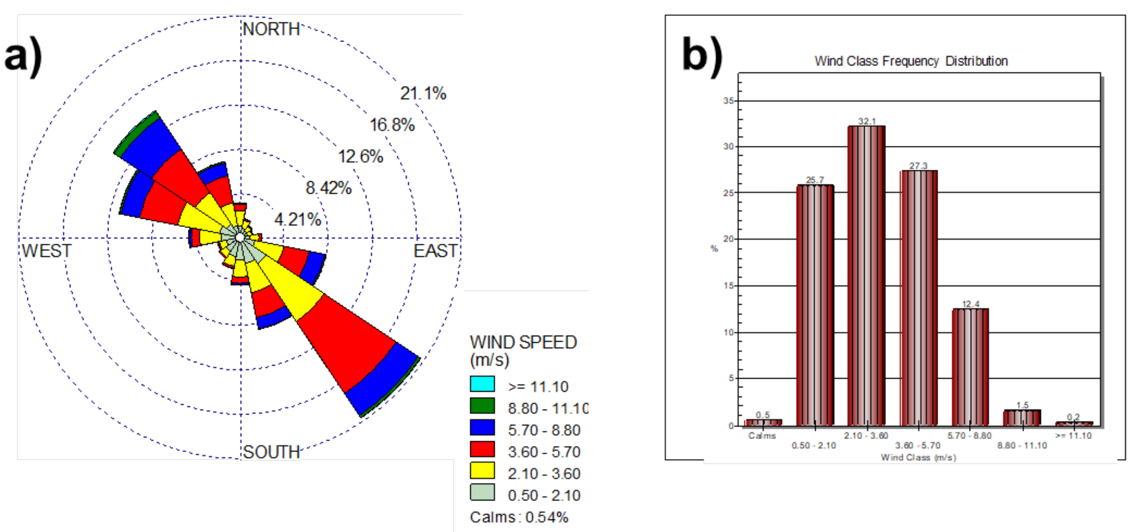
AERMOD version 21112 was used by Ramboll for the modeling analyses to evaluate impacts of the facility. This version was the current version at the time the application was received by DEQ.

3.3.5 Meteorological Data

DEQ processed a meteorological dataset from Boise, Idaho (KBOI; station ID 726810-24131) covering the years 2014-2018. The upper air soundings required by AERMET were obtained from the Boise airport station (site ID 24131). Surface characteristics were determined by DEQ staff using AERSURFACE version 13016. DEQ modeling staff evaluated annual moisture conditions for the AERSURFACE runs based on thirty years of Boise airport precipitation data. Conditions were determined to be “wet” for 2014 and 2017, and “average” for 2015, 2016, and 2018. Average moisture content is defined as within a 30 percentile of the 30-year mean of 11.3 inches.

Figure 1 shows a wind rose and wind speed histogram at Boise Airport. AERMINUTE version 15272 was used to process Automated Surface Observing Systems (ASOS) wind data for use in AERMET. AERMET version 19191 was used to process surface and upper air data and to generate a model-ready meteorological data input file. The “adjust u star” (ADJ_U*) option was applied in AERMET to enhance model performance during low wind speeds under stable conditions. DEQ provided meteorological data to the applicant, with and without the ADJ_U* option enabled. In the submitted modeling report, Ramboll used the meteorological data with the ADJ_U* option enabled. DEQ determined that these data are adequately representative of the meteorology at the Simplot Caldwell site for minor source permitting.

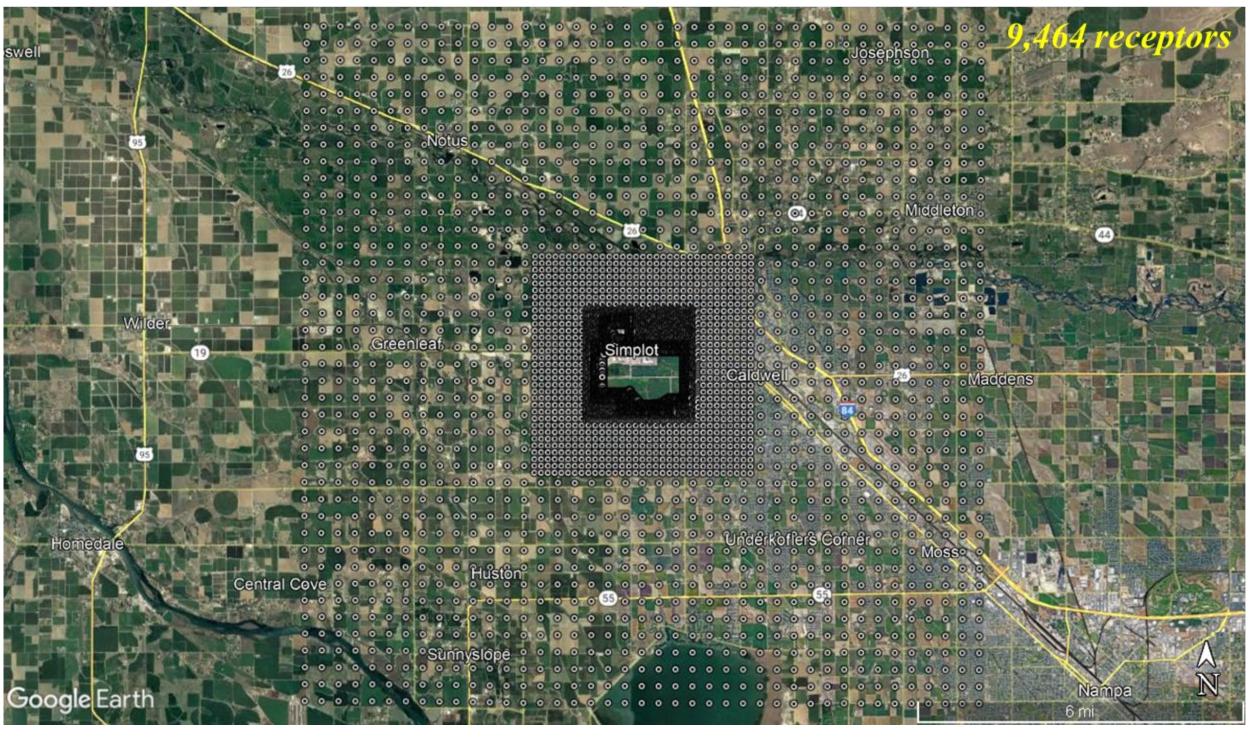
Figure 1. (a) WIND ROSE AND (b) WIND SPEED HISTOGRAM AT BOISE AIRPORT IN IDAHO (2014-2018).



3.3.6 Effects of Terrain on Modeled Impacts

Submitted ambient air impact analyses used terrain data extracted from United States Geological Survey (USGS) National Elevation Dataset (NED) 1/3-arc second TIFF files. The terrain preprocessor AERMAP version 18081 was used by Ramboll 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. Figure 2 depicts the receptor grid used in the analyses, overlaid on a terrain image from Google Earth.

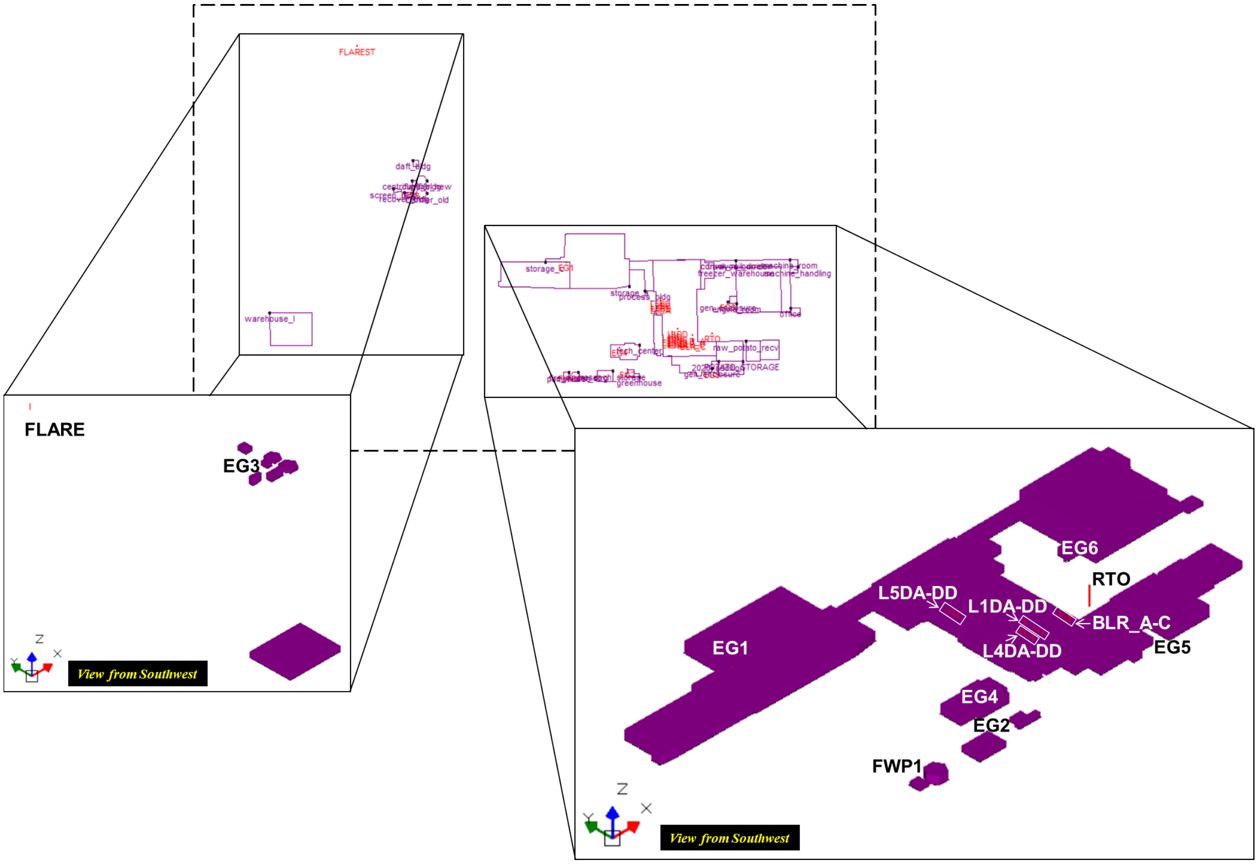
Figure 2. THE FULL RECEPTOR GRID CENTERED AT THE J.R. SIMPLOT FACILITY IN CALDWELL, IDAHO.



3.3.7 Facility Layout and Downwash

Figure 3 illustrates the facility's model setup showing locations of buildings and all modeled emission sources. The two insets illustrate three-dimensional views of the western and eastern sections of the model setup as viewed from the southwest.

Figure 3. J.R. SIMPLOT CALDWELL'S MODEL SETUP SHOWING EMISSION SOURCES, AND THREE-DIMENSIONAL VIEW OF THE MODEL SETUP AS VIEWED FROM THE SOUTHWEST.



DEQ verified proper identification of the site location, equipment locations, and the ambient air boundary by comparing a graphical representation of the modeling input file to aerial photographs on Google Earth (available at https://www.google.com/earth).

Potential downwash effects on emission 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 buildings were used as input to the Building Profile Input Program for the Plume Rise Model Enhancements downwash algorithm (BPIP-PRIME version 04274) to calculate direction-specific dimensions and Good Engineering Practice (GEP) stack height information for input to AERMOD.

3.3.8 NOx Chemistry

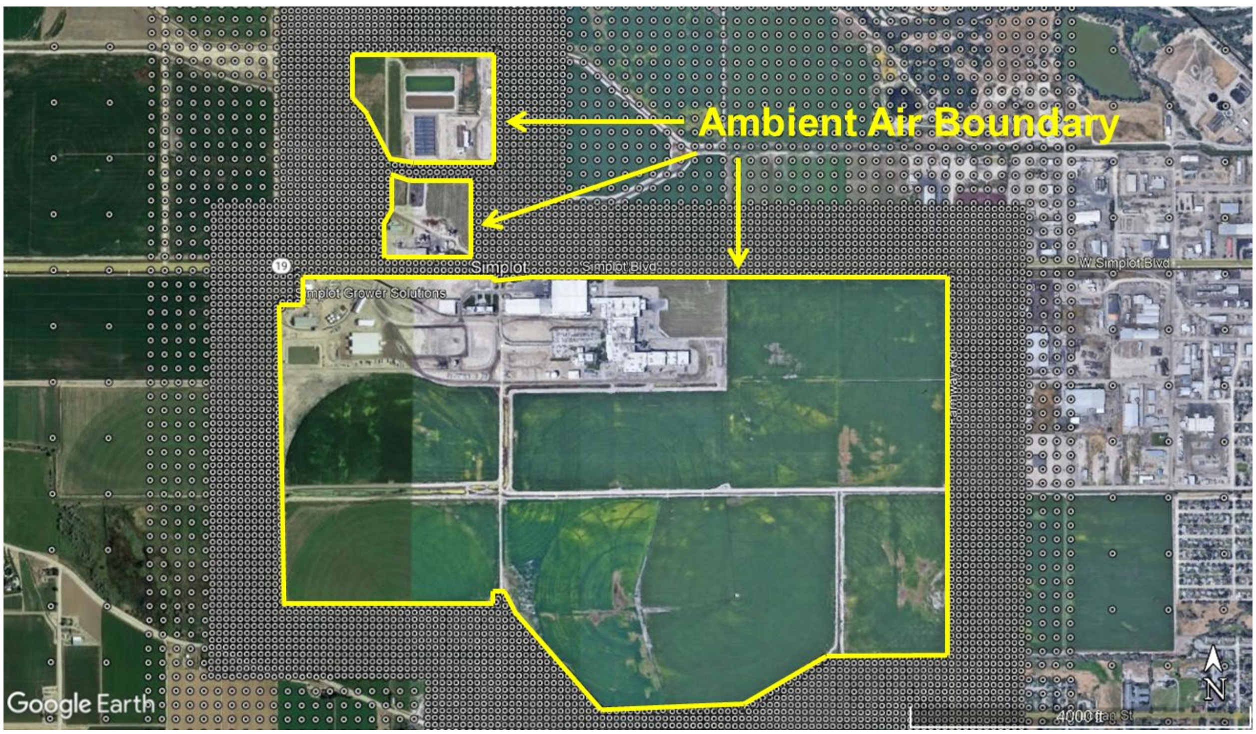
NOx was not required to be modeled in this permitting project.

3.3.9 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." The general public is precluded from entering the Simplot Caldwell facility and from entering a large portion of agricultural land surrounding the facility by

means of fencing and "No Trespassing" signs. The processing plant is located within a fenced area, and much of the surrounding fields are gated to prevent the general public from entering Simplot-owned property. Highway 19 (Simplot Boulevard) is located north of the main processing area and abuts the site and was therefore modeled as ambient air. The canal and access road that transect Simplot's wastewater treatment area and Highway 19 were treated as ambient air (see ambient air boundary and inner receptor grid illustrated in Figure 4 below). In general, public access to Simplot's properties is discouraged through the use of "No Trespassing" signs placed along property boundaries and through the use of security guards that require any trespassers to leave the property.

Figure 4. J.R. SIMPLOT CALDWELL'S AMBIENT AIR BOUNDARY.



DEQ has determined that measures described in the application to preclude public access to areas of the site excluded from ambient air are adequate.

3.3.10 Receptor Network

Table 10 describes the receptor network used in the submitted modeling analyses. The receptor grids used in the model provided good resolution of the maximum design concentrations for the project and provided extensive coverage. The selection of receptors was as follows:

- Discrete receptors every 25 meters around the ambient air boundary.
- A 25-meter grid from the ambient air boundary out to 250 meters.
- A 50-meter grid in a 3,300 meter (Easting) by 3,300 meter (Northing) grid centered on the facility.
- A 200-meter grid in a 6,400 meter (Easting) by 6,400 meter (Northing) grid centered on the facility.

- A 500-meter grid in a 20,000 meter (Easting) by 20,000 meter (Northing) grid centered on the facility.

The full receptor grid consists of 9,464 receptors and is depicted in Figure 2. The full receptor grid was used for the SIL, cumulative NAAQS impact, and TAPs analyses. DEQ determined that the receptor grid used in the submitted modeling analysis was adequate to resolve maximum modeled impacts.

The receptor grid used in the submitted modeling analyses met the minimum recommendations specified in the *Idaho Air Quality Modeling Guideline*[2], and DEQ determined that the receptor network was effective in reasonably assuring compliance with applicable air quality standards at all ambient air locations.

3.3.11 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.

Sources from the Simplot Caldwell facility are below GEP stack height. Therefore, consideration of downwash caused by nearby buildings was required.

4.0 NAAQS and TAPs Impact Modeling Results

This section describes the air impact modeling results for both NAAQS and TAPs analyses.

4.1 Results for NAAQS Analyses

4.1.1 Significant Impact Level Analysis

Table 11 provides results for the significant impact level (SIL) analysis. It shows that the maximum predicted impacts from the facility are above the SIL for 24-hour and annual $PM_{2.5}$. Therefore, a cumulative NAAQS impact analysis was performed for 24-hour and annual $PM_{2.5}$.

Table 11. RESULTS FOR SIGNIFICANT IMPACT LEVEL ANALYSIS.

Pollutant	Averaging Period	Maximum Modeled Impact ($\mu g/m^3$)[a]	Significant Impact Level (SIL) ($\mu g/m^3$)	Percent of SIL	Cumulative NAAQS Impact Analysis Required?
$PM_{2.5}$	24-hour	2.3	1.2	191.7%	Yes
	Annual	0.48	0.2	240.0%	Yes

PM_{10}	24-hour	2.9	5.0	58.0%	No

[a] Micrograms per cubic meter.

4.1.2 Cumulative NAAQS Impact Analysis

Table 12 provides results for the cumulative NAAQS impact analysis. For each modeled pollutant, the total impact was calculated by adding the design value (DV) of the impact to the ambient background value. The sum was then compared to the NAAQS. Ambient impacts for the facility, when combined with approved ambient backgrounds, were below the NAAQS at all receptors. Note that the 24-hour and annual $PM_{2.5}$ ambient background concentrations represent a significant portion (83.7% and 85.3%, respectively) of the total impact.

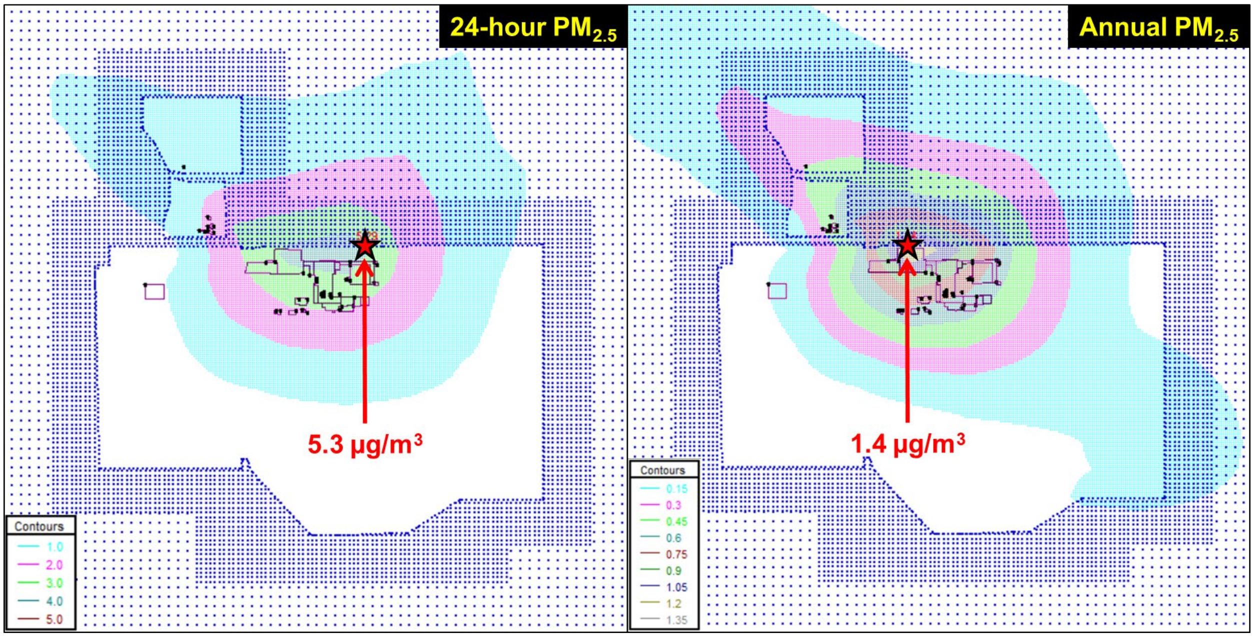
Table 12. RESULTS FOR CUMULATIVE NAAQS IMPACT ANALYSIS.

Pollutant	Averaging Period	Modeled Design Value Concentration (μg/m³)[a]	Background Concentration (μg/m³)	Total Ambient Impact (μg/m³)	NAAQS (μg/m³)	Percent of NAAQS
$PM_{2.5}$	24-hour	5.3	27.3	32.6	35	93.1%
	Annual	1.4	8.1	9.5	12	79.2%

[a] Micrograms per cubic meter.

Figure 5 illustrates the maximum modeled design concentrations for all pollutants and averaging periods that were modeled in the cumulative NAAQS impact analysis. The red star denotes the location of maximum impacts. High impacts are limited to a relatively small area close to the facility, mostly along the northern section of the ambient air boundary (along Highway 19/Simplot Boulevard).

Figure 5. MAXIMUM MODELED DESIGN CONCENTRATIONS FOR CUMULATIVE NAAQS IMPACT ANALYSIS.



4.2 Results for TAPs Impact Analyses

Dispersion modeling was required to demonstrate compliance with TAP increments specified by Idaho Air Rules Section 585 and 586 for those TAPs with emission increases exceeding screening emission levels. Table 13 lists the maximum modeled impacts for the four carcinogenic TAPs that required modeling. All modeled impacts are safely below applicable AACCs.

Table 13. TAPS AIR IMPACT ANALYSIS RESULTS.

TAP	Maximum Modeled Impact ($\mu g/m^3$)[a]	AAC or AACC ($\mu g/m^3$)	Percent of AAC/AACC
Arsenic[b]	2.8E-06	2.30E-04	1.2%
Cadmium[b]	1.7E-05	5.60E-04	3.0%
Chromium (VI)[b]	8.4E-07	8.30E-05	1.0%
Formaldehyde[b]	1.1E-03	7.70E-02	1.4%

a. Micrograms per cubic meter.

b. Carcinogenic TAP. Modeled impact and AACC represent annual or period-average concentration.

5.0 Conclusions

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

References

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

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

3. *Screening Procedures for Estimating the Air Quality Impact of Stationary Sources.* EPA-450/4-88-010. U.S. Environmental Protection Agency. Office of Air and Radiation and Office of Air Quality Planning and Standards. Research Triangle Park, NC. August 1988.

APPENDIX C – FACILITY DRAFT COMMENTS

The following comments were received from the facility on September 27, 2021:

Facility Comment: PTC Condition 3.12 requires a follow-up NO_x and CO source test on a Boiler within two years of the November 26, 2013 initial test. To prevent confusion on timing of future tests, can we revise this condition to reflect the most recent boiler test date of September 12, 2019. Simplot is currently in the process of conducting a new Boiler source test within the next week or so.

DEQ Response: The language in PTC Condition 3.12 can be updated to clearly state the boiler test schedule based what tests have already occurred: Boiler C was initially tested on November 14, 2013. Boiler B was tested on November 13, 2015. Boiler A was tested on October 24, 2017. Boiler C was tested again on September 12, 2019. Therefore, the next test shall be conducted on Boiler B by September 12, 2021.

Facility Comment: PTC Condition 2.11 restarts the NO_x and $PM_{2.5}$ source testing requirement on the RTO (within 180 days of permit issuance), and we are not sure why this is necessary for this permit modification. The draft Statement of Basis (Page 15) indicates Condition 2.11 was revised at the advice of Zack Klotovich because 19 of 24 sample results were below method detection limits. That may have been the case of dryer and fryer emission data used during initial permitting of the RTO back in 2011; however, Simplot has successfully completed two source tests of the RTO (Sept. 30, 2014 & Sept. 12-13, 2019) showing that actual NO_x and $PM_{2.5}$ emissions from the RTO were less than 75% of the emission limits.

This permit modification further reduces $PM_{2.5}$ emissions from the RTO by removing the Line 1 and Line 4 dryer emissions from the RTO. Simplot requests the first sentence of PTC Condition 2.11 be revised as follows, "The permittee shall conduct performance tests on the RTO stack to demonstrate compliance with NO_x and $PM_{2.5}$ emissions limits by September 12, 2024." The proposed permit condition language is similar to the language in existing PTC Condition 2.10 and reflects the most recent source test was less than 75% of NO_x and $PM_{2.5}$ emission limits.

DEQ Response: Regarding permit condition 2.11, DEQ believes the reason to test the RTO again does not have to do with the 19 of 24 sample results from the dryer engineering being below method detection limits, like stated in the draft statement of basis. The reason for a new RTO test would be because Simplot is adding an additional fryer that will be controlled by the RTO. According to the past dryer engineering tests, the emissions from the dryers are very low, so it appears the dryers don't contribute much toward the RTO. However DEQ doesn't know how adding an additional fryer to the RTO will affect it, which is why DEQ thinks resetting the RTO test schedule based on operation of the new fryer would be appropriate. That is why the RTO test should be 180 days after the new Line 5 fryer commences operation.

The reason to test the new Line 5 dryer emissions (PC 2.12) is because 19 of 24 sample results from the line 4 dryer engineering tests were below method detection limits. In the draft statement of basis, the justification discussion regarding the line 4 dryer engineering tests referenced the wrong condition and was moved from PC 2.11 to PC 2.12.

APPENDIX D – PROCESSING FEE

PTC Processing Fee Calculation Worksheet

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

Company:	**J R Simplot CO – Caldwell Facility**
Address:	**16733 Simplot Blvd.**
City:	**Caldwell**
State:	**ID**
Zip Code:	**83607**
Facility Contact:	**John Prigge**
Title:	**Environmental Engineering Manager**
AIRS No.:	**027-00131**

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	2.0	0	2.0
SO_2	0.0	0	0.0
CO	3.3	0	3.3
PM10	0.0	11.67	-11.7
VOC	56.4	0	56.4
Total:	0.0	11.67	**50.2**
Fee Due	**$ 5,000.00**		

Comments: