Statement of Basis

Permit to Construct No. P-2013.0037
Project ID 61225

J.R. Simplot Co. - Conda Pumping Station
Soda Springs, Idaho

Facility ID 029-00040

Final

September 6, 2013
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Permit Writer

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

ACRONYMS, UNITS, AND CHEMICAL NOMENCLATURE

AAC	acceptable ambient concentrations
AACC	acceptable ambient concentrations for carcinogens
acfm	actual cubic feet per minute
ASTM	American Society for Testing and Materials
BACT	Best Available Control Technology
BMP	best management practices
Btu	British thermal units
CAA	Clean Air Act
CAM	Compliance Assurance Monitoring
CAS No.	Chemical Abstracts Service registry number
CBP	concrete batch plant
CEMS	continuous emission monitoring systems
cfm	cubic feet per minute
CFR	Code of Federal Regulations
CI	compression ignition
CMS	continuous monitoring systems
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	CO_2 equivalent emissions
COMS	continuous opacity monitoring systems
DEQ	Department of Environmental Quality
dscf	dry standard cubic feet
EL	screening emission levels
EPA	U.S. Environmental Protection Agency
FEC	Facility Emissions Cap
GHG	greenhouse gases
gph	gallons per hour
gpm	gallons per minute
gr	grains (1 lb = 7,000 grains)
HAP	hazardous air pollutants
HHV	higher heating value
HMA	hot mix asphalt
hp	horsepower
hr/yr	hours per consecutive 12 calendar month period
ICE	internal combustion engines
IDAPA	a numbering designation for all administrative rules in Idaho promulgated in accordance with the Idaho Administrative Procedures Act
iwg	inches of water gauge
km	kilometers
lb/hr	pounds per hour
lb/qtr	pound per quarter
m	meters
MACT	Maximum Achievable Control Technology
mg/dscm	milligrams per dry standard cubic meter
MMBtu	million British thermal units
MMscf	million standard cubic feet
NAAQS	National Ambient Air Quality Standard
NESHAP	National Emission Standards for Hazardous Air Pollutants
NO_2	nitrogen dioxide
NO_x	nitrogen oxides
NSPS	New Source Performance Standards

O&M	operation and maintenance
O_2	oxygen
PAH	polyaromatic hydrocarbons
PC	permit condition
PCB	polychlorinated biphenyl
PERF	Portable Equipment Relocation Form
PM	particulate matter
$PM_{2.5}$	particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers
PM_{10}	particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers
POM	polycyclic organic matter
ppm	parts per million
ppmw	parts per million by weight
PSD	Prevention of Significant Deterioration
psig	pounds per square inch gauge
PTC	permit to construct
PTC/T2	permit to construct and Tier II operating permit
PTE	potential to emit
PW	process weight rate
RAP	recycled asphalt pavement
RFO	reprocessed fuel oil
RICE	reciprocating internal combustion engines
Rules	*Rules for the Control of Air Pollution in Idaho*
scf	standard cubic feet
SCL	significant contribution limits
SIP	State Implementation Plan
SM	synthetic minor
SM80	synthetic minor facility with emissions greater than or equal to 80% of a major source threshold
SO_2	sulfur dioxide
SO_x	sulfur oxides
T/day	tons per calendar day
T/hr	tons per hour
T/yr	tons per consecutive 12 calendar month period
T2	Tier II operating permit
TAP	toxic air pollutants
TEQ	toxicity equivalent
T-RACT	Toxic Air Pollutant Reasonably Available Control Technology
ULSD	ultra-low sulfur diesel
U.S.C.	United States Code
VOC	volatile organic compounds
yd^3	cubic yards
$\mu g/m^3$	micrograms per cubic meter

FACILITY INFORMATION

Description

J.R. Simplot Company (Simplot) owns and operates a phosphate rock slurry pumping station (the Conda Pumping Station) in Caribou County on property near Conda, Idaho (about 7 miles Northeast of Soda Springs). This pumping station is part of a system that is used for transporting phosphate rock from Simplot's Smokey Canyon Mine located near Afton, Wyoming to Simplot's fertilizer manufacturing operation at the Don Plant located near Pocatello, Idaho. The ore is mined and crushed at Simplot's Smokey Canyon Mine located near Afton, Wyoming and then transported by truck to the Conda Pumping Station. The pumping station currently is an exempt source of air emissions and therefore does not have an air permit. The only emission sources currently at the facility are diesel-fired IC engines that power emergency electrical generators. The emergency IC engines are exempt from permitting pursuant to IDAPA 58.01.01.222.01.d.

Permitting History

This is the initial PTC for an existing permit exempt facility thus there is no permitting history.

Application Scope

Simplot is planning a project to install a small-scale calciner at its Conda Pumping Station property. Calcination is a thermal treatment process in the presence of air applied to ore material to bring about a thermal decomposition, a phase transition, or the removal of a volatile fraction. The calcination process normally takes place at temperatures below the melting point of the product materials. The calciner will be operated as a pilot project and on a temporary basis to determine whether the concept of calcining certain phosphate rock from the Smoky Canyon mine is a feasible means of beneficiation.

The maximum design capacity of the pilot calciner system is approximately one ton per hour. Simplot anticipates that the unit could operate 24 hours per day, 7 days per week with a maximum annual processing rate of 2,800 tons. The equipment to be installed and operated at Simplot's Conda site to support the pilot calciner beneficiation project includes the following:

- An open receiving/raw rock storage pile,
- A raw rock feed hopper and feed screw conveyor,
- A small-scale calciner that will be equipped with a cyclone for emissions control and product recovery, and a wet scrubber for emissions control. The calciner primarily combusts VOCs contained within the ore which is being processed by the calciner. In addition, the calciner will be equipped with a 2.0 MMBtu natural gas-fired burner to provide supplemental heat during operation (if needed) as well as to pre-heat the unit at startup; and
- An open product storage bin and/or an open product storage pile.

Application Chronology

June 5, 2013	DEQ received an application and an application fee.
June 20 – July 12, 2013	DEQ provided an opportunity to request a public comment period on the application and proposed permitting action.
June 20, 2013	DEQ approved pre-permit construction.
July 2, 2013	DEQ determined that the application was complete.
August 13, 2013	DEQ made available the draft permit and statement of basis for peer and regional office review.
August 15, 2013	DEQ made available the draft permit and statement of basis for applicant review.

August 27, 2013	DEQ received the permit processing fee.
September 6, 2013	DEQ issued the final permit and statement of basis.

TECHNICAL ANALYSIS

Emissions Units and Control Equipment

Table 1 EMISSIONS UNIT AND CONTROL EQUIPMENT INFORMATION

Source ID No.	Sources	Control Equipment	Emission Point ID No.
PC01	Calciner: Manufacturer: Custom built Model: N/A Burner Model: Maxon 3 Kinemax Manufacture Date: 2013 Heat input rating: 2.0 MMBtu/hr Max. throughput: 0.75 T/hr, 2,800 T/yr Supplemental Fuel: Natural gas only Primary Fuel: Ore	Calciner Cyclone: Manufacturer: Custom built – refractory lined Model: N/A Designed flowrate: 500-2,500 scfm Pressure drop: 2-8 in-H_2O $PM_{10}/PM_{2.5}$ control efficiency: 75% Calciner Wet Scrubber: Manufacturer: Custom built Model: N/A Type: Gentrified/Venturi/Packed Bed Liquor flow: 6-14 gpm Pressure drop: 40-50 in-H_2O PM_{10} control efficiency: 98% SO_2 control efficiency: 80%	(EP-01) Calciner Exhaust Stack: Exit height: 40 ft (12.2 m) Exit diameter: 0.5 ft (0.15 m) Exit flow rate: 700 acfm Exit temperature: 120 °F (48.9 °C)
Materials Handling	Materials handling: Open receiving/raw rock storage pile Raw rock feed hopper and feed screw conveyor Open product storage bin and/or open product storage pile	All reasonable precautions shall be taken to prevent particulate matter from becoming airborne	N/A

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 calciner and materials handling operations at the facility (see Appendix A) associated with this proposed project. Emissions estimates of criteria pollutants, GHGs, and HAPs PTE were based on emission factors from source testing, AP-42, throughput of 0.75 T/hr and 2,800 tons of ore per year, and process information specific to the facility for this proposed project.

Uncontrolled Potential to Emit

Using the definition of Potential to Emit, uncontrolled Potential to Emit is then defined as the maximum capacity of a facility or stationary source to emit an air pollutant under its physical and operational design. Any physical or operational limitation on the capacity of the facility or source to emit an air pollutant, including air pollution control equipment and restrictions on hours of operation or on the type or amount of material combusted, stored or processed, shall **not** be treated as part of its design **since** the limitation or the effect it would have on emissions **is not** state or federally enforceable.

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

The following table presents the uncontrolled Potential to Emit for regulated air pollutants as calculated by DEQ staff. See Appendix A for a detailed presentation of the calculations and the assumptions used to determine emissions for each emissions unit. For this calciner operation uncontrolled Potential to Emit is based upon normal operation of the facility without the benefit of the operation of the control devices.

Table 2 UNCONTROLLED POTENTIAL TO EMIT FOR REGULATED AIR POLLUTANTS

Source	$PM_{10}/PM_{2.5}$	SO_2	NO_X	CO	VOC	CO_2e	F	H_2SO_4
	T/yr	T/yr	T/yr	T/yr	T/yr	T/yr	T/yr	T/yr
Point Sources								
Calciner	422.0	11.35	1.96	0.57	0.09	1,717	0.31	0.02
Total, Point Sources	**422.00**	**11.35**	**1.96**	**0.57**	**0.09**	**1,717**	**0.31**	**0.02**

The following table presents the uncontrolled Potential to Emit for HAP pollutants as submitted by the Applicant and verified by DEQ staff. See Appendix A for a detailed presentation of the calculations and the assumptions used to determine emissions for each emissions unit. For this calciner operation controlled PTE is assumed to be the same as uncontrolled PTE.

Table 3 UNCONTROLLED POTENTIAL TO EMIT FOR HAZARDOUS AIR POLLUTANTS

Hazardous Air Pollutants	PTE (T/yr)
Acenaphthene	6.6E-09
Anthracene	8.8E-09
Benzo(a)anthracene	6.6E-09
Benzene	7.7E-06
Benzo(a)pyrene	4.4E-09
Benzo(b)fluoranthene	6.6E-09
Benzo(k)fluoranthene	6.6E-09
Chrysene	6.6E-09
Dibenzo(a,h)anthracene	4.4E-09
Dichlorobenzene	4.4E-06
7,12-Dimethylbenz(a)anthracene	5.9E-08
Fluoranthene	1.1E-08
Fluorene	1.0E-08
Formaldehyde	2.7E-04
Hexane	**2.9E-03**
Indeno(1,2,3-cd)pyrene	6.6E-09
2-Methylnaphthalene	8.8E-08
3-Methylchloranthrene	6.6E-09
Naphthalene	2.2E-06
Phenanthrene	6.2E-08
Pyrene	1.8E-08
Total PAH	2.9E-08
Toluene	1.2E-05
Arsenic	5.9E-05
Beryllium	3.3E-06
Cadmium	1.1E-03
Chromium (VI)	2.0E-04
Cobalt	5.0E-06
Manganese	1.3E-04
Mercury	1.4E-06
Nickel	9.4E-05
Selenium	5.5E-05
Total	**0.0048**

Pre-Project Potential to Emit

Pre-project Potential to Emit is used to establish the change in emissions at a facility as a result of this project. This is a new facility. Therefore, pre-project emissions are set to zero for all criteria pollutants.

Post Project Potential to Emit

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

The following table presents the post project Potential to Emit for criteria and GHG pollutants from all emissions units at the facility as determined by 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 4 POST PROJECT POTENTIAL TO EMIT FOR REGULATED AIR POLLUTANTS

Source	$PM_{10}/PM_{2.5}$		SO_2		NO_X		CO		VOC		CO_2e		F		H_2SO_4	
	lb/hr[a]	T/yr[b]	lb/hr[a]	T/yr[b]	lb/hr[a]	T/yr[b]	lb/hr[a]	T/yr[b]	lb/hr[a]	T/yr[b]	lb/hr[a]	T/yr[b]	lb/hr[a]	T/yr[b]	lb/hr[a]	T/yr[b]
Calciner	1.13	2.11	1.2	2.27	1.05	1.96	0.31	0.57	0.05	0.09	920	1,717	0.16	0.31	0.01	0.02
Post Project Totals	**1.13**	**2.11**	**1.20**	**2.27**	**1.05**	**1.96**	**0.31**	**0.57**	**0.05**	**0.09**	**920**	**1,717**	**0.16**	**0.31**	**0.01**	**0.02**

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

Change in Potential to Emit

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

Table 5 CHANGES IN POTENTIAL TO EMIT FOR REGULATED AIR POLLUTANTS

Source	$PM_{10}/PM_{2.5}$		SO_2		NO_X		CO		VOC		CO_2e		F		H_2SO_4	
	lb/hr[a]	T/yr[b]	lb/hr[a]	T/yr[b]	lb/hr[a]	T/yr[b]	lb/hr[a]	T/yr[b]	lb/hr[a]	T/yr[b]	lb/hr[a]	T/yr[b]	lb/hr[a]	T/yr[b]	lb/hr[a]	T/yr[b]
Pre-Project Potential to Emit	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Post Project Potential to Emit	1.13	2.11	1.2	2.27	1.05	1.96	0.31	0.57	0.05	0.09	920	1,717	0.16	0.31	0.01	0.02
Changes in Potential to Emit	**1.13**	**2.11**	**1.20**	**2.27**	**1.05**	**1.96**	**0.31**	**0.57**	**0.05**	**0.09**	**920**	**1,717**	**0.16**	**0.31**	**0.01**	**0.02**

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.

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 6 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)
o-Dichlorobenzene	0.0	2.4E-06	0.0000024	20	No
Hexane	0.0	1.6E-03	0.0016	12	No
Nitrous Oxide	0.0	3.9E-04	0.0004	6	No
Naphthalene	0.0	1.2E-06	0.000001	3.33	No
Toluene	0.0	6.7E-06	0.000007	25	No
Barium	0.0	4.3E-08	0.00000004	0.033	No
Cobalt metal, dust, and fume	0.0	2.7E-06	0.000003	0.0033	No
Copper fume	0.0	8.3E-09	0.000000008	0.013	No
Fluorides, as F	0.0	1.6E-01	0.1600	0.167	No
Manganese fume	0.0	6.8E-05	0.00007	0.067	No
Molybdenum soluble compounds	0.0	1.1E-08	0.00000001	0.333	No
Sulfuric Acid	0.0	9.0E-08	0.00000009	0.067	No
Selenium	0.0	3.0E-05	0.00003	0.013	No
Vanadium	0.0	2.3E-08	0.00000002	0.003	No
Zinc oxide dust	0.0	1.9E-03	0.0019	0.667	No

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

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 7 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)
2-Methylnaphthalene (PAH)	0.0	2.0E-08	0.00000002	9.1E-05	No
3-Methylchloranthrene	0.0	1.5E-09	0.000000002	2.5E-06	No
7,12-Dimethylbenz(a)Anthracene (PAH)	0.0	1.3E-08	0.00000001	9.1E-05	No
Acenaphthene (PAH)	0.0	1.5E-09	0.000000002	9.1E-05	No
Anthracene (PAH)	0.0	2.0E-09	0.000000002	9.1E-05	No
Benzene	0.0	1.8E-06	0.000002	8.0E-04	No
Benzo(a)pyrene	0.0	1.0E-09	0.000000001	2.0E-06	No
Benzo(g,h,i)perylene (PAH)	0.0	1.0E-09	0.000000001	9.1E-05	No
Fluoranthene (PAH)	0.0	2.5E-09	0.000000003	9.1E-05	No
Formaldehyde	0.0	6.3E-05	0.00006	5.1E-04	No
Phenathrene (PAH)	0.0	1.4E-08	0.00000001	9.1E-05	No
Pyrene (PAH)	0.0	4.2E-09	0.000000004	9.1E-05	No
Total POMs[a]	0.0	6.5E-09	0.000000007	2.0E-06	No
Arsenic compounds	**0.0**	**1.3E-05**	**0.00001**	**1.5E-06**	**Yes[b]**
Beryllium & compounds	0.0	7.5E-07	0.0000008	2.8E-05	No
Cadmium & compounds	**0.0**	**2.4E-04**	**0.0002**	**3.7E-06**	**Yes**
Chromium (VI)	**0.0**	**4.6E-05**	**0.00005**	**5.6E-07**	**Yes**
Nickel	0.0	2.1E-05	0.00002	2.7E-05	No

a) Polycyclic Organic Matter (POM) is considered as one TAP comprised of: benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, dibenzo(a,h)anthracene, chrysene, indeno(1,2,3-cd)pyrene, benzo(a)pyrene. The total is compared to benzo(a)pyrene.
b) Modeling was not required per IDAPA 58.01.01.215.15, see discussion below.

Some of the PTEs for carcinogenic TAP were exceeded as a result of this project. Therefore, modeling is required for arsenic compounds, cadmium and compounds, and chromium IV because the annual average carcinogenic screening ELs identified in IDAPA 58.01.01.586 were exceeded. However, per Section 215.15 "For short term sources, the applicant may utilize a short term adjustment factor of ten (10). For a carcinogen, multiply either the applicable acceptable ambient concentration (AACC) or the screening emission rate, but not both, by ten (10), to demonstrate preconstruction compliance. This method may be used for TAPs listed in Section 586 only and may be utilized in conjunction with standard methods for quantification of emission rates." The Applicant applied this allowance to arsenic emissions for this project. Therefore, modeling was not required for arsenic emissions for this project.

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 8 HAZARDOUS AIR POLLUTANTS EMISSIONS POTENTIAL TO EMIT SUMMARY

Hazardous Air Pollutants	PTE (lb/hr)	PTE (T/yr)
2-Methylnaphthalene	2.0E-08	0.00000009
3-Methylchloranthrene	1.5E-09	0.000000007
7,12-Dimethylbenz(a)Anthracene	1.3E-08	0.00000006
Acenaphthene	1.5E-09	0.000000007
Anthracene	2.0E-09	0.000000009
Benzo(a)Anthracene	1.5E-09	0.000000007
Benzene	1.8E-06	0.000008
Benzo(a)pyrene	1.0E-09	0.000000004
Benzo(b)fluoranthene	1.5E-09	0.000000007
Benzo(k)fluoranthene	1.5E-09	0.000000007
Chrysene	1.5E-09	0.000000007
Dibnezno(a,h)anthracene	1.0E-09	0.000000004
Dichlorobenzene	1.0E-06	0.00000438
Fluoranthene	2.51E-09	0.000000011
Fluorene	2.34E-09	0.000000010
Formaldehyde	6.27E-05	0.000275
Hexane	**6.69E-04**	**0.00293**
Indeno(1,2,3-cd)pyrene	1.5E-09	0.000000007
Naphthalene	5.1E-07	0.00000223
Phenanthrene	1.42E-08	0.00000006
Pyrene	4.18E-09	0.000000018
Total PAHs	6.52E-09	0.0000000286
Toluene	2.84E-06	0.00001244
Arsenic	1.34E-05	0.0000587
Beryllium	7.54E-07	0.0000033
Cadmium	2.41E-04	0.00106
Chromium (VI)	4.61E-05	0.000202
Cobalt	1.15E-06	0.000005
Manganese	2.90E-05	0.0001270
Mercury	3.25E-07	0.0000014
Nickel	2.14E-05	0.000094
Selenium	1.26E-05	0.000055
Totals	**0.001104**	**0.00484**

Ambient Air Quality Impact Analyses

As presented in the Modeling Memo in Appendix B, the estimated emission rates of 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 Caribou 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

"Synthetic Minor" classification for criteria pollutants is defined as the uncontrolled Potential to Emit for criteria pollutants are above the applicable major source thresholds and the Potential to Emit for criteria pollutants fall below the applicable major source thresholds. Therefore, the following table compares the uncontrolled Potential to Emit and the Potential to Emit for criteria pollutants to the Major Source thresholds to determine if the facility will be "Synthetic Minor."

[1] Criteria pollutant thresholds in Table 1, State of Idaho Air Quality Modeling Guideline, Doc ID AQ-011, rev. 1, December 31, 2002.

Table 9 UNCONTROLLED PTE AND PTE FOR REGULATED AIR POLLUTANTS COMPARED TO THE MAJOR SOURCE THRESHOLDS

Pollutant	Uncontrolled PTE (T/yr)	PTE (T/yr)	Major Source Thresholds (T/yr)	Uncontrolled PTE Exceeds the Major Source Threshold and PTE Exceeds the Major Source Threshold?
$PM_{10}/PM_{2.5}$	422.0	2.11	100	Yes, No
SO_2	11.35	2.27	100	No
NO_x	1.96	1.96	100	No
CO	0.57	0.57	100	No
VOC	0.09	0.09	100	No
CO_2e	1,717	1,717	100,000	No
F	0.31	0.31	100	No
H_2SO_4	0.02	0.02	100	No

"Synthetic Minor" classification for HAP pollutants is defined as the uncontrolled Potential to Emit for HAP pollutants are above the applicable major source thresholds and the Potential to Emit for HAP pollutants fall below the applicable major source thresholds. Therefore, the following table compares the uncontrolled Potential to Emit and the Potential to Emit for HAP pollutants to the Major Source thresholds to determine if the facility will be "Synthetic Minor."

Table 10 UNCONTROLLED PTE AND PTE FOR HAZARDOUS AIR POLLUTANTS COMPARED TO THE MAJOR SOURCE THRESHOLDS

HAP Pollutant	Uncontrolled PTE (T/yr)	PTE (T/yr)	Major Source Thresholds (T/yr)	Uncontrolled PTE Exceeds the Major Source Threshold and PTE Exceeds the Major Source Threshold?
2-Methylnaphthalene	0.00000009	0.00000009	10	No
3-Methylchloranthrene	0.000000007	0.000000007	10	No
7,12-Dimethylbenz(a)Anthracene	0.00000006	0.00000006	10	No
Acenaphthene	0.000000007	0.000000007	10	No
Anthracene	0.000000009	0.000000009	10	No
Benzo(a)Anthracene	0.000000007	0.000000007	10	No
Benzene	0.000008	0.000008	10	No
Benzo(a)pyrene	0.000000004	0.000000004	10	No
Benzo(b)fluoranthene	0.000000007	0.000000007	10	No
Benzo(k)fluoranthene	0.000000007	0.000000007	10	No
Chrysene	0.000000007	0.000000007	10	No
Dibnezno(a,h)anthracene	0.000000004	0.000000004	10	No
Dichlorobenzene	0.00000438	0.00000438	10	No
Fluoranthene	0.000000011	0.000000011	10	No
Fluorene	0.000000010	0.000000010	10	No
Formaldehyde	0.000275	0.000275	10	No
Hexane	0.00293	0.00293	10	No
Indeno(1,2,3-cd)pyrene	0.000000007	0.000000007	10	No
Naphthalene	0.00000223	0.00000223	10	No
Phenanthrene	0.00000006	0.00000006	10	No
Pyrene	0.00000018	0.00000018	10	No
Total PAHs	0.0000000286	0.0000000286	10	No
Toluene	0.00001244	0.00001244	10	No
Arsenic	0.0000587	0.0000587	10	No
Beryllium	0.0000033	0.0000033	10	No
Cadmium	0.00106	0.00106	10	No
Chromium (VI)	0.000202	0.000202	10	No
Cobalt	0.000005	0.000005	10	No
Manganese	0.0001270	0.0001270	10	No
Mercury	0.0000014	0.0000014	10	No
Nickel	0.000094	0.000094	10	No
Selenium	0.000055	0.000055	10	No
Total	**0.00484**	**0.00**	**25**	No

As demonstrated in Table 9, the facility has an uncontrolled potential to emit for $PM_{10}/PM_{2.5}$ emissions greater than the Major Source threshold of 100 T/yr (all other pollutants are below the Major Source thresholds). In addition, as demonstrated in Table 10 the facility has uncontrolled potential HAP emissions of less than the Major Source threshold of 10 T/yr and for all HAP combined less than the Major Source threshold of 25 T/yr. Therefore, this facility is designated as a Synthetic Minor facility for $PM_{10}/PM_{2.5}$ emissions.

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

Tier II Operating Permit (IDAPA 58.01.01.401)

IDAPA 58.01.01.401 Tier II Operating Permit

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

Visible Emissions (IDAPA 58.01.01.625)

IDAPA 58.01.01.625 Visible Emissions

The sources of PM_{10} emissions at this facility are subject to the State of Idaho visible emissions standard of 20% opacity. This requirement is assured by Permit Conditions 2.4 and 3.2.

Rules for Control of Fugitive Dust (IDAPA 58.01.01.650)

IDAPA 58.01.01.650 Rules for Control of Fugitive Dust

The sources of fugitive PM_{10} emissions at this facility are subject to the State of Idaho control of fugitive dust requirements. This requirement is assured by Permit Conditions 3.2 and 3.3.

Standards for New Sources (IDAPA 58.01.01.676)

IDAPA 58.01.01.676 Standards for New Sources

This Rule states that "A person shall not discharge into the atmosphere from any fuel burning equipment with a maximum rated input of ten (10) million BTU's per hour or more, and commencing operation on or after October 1, 1979, particulate matter in excess of the concentrations shown in the following table:..." The calciner has a heat input of 2.0 MMBtu/hr. Therefore, the requirements of this Rule are not applicable to the calciner and no further discussion is required.

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

IDAPA 58.01.01.701 Particulate Matter – New Equipment Process Weight Limitations

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

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

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

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

For 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 calciner emissions unit proposed to be installed as a result of this project with a proposed throughput of 1,500 lb/hr, E is calculated as follows:

Therefore, E is calculated as:

$E = 0.045 \times PW^{0.60} = 0.045 \times (1{,}500)^{0.60} = 3.62$ lb-PM/hr

As presented previously in the Emissions Inventories Section of this evaluation the post project PTE for this emissions unit is 1.13 lb-PM_{10}/hr. Assuming PM is 50% PM_{10} means that PM emissions will be 2.26 lb-PM/hr (1.13 lb-PM_{10}/hr ÷ 0.5 lb-PM_{10}/lb-PM). Therefore, compliance with this requirement has been demonstrated.

Rules for Control of Fluoride Emissions (IDAPA 58.01.01.750)

IDAPA 58.01.01.750 Rules for Control of Fluoride Emissions

The Rule states that the purpose of Sections 750 through 751 is to prevent the emission of fluorides such that the accumulation of fluorine in feed and forage for livestock does not exceed the safe limits specified below.

Specifically Section 751.01 states that "No person shall allow, suffer, cause or permit the discharge into the atmosphere of total fluoride emissions in gaseous and in particulate form, expressed as fluoride (F-), from the phosphate fertilizer plant sources listed in Subsection 751.03 in excess of thirty hundredths (0.30) pounds of fluoride per ton of P_2O_5 input to the calciner operation, calculated at maximum rated capacity." The Rule goes on to state that "To assure compliance with Subsection 751.01, the Director shall specify methods for calculating total allowable emissions and shall issue source specific permits containing emission limitations for the following sources *within* phosphate fertilizer plants:..." As the proposed calciner operation for this project is not located within a phosphate fertilizer plant the requirements of this Rule are not applicable and no further discussion is required.

Rules for the Control of Nonmetallic Mineral Processing Plants (IDAPA 58.01.01.790)

IDAPA 58.01.01.790 Rules for the Control of Nonmetallic Mineral Processing Plants

The purpose of Sections 790 through 799 is to set forth the requirements for nonmetallic mineral processing plants, frequently referred to as rock crushers. Definitions specific to nonmetallic mineral processing permits are located in Section 011 while other general terms may be defined in Sections 006 through 008. Compliance with Section 790 does not relieve the owner or operator of a nonmetallic mineral processing plant from the responsibility of complying with other federal, state, and local applicable laws, regulations, and requirements. The Conda Pumping station, where the new calciner has been proposed to operate, does not have an ore crushing operation located at the facility. Therefore, the requirements of this Rule are not applicable and no further discussion is required.

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

IDAPA 58.01.01.301 Requirement to Obtain Tier I Operating Permit

IDAPA 58.01.01.006 defines a Tier I source as "Any source located at a major facility as defined in Section 008." IDAPA 58.01.01.008.10 defines a Major Facility as either:

- For HAP a facility with the potential to emit ten (10) tons per year (T/yr) or more of any hazardous air pollutant, other than radionuclides, or
- The facility emits or has the potential to emit twenty-five (25) T/yr or more of any combination of any hazardous air pollutants, other than radionuclides.

or, for non-attainment areas:

- The facility emits or has the potential to emit one hundred (100) tons per year or more of any regulated air pollutant. The fugitive emissions shall not be considered in determining whether the facility is major unless the facility is a "Designated Facility":

Therefore, it needs to be determined if this facility is a HAP Major Source. The following table compares this facility's post-project facility-wide annual PTE for all HAP emitted by the source to the HAP Major Source thresholds in order to determine if this facility is a HAP Major Source.

Table 11 PTE FOR THE HAZARDOUS AIR POLLUTANTS COMPARED TO THE MAJOR SOURCE THRESHOLDS

Hazardous Air Pollutants	PTE (T/yr)	Major Source Threshold (T/yr)	Exceeds the Major Source Threshold?
2-Methylnaphthalene	0.00000009	10	No
3-Methylchloranthrene	0.000000007	10	No
7,12-Dimethylbenz(a)Anthracene	0.00000006	10	No
Acenaphthene	0.000000007	10	No
Anthracene	0.000000009	10	No
Benzo(a)Anthracene	0.000000007	10	No
Benzene	0.000008	10	No
Benzo(a)pyrene	0.000000004	10	No
Benzo(b)fluoranthene	0.000000007	10	No
Benzo(k)fluoranthene	0.000000007	10	No
Chrysene	0.000000007	10	No
Dibnezno(a,h)anthracene	0.000000004	10	No
Dichlorobenzene	0.00000438	10	No
Fluoranthene	0.000000011	10	No
Fluorene	0.000000010	10	No
Formaldehyde	0.000275	10	No
Hexane	0.00293	10	No
Indeno(1,2,3-cd)pyrene	0.000000007	10	No
Naphthalene	0.00000223	10	No
Phenanthrene	0.00000006	10	No
Pyrene	0.000000018	10	No
Total PAHs	0.0000000286	10	No
Toluene	0.00001244	10	No
Arsenic	0.0000587	10	No
Beryllium	0.0000033	10	No
Cadmium	0.00106	10	No
Chromium (VI)	0.000202	10	No
Cobalt	0.000005	10	No
Manganese	0.0001270	10	No
Mercury	0.0000014	10	No
Nickel	0.000094	10	No
Selenium	0.000055	10	No
Total	**0.00484**	**25**	**No**

As presented in the preceding table the PTE for each HAP is less than 10 T/yr and the PTE for all HAP combined is less than 25 T/yr. Therefore, this facility is not a HAP Major Source subject to Tier I requirements.

Therefore, it needs to be determined if this facility is a criteria pollutant Major Source. As discussed previously the J.R. Simplot Co. – Conda Pumping Station facility is located in Caribou County, which is designated as unclassifiable/attainment for $PM_{2.5}$, PM_{10}, SO_2, NO_X, CO, and Ozone for federal and state criteria air pollutants. Therefore, the following table compares the post-project facility-wide annual PTE for all criteria pollutants emitted by the source to the applicable criteria pollutant Major Source thresholds in order to determine if the facility is a criteria pollutant Major Source.

Table 12 PTE FOR REGULATED AIR POLLUTANTS COMPARED TO THE MAJOR SOURCE THRESHOLDS

Regulated Air Pollutants	PTE (T/yr)	Major Source Threshold (T/yr)	Exceeds the Major Source Threshold?
PM_{10}	2.11	100	No
SO_2	2.27	100	No
NO_X	1.96	100	No
CO	0.57	100	No
VOC	0.09	100	No
CO_2e	1,717	100,000	No
F	0.31	100	No
H_2SO_4	0.02	100	No

As presented in the preceding table the PTE for each criteria pollutant is less than 100 T/yr. Therefore, this facility is not a criteria pollutant Major Source subject to Tier I requirements.

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/is not a designated facility as defined in 40 CFR 52.21(b)(1)(i)(a), and does not have facility-wide emissions of any criteria pollutant that exceed 250 T/yr.

NSPS Applicability (40 CFR 60)

Because the facility has a phosphate rock plant operation the following NSPS requirements may apply to this facility:

- 40 CFR 60, Subpart NN - Standards of Performance for Phosphate Rock Plants

40 CFR 60, Subpart NN Standards of Performance for Phosphate Rock Plants

In accordance with § 60.400(a) the provisions of this subpart are applicable to the following affected facilities used in phosphate rock plants which have a maximum plant production capacity greater than 3.6 megagrams per hour (4 tons/hr): dryers, calciners, grinders, and ground rock handling and storage facilities, except those facilities producing or preparing phosphate rock solely for consumption in elemental phosphorus production. The new proposed calciner operation has a throughput limit of 0.75 tons per hour. Therefore, the requirements of this NSPS Subpart are not applicable and no further discussion is required.

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 Applicability (40 CFR 63)

Because the facility has a phosphate rock calciner operation the following NESHAP requirements may apply to this facility:

- 40 CFR 63, Subpart AA - National Emission Standards for Hazardous Air Pollutants From Phosphoric Acid Manufacturing Plants

40 CFR 63, Subpart AA	National Emission Standards for Hazardous Air Pollutants From Phosphoric Acid Manufacturing Plants

In accordance with § 63.600(a) except as provided in paragraphs (c), (d), and (e) of this section, the requirements of this subpart apply to the owner or operator of each phosphoric acid manufacturing plant.

(b) The requirements of this subpart apply to emissions of hazardous air pollutants (HAPs) emitted from the following new or existing affected sources at a phosphoric acid manufacturing plant:

(1) Each wet-process phosphoric acid process line. The requirements of this subpart apply to the following emission points which are components of a wet-process phosphoric acid process line: reactors, filters, evaporators, and hot wells;

(2) Each evaporative cooling tower at a phosphoric acid manufacturing plant;

(3) Each phosphate rock dryer located at a phosphoric acid manufacturing plant;

(4) Each phosphate rock calciner located at a phosphoric acid manufacturing plant.

The new proposed calciner operation is not located at a phosphoric acid manufacturing plant. Therefore, the requirements of this NESHAP Subpart are not applicable and no further discussion is required.

Permit Conditions Review

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

CALCINER

Initial Permit Condition 2.1 describes the process being permitted.

Initial Permit Condition 2.2 describes the equipment being permitted and the emissions control equipment (if applicable) being employed to control emissions from each emissions unit.

Initial Permit Condition 2.3 was included to list the criteria pollutant emissions limits for the calciner as proposed by the Applicant and verified and modeled by DEQ staff.

Initial Permit Condition 2.4 establishes a 20% opacity limit for the calciner stack, vents, or functionally equivalent openings associated with the calciner.

Initial Permit Condition 2.5 establishes that the permittee shall not allow, suffer, cause, or permit the emission of odorous gasses, liquids, or solids to the atmosphere in such quantities as to cause air pollution.

Initial Permit Condition 2.6 establishes a daily throughput limit for ore processing as proposed by the Applicant. This permit condition limits the PTE for criteria pollutant emissions from the calciner operation.

Initial Permit Condition 2.7 establishes that the Permittee shall install a cyclone to control $PM_{10}/PM_{2.5}$ emissions from the calciner as proposed by the Applicant.

Initial Permit Condition 2.8 establishes that the Permittee shall install a device to measure the pressure drop across the cyclone. This condition ensures that the cyclone is operated per the manufacturer's specifications so that $PM_{10}/PM_{2.5}$ emissions from the calciner are minimized.

Initial Permit Condition 2.9 establishes that the Permittee shall maintain the pressure drop across the cyclone at the range specified by the cyclone manufacturer and listed in the O & M manual. This condition ensures that the cyclone is operated per the manufacturer's specifications so that $PM_{10}/PM_{2.5}$ emissions from the calciner are minimized.

Initial Permit Condition 2.10 establishes that the Permittee shall install a wet scrubber to control $PM_{10}/PM_{2.5}$ and SO_2 emissions from the calciner as proposed by the Applicant.

Initial Permit Condition 2.11 establishes that the Permittee shall install a device to measure the pressure drop across the wet scrubber and a device to measure the scrubbing liquid flow rate to the wet scrubber. This condition ensures that the wet scrubber is operated per the manufacturer's specifications so that $PM_{10}/PM_{2.5}$ and SO_2 emissions from the calciner are minimized.

Initial Permit Condition 2.12 establishes that the Permittee shall maintain the pressure drop across the wet scrubber and the scrubbing liquid flow rate to the wet scrubber at the ranges specified by the wet scrubber manufacturer and listed in the O & M manual. This condition ensures that the wet scrubber is operated per the manufacturer's specifications so that $PM_{10}/PM_{2.5}$ and SO_2 emissions from the calciner are minimized.

Initial Permit Condition 2.13 establishes that the calciner shall cease operation five years after issuance. This was done because the Permittee assumed short term emissions allowances for TAPs emissions compliance per IDAPA 58.01.01.215.15.

Initial Permit Condition 2.14 specifies that the Permittee shall monitor and record daily the ore processed in the calciner. In addition, monthly ore throughput is required to be calculated to determine ore throughput on a rolling 12-month basis. This requirement was included to demonstrate compliance with the Ore Throughput Limits permit condition.

Initial Permit Condition 2.15 requires that the Permittee monitor and record daily the pressure drop of the gas stream through the cyclone in inches of water. This requirement was included to demonstrate compliance with the Cyclone Operating Parameters permit condition.

Initial Permit Condition 2.16 requires that the Permittee inspect the cyclone each month. This requirement was included to ensure that cyclone is properly maintained.

Initial Permit Condition 2.17 requires that the Permittee monitor and record daily the pressure drop of the gas stream through the wet scrubber in inches of water and the scrubbing liquid flow rate to the wet scrubber in gallons per minute. This requirement was included to demonstrate compliance with the Wet Scrubber Operating Parameters permit condition.

Initial Permit Condition 2.18 specifies that records required by the permit be maintained in accordance with the Recordkeeping general provision.

MATERIALS HANDLING

Initial Permit Condition 3.1 describes the process being permitted.

Initial Permit Condition 3.2 establishes that fugitive emissions be controlled per IDAPA 58.01.01.650-651.

Initial Permit Condition 3.3 requires that the Permittee conduct an inspection of potential sources of visible fugitive emissions at the facility on a daily basis.

Initial Permit Condition 3.4 specifies that records required by the permit be maintained in accordance with the Recordkeeping general provision.

PUBLIC REVIEW

Public Comment Opportunity

An opportunity for public comment period on the application was provided in accordance with IDAPA 58.01.01.209.01.c. During this time, there were no comments on the application and there was not a request for a public comment period on DEQ's proposed action. Refer to the chronology for public comment opportunity dates.

APPENDIX A – EMISSIONS INVENTORIES

Uncontrolled Emissions Calculations:

There are two pieces of equipment employed to control PM_{10} and SO_2 emissions from the calciner, a cyclone and a wet scrubber. The Applicant states that these emissions control units have a control efficiency of 75% and 98% respectively for PM_{10} emissions and an 80% control efficiency (for the wet scrubber) for SO_2 emissions.

Using the annual PTE emissions calculations that were provided by the Applicant (see pages following) and the control efficiencies uncontrolled emissions are calculated as follows.

Uncontrolled annual PM_{10} emissions from the calciner operation are calculated as:

Uncontrolled Annual PM_{10} emissions = PM_{10} PTE (T-PM_{10}/yr) ÷ [(1 – Cyclone CE) x (1 – Wet Scrubber CE)]

Uncontrolled Annual PM_{10} emissions = 2.11 T-PM_{10}/yr ÷ [(1 – 0.75) x (1 – 0.98)] = 422.0 T-PM_{10}/yr

Uncontrolled annual SO_2 emissions from the calciner operation are calculated as:

Uncontrolled Annual PM_{10} emissions = SO_2 PTE (T- SO_2/yr) ÷ (1 – Wet Scrubber CE)

Uncontrolled Annual PM_{10} emissions = 2.27 T- SO_2/yr ÷ (1 – 0.80) = 11.35 T- SO_2/yr

Potential Emissions of NSR Pollutants from Pilot Calciner (EU- PC01)

Parameter		Value	Units	Source / Basis
Calculation Input Data:				
Maximum Short-Term Feed Rate	=	0.75	T/hr	See 'Constants' sheet.
Maximum Annual Feed Rate	=	2,800	T/yr	See 'Constants' sheet.
Cyclone PM Control Efficiency	=	75.0%	wt. %	See 'Constants' sheet.
Scrubber PM Control Efficiency	=	98.0%	wt. %	See 'Constants' sheet.
Scrubber SO2 Control Efficiency	=	80.0%	wt. %	See 'Constants' sheet.
Scrubber Fluoride Control Efficiency	=	80.0%	wt. %	See 'Constants' sheet.
Calciner PM EF	=	1.51	LB/T	Controlled; derived from pilot tests and design control efficiencies.
Calciner PM10 EF	=	1.51	LB/T	= (Calciner PM EF) x (Calciner_PM10_Fxn)
Calciner PM2.5 EF	=	0.76	LB/T	= (Calciner PM EF) x (Calciner_PM2.5_Fxn)
Calciner SO2 EF	=	1.62	LB/T	Controlled; derived from pilot tests and design control efficiencies.
Calciner NOx EF	=	1.40	LB/T	Derived from pilot tests.
Calciner CO EF	=	0.41	LB/T	Derived from pilot tests.
Calciner VOC EF	=	0.07	LB/T	Derived from pilot tests.
Calciner Lead EF	=	5.4E-06	LB/T	Controlled; derived from pilot tests and design control efficiencies.
Calciner Fluoride EF	=	0.22	LB/T	Controlled; derived from pilot tests and estimated control efficiency.
Calciner CO2e EF	=	1,226	LB/T	Derived from pilot tests.
Calciner H2SO4 EF	=	0.02	LB/T	Assumed equal to 1% of SO2 emissions.
Hourly Emissions Calculations:				
PM Emissions	=	1.13	lb/hr	= (Maximum Short-Term Feed Rate- T/hr) x (Calciner PM EF- lb/T)
PM10 Emissions	=	1.13	lb/hr	= (Maximum Short-Term Feed Rate- T/hr) x (Calciner PM10 EF- lb/T)
PM2.5 Emissions	=	0.57	lb/hr	= (Maximum Short-Term Feed Rate- T/hr) x (Calciner PM2.5 EF- lb/T)
SO2 Emissions	=	1.21	lb/hr	= (Maximum Short-Term Feed Rate- T/hr) x (Calciner SO2 EF- lb/T)
NOx Emissions	=	1.05	lb/hr	= (Maximum Short-Term Feed Rate- T/hr) x (Calciner NOx EF- lb/T)
CO Emissions	=	0.31	lb/hr	= (Maximum Short-Term Feed Rate- T/hr) x (Calciner CO EF- lb/T)
VOC Emissions	=	0.05	lb/hr	= (Maximum Short-Term Feed Rate- T/hr) x (Calciner VOC EF- lb/T)
Lead Emissions	=	0.00	lb/hr	= (Maximum Short-Term Feed Rate- T/hr) x (Calciner Lead EF- lb/T)
Fluoride Emissions	=	0.16	lb/hr	= (Maximum Short-Term Feed Rate- T/hr) x (Calciner Fluoride EF- lb/T)
CO2e Emissions	=	920	lb/hr	= (Maximum Short-Term Feed Rate- T/hr) x (Calciner CO2e EF- lb/T)
H2SO4 Emissions	=	0.01	lb/hr	= (Maximum Short-Term Feed Rate- T/hr) x (Calciner H2SO4 EF- lb/T)
Annual Emissions Calculations				
PM Emissions	=	2.11	tpy	= (Maximum Annual Feed Rate- T/yr) x (Calciner PM EF - lb/T) / (2,000 lb/T)
PM10 Emissions	=	2.11	tpy	= (Maximum Annual Feed Rate- T/yr) x (Calciner PM10 EF - lb/T) / (2,000 lb/T)
PM2.5 Emissions	=	1.06	tpy	= (Maximum Annual Feed Rate- T/yr) x (Calciner PM2.5 EF - lb/T) / (2,000 lb/T)
SO2 Emissions	=	2.27	tpy	= (Maximum Annual Feed Rate- T/yr) x (Calciner SO2 EF - lb/T) / (2,000 lb/T)
NOx Emissions	=	1.96	tpy	= (Maximum Annual Feed Rate- T/yr) x (Calciner NOx EF - lb/T) / (2,000 lb/T)
CO Emissions	=	0.57	tpy	= (Maximum Annual Feed Rate- T/yr) x (Calciner CO EF - lb/T) / (2,000 lb/T)
VOC Emissions	=	0.09	tpy	= (Maximum Annual Feed Rate- T/yr) x (Calciner VOC EF - lb/T) / (2,000 lb/T)
Lead Emissions	=	9.0E-06	tpy	= (Maximum Annual Feed Rate- T/yr) x (Calciner Lead EF - lb/T) / (2,000 lb/T)
Fluoride Emissions	=	0.3	tpy	= (Maximum Annual Feed Rate- T/yr) x (Calciner Fluoride EF - lb/T) / (2,000 lb/T)
CO2e Emissions	=	1,717	tpy	= (Maximum Annual Feed Rate- T/yr) x (Calciner CO2e EF - lb/T) / (2,000 lb/T)
H2SO4 Emissions	=	2.3E-02	tpy	= (Maximum Annual Feed Rate- T/yr) x (Calciner H2SO4 EF - lb/T) / (2,000 lb/T)

Summary of Results: Pilot Calciner Potential Emissions (tons per year)

Pollutant	=	PM	PM10	PM2.5	SO2	NOx	CO	VOC	Pb	Fluoride	CO2e	H2SO4
Shrot-Term Rate (lb/hr)	=	1.13	1.13	0.57	1.21	1.05	0.3075	0.05025	4.8E-06	0.16	920	0.01
Annual Rate (TPY)	=	2.11	2.11	1.06	2.27	1.96	0.57	0.09	0.00	0.31	1716.89	0.02

Calciner PTE TAP & HAP

Pollutant	Natural Gas EF	NG EF Units	NG EF Source	Production-Based Natural Gas EF (lb/T)	Uncontrolled Pilot Test EF (lb/T)	Maximum EF (lb/T)	Particulate or Gaseous ‡	Short-Term Calciner PTE (lb/hr) †	Annual Avg Calciner PTE (lb/hr)	Calciner PTE (T/yr)
2-Methylnaphthalene*	2.40E-05	(lb/MMSCF)	AP42; Table 1.4-3; 7/98.	6.27E-08		6.27E-08	G	4.71E-08	2.01E-08	8.78E-08
3-Methylchloranthrene*	<1.8E-06	(lb/MMSCF)	AP42; Table 1.4-3; 7/98.	<4.71E-09		<4.71E-09	G	<3.53E-09	<1.50E-09	<6.59E-09
7,12-Dimethylbenz(a)anthracene*	<1.6E-05	(lb/MMSCF)	AP42; Table 1.4-3; 7/98.	<4.18E-08		<4.18E-08	G	<3.14E-08	<1.34E-08	<5.86E-08
Acenaphthene*	<1.8E-06	(lb/MMSCF)	AP42; Table 1.4-3; 7/98.	<4.71E-09		<4.71E-09	G	<3.53E-09	<1.50E-09	<6.59E-09
Anthracene*	<2.4E-06	(lb/MMSCF)	AP42; Table 1.4-3; 7/98.	<6.27E-09		<6.27E-09	G	<4.71E-09	<2.01E-09	<8.78E-09
Benzo(a)anthracene	<1.8E-06	(lb/MMSCF)	AP42; Table 1.4-3; 7/98.	<4.71E-09		<4.71E-09	G	<3.53E-09	<1.50E-09	<6.59E-09
Benzene*	2.10E-03	(lb/MMSCF)	AP42; Table 1.4-3; 7/98.	5.49E-06		5.49E-06	G	4.12E-06	1.75E-06	7.69E-06
Benzo(a)pyrene*	<1.2E-06	(lb/MMSCF)	AP42; Table 1.4-3; 7/98.	<3.14E-09		<3.14E-09	G	<2.35E-09	<1.00E-09	<4.39E-09
Benzo(b)fluoranthene	<1.8E-06	(lb/MMSCF)	AP42; Table 1.4-3; 7/98.	<4.71E-09		<4.71E-09	G	<3.53E-09	<1.50E-09	<6.59E-09
Benzo(g,h,I)perylene*	<1.2E-06	(lb/MMSCF)	AP42; Table 1.4-3; 7/98.	<3.14E-09		<3.14E-09	G	<2.35E-09	<1.00E-09	<4.39E-09
Benzo(k)fluoranthene	<1.8E-06	(lb/MMSCF)	AP42; Table 1.4-3; 7/98.	<4.71E-09		<4.71E-09	G	<3.53E-09	<1.50E-09	<6.59E-09
Chrysene	<1.8E-06	(lb/MMSCF)	AP42; Table 1.4-3; 7/98.	<4.71E-09		<4.71E-09	G	<3.53E-09	<1.50E-09	<6.59E-09
Dibenzo(a,h)anthracene	<1.2E-06	(lb/MMSCF)	AP42; Table 1.4-3; 7/98.	<3.14E-09		<3.14E-09	G	<2.35E-09	<1.00E-09	<4.39E-09
Dichlorobenzene	1.20E-03	(lb/MMSCF)	AP42; Table 1.4-3; 7/98.	3.14E-06		3.14E-06	G	2.35E-06	1.00E-06	4.39E-06
Fluoranthene*	3.00E-06	(lb/MMSCF)	AP42; Table 1.4-3; 7/98.	7.84E-09		7.84E-09	G	5.88E-09	2.51E-09	1.10E-08
Fluoride					1.09E+00	1.09E+00		1.64E-01	6.97E-02	3.05E-01
Fluorene	2.80E-06	(lb/MMSCF)	AP42; Table 1.4-3; 7/98.	7.32E-09		7.32E-09	G	5.49E-09	2.34E-09	1.02E-08
Formaldehyde*	7.50E-02	(lb/MMSCF)	AP42; Table 1.4-3; 7/98.	1.96E-04		1.96E-04	G	1.47E-04	6.27E-05	2.75E-04
Hexane	1.80E+00	(lb/MMSCF)	AP42; Table 1.4-3; 7/98.	2.09E-03		2.09E-03	G	1.57E-03	6.69E-04	2.93E-03
Indeno(1,2,3-cd)pyrene	<1.8E-06	(lb/MMSCF)	AP42; Table 1.4-3; 7/98.	<4.71E-09		<4.71E-09	G	<3.53E-09	<1.50E-09	<6.59E-09
N2O	2.20E+00	(lb/MMSCF)	AP42; Table 1.4-2; 7/98.	5.23E-04		5.23E-04	G	3.92E-04	1.67E-04	7.32E-04
Naphthalene	6.10E-04	(lb/MMSCF)	AP42; Table 1.4-3; 7/98.	1.59E-06		1.59E-06	G	1.20E-06	5.10E-07	2.23E-06
Phenanthrene*	1.70E-05	(lb/MMSCF)	AP42; Table 1.4-3; 7/98.	4.44E-08		4.44E-08	G	3.33E-08	1.42E-08	6.22E-08
Pyrene*	5.00E-06	(lb/MMSCF)	AP42; Table 1.4-3; 7/98.	1.31E-08		1.31E-08	G	9.80E-09	4.18E-09	1.83E-08
TOTAL PAH*	<7.80E-06	(lb/MMSCF)	Sum of 7-PAH EFs from AP42.	<2.04E-08		<2.04E-08	G	<1.53E-08	<6.52E-09	<2.85E-08
Toluene	3.40E-03	(lb/MMSCF)	AP42; Table 1.4-3; 7/98.	8.89E-06		8.89E-06	G	6.67E-06	2.84E-06	1.24E-05
Arsenic*	2.00E-04	(lb/MMSCF)	AP42; Table 1.4-4; 7/98.	5.23E-07	8.37E-03	8.37E-03	P	3.14E-05	1.34E-05	5.86E-05
Barium	4.40E-03	(lb/MMSCF)	AP42; Table 1.4-4; 7/98.	1.15E-05		1.15E-05	P	4.31E-08	1.84E-08	8.05E-08
Beryllium*	<1.2E-05	(lb/MMSCF)	AP42; Table 1.4-4; 7/98.	<3.14E-08	4.72E-04	4.72E-04	P	1.77E-06	7.54E-07	3.30E-06
Cadmium*	1.10E-03	(lb/MMSCF)	AP42; Table 1.4-4; 7/98.	2.88E-06	1.51E-01	1.51E-01	P	5.66E-04	2.41E-04	1.06E-03
Chromium (VI)*					2.88E-02	2.88E-02	P	1.08E-04	4.61E-05	2.02E-04
Cobalt	8.40E-05	(lb/MMSCF)	AP42; Table 1.4-4; 7/98.	2.20E-07	7.20E-04	7.20E-04	P	2.70E-06	1.15E-06	5.04E-06
Copper	8.50E-04	(lb/MMSCF)	AP42; Table 1.4-4; 7/98.	2.22E-06		2.22E-06	P	8.33E-09	3.55E-09	1.56E-08
Manganese	3.80E-04	(lb/MMSCF)	AP42; Table 1.4-4; 7/98.	9.93E-07	1.81E-02	1.81E-02	P	6.80E-05	2.90E-05	1.27E-04
Mercury	2.60E-04	(lb/MMSCF)	AP42; Table 1.4-4; 7/93.	6.80E-07	2.03E-04	2.03E-04	P	7.62E-07	3.25E-07	1.42E-06
Molybdenum	1.10E-03	(lb/MMSCF)	AP42; Table 1.4-4; 7/98.	2.88E-06		2.88E-06	P	1.08E-08	4.60E-09	2.01E-08
Nickel*	2.10E-03	(lb/MMSCF)	AP42; Table 1.4-4; 7/98.	5.49E-06	1.34E-02	1.34E-02	P	5.01E-05	2.14E-05	9.35E-05
Sulfuric Acid	9.19E-03	(lb/MMSCF)	1% of SO2 (AP42; Table 1.4-2.)	2.40E-05		2.40E-05	P	9.01E-08	3.84E-08	1.68E-07
Selenium	<2.4E-05	(lb/MMSCF)	AP42; Table 1.4-4; 7/98.	<6.27E-08	7.89E-03	7.89E-03	P	2.96E-05	1.26E-05	5.52E-05
Vanadium	2.30E-03	(lb/MMSCF)	AP42; Table 1.4-4; 7/98.	6.01E-06		6.01E-06	P	2.25E-08	9.61E-09	4.21E-08
Zinc	2.90E-02	(lb/MMSCF)	AP42; Table 1.4-4; 7/98.	7.58E-05	5.16E-01	5.16E-01	P	1.93E-03	8.24E-04	3.61E-03

* EIs and AACs adjusted upward by a factor of 10 pursuant to the provisions of IDAPA 58.01.01, Section 210.15

† See 'Calciner PTE NSR Pollutants' for basis for fluoride emissions estiamtes.

‡ As a conservative assumption, it is assumed that those TAPs indicated with a "G" are not controlled by either the cyclone or the scrubber. PTE values are controlled rates. See 'Constants' sheet for design control efficiencies.

PM Emissions due to Haul Roads		
Parameter	Value Units	Source / Basis
Annual Processing Rate =	2,800 T/yr	Requested Permit Limit
Daily Processing Rate =	18.0 T/day	Based on maximum hourly rate, 24-hr/day.
Round Trip Distance =	1.2 miles	Estimtate: travel distance from property line to location of pilot unit.
Truck Type =	10T Dump	10 ton capacity dump truck.
Empty Vehicle Weight =	26,000 lb	Typical 10 Ton truck empty weight.
Empty Vehicle Weight =	13.0 tons	= (Empty Vehicle Weight) / (2000 lb/T)
Full Vehicle Weight =	23.0 tons	= Empty weight + 10 tons.
Mean Vehicle Weight (W) =	18.0 tons	= (Empty Vehicle Weight + Full Vehicle Weight) / 2
Daily Round Trips =	2.0 trips/day	
Truck miles per day =	2.4 VMT/day	= (Daily Round Trips) x (Round Trip Distance)
Unpaved Road Silt Fraction (s) =	4.8 wt. %	AP-42; Table 13.2.2-1 (Mean for Sand & Gravel Processing - Plant Road); 11/06.
Unpaved PM particle size factor (k) =	4.90 lb/VMT	AP-42; Table 13.2.2-2; 11/06.
Unpaved PM10 particle size factor (k) =	1.50 lb/VMT	AP-42; Table 13.2.2-2; 11/06.
Unpaved PM2.5 particle size factor (k) =	0.15 lb/VMT	AP-42; Table 13.2.2-2; 11/06.
Unpaved TSP "a" constant =	0.70 lb/VMT	AP-42; Table 13.2.2-2; 11/06.
Unpaved PM10 "a" constant =	0.90 lb/VMT	AP-42; Table 13.2.2-2; 11/06.
Unpaved PM2.5 "a" constant =	0.90 lb/VMT	AP-42; Table 13.2.2-2; 11/06.
Unpaved TSP "b" constant =	0.45 lb/VMT	AP-42; Table 13.2.2-2; 11/06.
Unpaved PM10 "b" constant =	0.45 lb/VMT	AP-42; Table 13.2.2-2; 11/06.
Unpaved PM2.5 "b" constant =	0.45 lb/VMT	AP-42; Table 13.2.2-2; 11/06.
Days with > 0.01" of precipitation (P) =	100.0 days/yr	AP-42, Figure 13.2.1-2; 1/11.
Days in Period =	365.0 days/yr	Used for calculation of annual rates.
Daily Uncontrolled PM Emissions Factor =	5.78 lb/VMT	$E = k\,(s/12)^a (W/3)^b$ (1a)
Daily Uncontrolled PM10 Emissions Factor =	1.47 lb/VMT	
Daily Uncontrolled PM2.5 Emissions Factor =	0.15 lb/VMT	
Annual Uncontrolled PM Emissions Factor =	4.20 lb/VMT	$E_{ext} = E\,[(365 - P)/365]$ (2)
Annual Uncontrolled PM10 Emissions Factor =	1.07 lb/VMT	
Annual Uncontrolled PM2.5 Emissions Factor =	0.11 lb/VMT	
Daily PM Emissions =	13.9 lb/day	= (Daily Uncontrolled PM Emissions Factor) x (Truck miles per day)
Daily PM10 Emissions =	3.53 lb/day	= (Daily Uncontrolled PM10 Emissions Factor) x (Truck miles per day)
Daily PM2.5 Emissions =	0.35 lb/day	= (Daily Uncontrolled PM2.5 Emissions Factor) x (Truck miles per day)
Annual PM Emissions =	0.78 tons/yr	= (Annual Uncontrolled PM Emissions Factor) x (Truck miles per day) x (Annual Processing Rate) / (Daily Processing Rate) / (2,000 lb/T)
Annual PM10 Emissions =	0.20 tons/yr	= (Annual Uncontrolled PM10 Emissions Factor) x (Truck miles per day) x (Annual Processing Rate) / (Daily Processing Rate) / (2,000 lb/T)
Annual PM2.5 Emissions =	0.02 tons/yr	= (Annual Uncontrolled PM2.5 Emissions Factor) x (Truck miles per day) x (Annual Processing Rate) / (Daily Processing Rate) / (2,000 lb/T)

PM Emissions due to Wind Erosion from Raw Rock Storage Piles			
Parameter	Value	Units	Source / Basis
Storage Pile Mass =	9	tons	Mass to be stored in each pile.
Storage Pile Volume =	138.5	ft3	Estimate (9 tons per pile, bulk density = 130 lb/ft3)
Storage Pile Angle of Repose =	37	°	Estimate
Storage Pile Radius =	4.73	ft	Calculated
Storage Pile Height =	5.92	ft	Calculated
No. of Storage Piles =	2	piles	
Storage Pile Area =	175.8	ft2	= (Surface area of conical pile) x (Number of storage piles)
Storage Pile Area =	0.004	acre	= (Storage Pile Area) / (43,560 ft2/acre)
Annual Pile Days =	233	days/yr	Annual receiving rate / daily reclaim rate.
Silt Content (s) =	50	wt. %	Worst-case estimate.
Threshold Wind Speed (f) =	20	% of time	From Soda Springs met data (% of time > 5.4 m/s @ 10m elevation).
Days with > 0.01" of precipitation (p) =	100	days/yr	AP-42; Figure 13.2.1-2; 1/11.
PM Particle Size Multiplier =	1		Air Pollution Engineering Manual; p 136; AWMA; 1992.
PM-10 Particle Size Multiplier =	0.5		Air Pollution Engineering Manual; p 136; AWMA; 1992.
PM-2.5 Particle Size Multiplier =	0.2		Air Pollution Engineering Manual; p 136; AWMA; 1992.
PM Emissions Factor =	85.2	lb/day/acre	Air Pollution Engineering Manual; p 136; Eqn. 5 (active storage piles); AWMA; 1992.
PM-10 Emissions Factor =	42.6	lb/day/acre	Air Pollution Engineering Manual; p 136; Eqn. 5 (active storage piles); AWMA; 1992.
PM-2.5 Emissions Factor =	17.0	lb/day/acre	Air Pollution Engineering Manual; p 136; Eqn. 5 (active storage piles); AWMA; 1992.
PM Emissions (24-hr avg basis) =	0.0143	lb/hr	= (Storage Pile Area) x (PM Emissions Factor) / (24 hr/day)
PM-10 Emissions (24-hr avg basis) =	0.0072	lb/hr	= (Storage Pile Area) x (PM-10 Emissions Factor) / (24 hr/day)
PM-2.5 Emissions (24-hr avg basis) =	0.0029	lb/hr	= (Storage Pile Area) x (PM-2.5 Emissions Factor) / (24 hr/day)
Annual PM Emissions =	0.0401	tpy	= (Storage Pile Area) x (Annual Pile Days) x (PM Emissions Factor) / (2000 lb/ton)
Annual PM-10 Emissions =	0.0201	tpy	= (Storage Pile Area) x (Annual Pile Days) x (PM-10 Emissions Factor) / (2000 lb/ton)
Annual PM-2.5 Emissions =	0.0080	tpy	= (Storage Pile Area) x (Annual Pile Days) x (PM-2.5 Emissions Factor) / (2000 lb/ton)

PM Emissions due to Wind Erosion from Product Cooling Pad		
Parameter	Value Units	Source / Basis
Volume of Product on Cooling Pad =	369 ft3	Estimate = two days' worth of product)
Thickness of Material =	0.5 ft	Estimate
Cooling Pad Area =	738 ft2	Surface area of conical pile.
Cooling Pad Area =	0.02 acre	= (Cooling Pad Area - ft2) / (43,560 ft2/acre)
Annual Pile Days =	233 days/yr	Annual receiving rate / daily reclaim rate
Silt Content (s) =	50 wt. %	Worst-case estimate.
Threshold Wind Speed (f) =	20 % of time	From Soda Springs met data (% of time > 5.4 m/s @ 10m elevation).
Days with > 0.01" of precipitation (p) =	100 days/yr	AP-42; Figure 13.2.1-2; 1/11.
PM Particle Size Multiplier =	1	Air Pollution Engineering Manual; p 136; AWMA; 1992.
PM-10 Particle Size Multiplier =	0.5	Air Pollution Engineering Manual; p 136; AWMA; 1992.
PM-2.5 Particle Size Multiplier =	0.2	Air Pollution Engineering Manual; p 136; AWMA; 1992.
PM Emissions Factor =	85.2 lb/day/acre	Air Pollution Engineering Manual; p 136; Eqn. 5 (active storage piles); AWMA; 1992.
PM-10 Emissions Factor =	42.6 lb/day/acre	Air Pollution Engineering Manual; p 136; Eqn. 5 (active storage piles); AWMA; 1992.
PM-2.5 Emissions Factor =	17.0 lb/day/acre	Air Pollution Engineering Manual; p 136; Eqn. 5 (active storage piles); AWMA; 1992.
PM Emissions (24-hr avg basis) =	0.0602 lb/hr	= (Cooling Pad Area) x (PM Emissions Factor) / (24 hr/day)
PM-10 Emissions (24-hr avg basis) =	0.0301 lb/hr	= (Cooling Pad Area) x (PM-10 Emissions Factor) / (24 hr/day)
PM-2.5 Emissions (24-hr avg basis) =	0.0120 lb/hr	= (Cooling Pad Area) x (PM-2.5 Emissions Factor) / (24 hr/day)
Annual PM Emissions =	0.1685 tpy	= (Cooling Pad Area) x (Annual Pile Days) x (PM Emissions Factor) / (2000 lb/ton)
Annual PM-10 Emissions =	0.0843 tpy	= (Cooling Pad Area) x (Annual Pile Days) x (PM-10 Emissions Factor) / (2000 lb/ton)
Annual PM-2.5 Emissions =	0.0337 tpy	= (Cooling Pad Area) x (Annual Pile Days) x (PM-2.5 Emissions Factor) / (2000 lb/ton)

PM Emissions due to Raw Rock Transfer Points		
Parameter	Value Units	Source / Basis
Mean Wind Speed [U] =	8.4 mph	Approximate monthly average wind speed @ Soda Springs.
PM Particle Size Multiplier [k] =	0.7	AP-42, Sec. 13.2.4, p. 13.2.4-4; 1/95.
PM10 Particle Size Multiplier [k] =	0.4	AP-42, Sec. 13.2.4, p. 13.2.4-4; 1/95.
PM2.5 Particle Size Multiplier [k] =	0.1	AP-42, Sec. 13.2.4, p. 13.2.4-4; 1/95.
Material Moisture Content [M] =	10.0 wt. %	Unprocessed Rock.
Number of Xfer Points =	2	Unloading to storage pile and Loading to feed hopper.
Applied Control Efficiency =	0.0 wt. %	No control assumed.
PM Emissions Factor =	4.9E-04 lb/ton	AP-42, Sec. 13.2.4, Eqn 1, p. 13.2.4-4;11/06.
PM-10 Emissions Factor =	2.3E-04 lb/ton	AP-42, Sec. 13.2.4, Eqn 1, p. 13.2.4-4;11/06.
PM-2.5 Emissions Factor =	3.5E-05 lb/ton	AP-42, Sec. 13.2.4, Eqn 1, p. 13.2.4-4;11/06.
Hourly Processing Rate =	25.0 ton/hr	Estimated unloading rate.
Annual Processing Rate =	2800.0 ton/yr	Maximum planned annual processing rate.
PM Hourly Emissions =	2.4E-02 lb/hr	= (Number of Xfer Points) x (Hourly Processing Rate) x (PM Emissions Factor)
PM-10 Hourly Emissions =	1.2E-02 lb/hr	= (Number of Xfer Points) x (Hourly Processing Rate) x (PM-10 Emissions Factor)
PM-2.5 Hourly Emissions =	1.7E-03 lb/hr	= (Number of Xfer Points) x (Hourly Processing Rate) x (PM-2.5 Emissions Factor)
PM Annual Emissions =	1.4E-03 ton/yr	= (Number of Xfer Points) x (Annual Processing Rate) x (PM Emissions Factor) / (2000 lb/ton)
PM-10 Annual Emissions =	6.5E-04 ton/yr	= (Number of Xfer Points) x (Annual Processing Rate) x (PM-10 Emissions Factor) / (2000 lb/ton)
PM-2.5 Annual Emissions =	9.8E-05 ton/yr	= (Number of Xfer Points) x (Annual Processing Rate) x (PM-2.5 Emissions Factor) / (2000 lb/ton)

PM Emissions due to Calciner Product Transfer Points		
Parameter	Value Units	Source / Basis
Mean Wind Speed [U] =	8.4 mph	Approximate monthly average wind speed @ Soda Springs.
PM Particle Size Multiplier [k] =	0.7	AP-42, Sec. 13.2.4, p. 13.2.4-4; 1/95.
PM10 Particle Size Multiplier [k] =	0.4	AP-42, Sec. 13.2.4, p. 13.2.4-4; 1/95.
PM2.5 Particle Size Multiplier [k] =	0.1	AP-42, Sec. 13.2.4, p. 13.2.4-4; 1/95.
Material Moisture Content [M] =	2.0 wt. %	Processed Rock.
Number of Xfer Points [N] =	2.0	From kiln to stockpile & from stockpile to trucks.
Applied Control Efficiency =	0.0 wt. %	No control assumed.
PM Emissions Factor =	4.6E-03 lb/ton	AP-42, Sec. 13.2.4, Eqn 1, p. 13.2.4-4;11/06.
PM-10 Emissions Factor =	2.2E-03 lb/ton	AP-42, Sec. 13.2.4, Eqn 1, p. 13.2.4-4;11/06.
PM-2.5 Emissions Factor =	3.3E-04 lb/ton	AP-42, Sec. 13.2.4, Eqn 1, p. 13.2.4-4;11/06.
Hourly Processing Rate =	25.0 ton/hr	Estimated unloading rate.
Annual Processing Rate =	2800.0 ton/yr	Maximum planned annual processing rate.
PM Hourly Emissions =	0.23 lb/hr	= (Number of Xfer Points [N]) x (Hourly Processing Rate) x (PM Emissions Factor)
PM-10 Hourly Emissions =	0.11 lb/hr	= (Number of Xfer Points [N]) x (Hourly Processing Rate) x (PM-10 Emissions Factor)
PM-2.5 Hourly Emissions =	0.02 lb/hr	= (Number of Xfer Points [N]) x (Hourly Processing Rate) x (PM-2.5 Emissions Factor)
PM Annual Emissions =	0.01 ton/yr	= (Number of Xfer Points [N]) x (Annual Processing Rate) x (PM Emissions Factor) / (2000 lb/ton)
PM-10 Annual Emissions =	0.01 ton/yr	= (Number of Xfer Points [N]) x (Annual Processing Rate) x (PM-10 Emissions Factor) / (2000 lb/ton)
PM-2.5 Annual Emissions =	0.00 ton/yr	= (Number of Xfer Points [N]) x (Annual Processing Rate) x (PM-2.5 Emissions Factor) / (2000 lb/ton)

Constants

Constant	Value	Units	Basis
Max Hourly Rate =	1,500	lb/hr	Proposed permit limit.
Max Daily Hours =	24	hr/day	
Max Annual Rate =	2,800	T/yr	Proposed permit limit.
Rock Bulk Density =	130	lb/ft3	
Mean number of days with 0.01 inch or more of precipitation =	100	days/yr	
Soda Springs Threshold Wind Speed Fraction =	20	% of time	From Soda Springs met data (% of time > 5.4 m/s @ 10m elevation).
Soda Springs Mean Wind Speed =	8.4	mph	
SCF per lb-mole =	385.6	SCF/lbmol	SCF @ 68 °F.
micrograms per milligram =	1,000	ug/mg	
PM10 Fraction of Controlled Emissions =	100.0%	wt. %	See 'Calciner Stack PSD data' sheet.
PM2.5 Fraction of Controlled Emissions =	50.4%	wt. %	See 'Calciner Stack PSD data' sheet; linear interpolation.
Feet per Meter =	3.2808	ft/m	
Natural Gas Higher Heating Value =	1,020	Btu/SCF	AP-42, C1, S4.
Calciner Burner Maximum Heat Input =	2.0	MMBtu/hr	Vendor data.
Calciner Stack Modeled Impact (24-hr) =	49.3680	ug/m3/lb/hr	See Section 4 and Appendix D of Application.
Calciner Stack Modeled Impact (Annual) =	15.4067	ug/m3/lb/hr	See Section 4 and Appendix D of Application.
Cyclone PM Control Efficiency =	75.0%	wt. %	Design Basis
Scrubber PM Control Efficiency =	98.0%	wt. %	Design Basis
Scrubber SO2 Control Efficiency =	80.0%	wt. %	Design Basis
Scrubber Fluoride Control Efficiency =	80.0%	wt. %	Conservative estimate - see "Emission Factor Documentation for AP-42 Section 11.21", p. 20.
Short-Term TAP Adjustment Factor =	10		IDAPA Section 210.15.

Test-Based Emissions Factors

Basis for Pilot Kiln Emission Factors		
Feed Rate to Test Kiln =	200 lb/hr	
Raw Test Results		Test EF (uncontrolled)
Compound	lb/hr	lb/ton
Antimony	4.46E-05	4.46E-04
Arsenic	8.37E-04	8.37E-03
Beryllium	4.72E-05	4.72E-04
Cadmium	1.51E-02	1.51E-01
Chromium	9.49E-03	9.49E-02
Chromium (VI)	2.88E-03	2.88E-02
Cobalt	7.20E-05	7.20E-04
Manganese	1.81E-03	1.81E-02
Mercury	2.03E-05	2.03E-04
Nickel	1.34E-03	1.34E-02
Selenium	7.89E-04	7.89E-03
Zinc	5.16E-02	5.16E-01
Fluoride	1.09E-01	1.09E+00
Carbon Monoxide	4.10E-02	4.10E-01
Sulfur Dioxide	8.09E-01	8.09E+00
Nitrogen Oxides	1.40E-01	1.40E+00
Total VOCs	6.70E-03	6.70E-02
GHGs	1.23E+02	1.23E+03
Phosphate	9.30E-04	9.30E-03
PM	3.01E+01	3.01E+02
Lead	1.28E-04	1.28E-03

NOTE:

Virtually none of the Cr in the raw rock is Cr VI; However, as a conservative estimate, the Cr VI content of the total Cr emissions from the Calciner is assumed equal to 30% of total Cr emissions based on the Cr VI-to-Cr ratio in AP-42, C01S01.

The particle size data for the final exhaust stack is summarized in the following table:

Test Location	Filter "Cut" Size, Microns	Percent, by weight, less than the cut size
Final Stack	0.35	0 %
	0.87	9.1 %
	1.72	36.4 %
	2.73	54.5 %
	5.92	81.8 %
	9.45	100 %

Linear Interpolation	
Size (µm)	wt. %
2.5	50%

APPENDIX B – AMBIENT AIR QUALITY IMPACT ANALYSES

MEMORANDUM

DATE: August 19, 2013

TO: Darrin Pampaian, Permit Writer, Air Program

FROM: Kevin Schilling, Stationary Source Modeling Coordinator, Air Program

PROJECT: P-2013.0037 PROJ61225 PTC Application for the J.R. Simplot Company, Permit to Construct for a Pilot Plant Calciner

SUBJECT: Demonstration of Compliance with IDAPA 58.01.01.203.02 (NAAQS) and 203.03 (TAPs)

1.0 Summary

J.R. Simplot Company (Simplot) submitted a Permit to Construct (PTC) application for a Pilot Plant Calciner, located at Simplot's Conda Pumping Station in Conda, Idaho. Project-specific air quality impact analyses involving atmospheric dispersion modeling of estimated emissions associated with the proposed project were submitted to DEQ to demonstrate that the proposed plant would not cause or significantly contribute to a violation of any ambient air quality standard (IDAPA 58.01.01.203.02 and 203.03 [Idaho Air Rules Section 203.02 and 203.03]). RTP Environmental Consultants, Inc. (RTP), Simplot's permitting consultant, submitted the analyses and applicable information and data enabling DEQ to evaluate potential impacts to ambient air.

RTP performed project-specific air quality impact analyses to demonstrate compliance of the proposed project with air quality standards. The DEQ review summarized by this memorandum addressed only the rules, policies, methods, and data pertaining to the pollutant dispersion modeling analyses used to demonstrate that the estimated emissions associated with operation of the proposed facility or modification will not cause or significantly contribute to a violation of any applicable air quality standard. This review did not evaluate compliance with other rules or analyses that do not pertain to the air impact analyses. This modeling review also did not evaluate the accuracy of emissions estimates. Evaluation of emissions estimates was the responsibility of the permit writer and is addressed in the main body of the DEQ Statement of Basis.

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

Table 1. KEY CONDITIONS USED IN MODELING ANALYSES	
Criteria/Assumption/Result	**Explanation/Consideration**
The project operational life will be less than five years.	The impact analyses assumed the project was short term, and the short term adjustment factor of 10 was applied to the applicable AACCs to enable TAP compliance.
Emissions rates used in the modeling analyses, as listed in this memorandum, represent maximum potential emissions as given by design capacity or as limited by the issued permit for the specific pollutant and averaging period.	Compliance has not been demonstrated for emissions rates greater than those used in the modeling analyses.

The proposed project involves the following: 1) an open receiving/raw rock storage pile; 2) a raw rock feed hopper and feed screw conveyor; 3) a small scale calciner with a cyclone and wet scrubber; 4) an open product storage bin.

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

2.0 Background Information

2.1 Applicable Air Quality Impact Limits and Modeling Requirements

This section identifies applicable ambient air quality standards and analyses used to demonstrate compliance with air quality standards.

2.1.1 Area Classification

The proposed calciner project is a proposed modification to the existing Conda Pumping Station stationary facility. The facility is located in Conda, Idaho, in northern Caribou County. The area is designated as attainment or unclassifiable for all pollutants.

2.1.2 Modeling Applicability for Criteria Pollutants

Idaho Air Rules Section 203.02 state that a PTC cannot be issued unless the application demonstrates to the satisfaction of DEQ that the new source or modification will not cause or significantly contribute to a NAAQS violation. Atmospheric dispersion modeling is used to evaluate the potential impact of a proposed project to ambient air and demonstrate NAAQS compliance. However, if the emissions associated with a project are very small, project-specific modeling analyses may not be necessary.

If the emissions increase associated with a project are below modeling applicability thresholds established in the *Idaho Air Modeling Guideline* ("State of Idaho Guideline for Performing Air Quality Impact Analyses," available at http://www.deq.idaho.gov/media/355037-modeling-guideline.pdf), then a project-

specific analysis is not required. Modeling applicability emissions thresholds were developed by DEQ based on modeling of a hypothetical source designed to reasonably assure that impacts are below the applicable Significant Impact Level (SIL). DEQ has established two threshold levels: Level 1 thresholds are unconditional thresholds, requiring no approval for use by DEQ; Level 2 thresholds are conditional upon DEQ approval, which depends on evaluation of the project and the site, including emissions quantities, stack parameters, number of sources emissions are distributed amongst, distance between the sources and the ambient air boundary, and the presence of sensitive receptors near the ambient air boundary.

Section 3.2.1 provides results of the modeling applicability analysis.

2.1.3 Significant and Cumulative NAAQS Impact Analyses

If modeled maximum pollutant impacts to ambient air from the emissions sources associated with a new facility or the emissions increase associated with a modification exceed the significant impact levels (SILs) of 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, 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 may also be required for permit revisions driven by compliance/enforcement actions, any correction of emissions limits or other operational parameters that may affect pollutant impacts to ambient air, or other cases where DEQ believes NAAQS may be threatened by the emissions associated with the proposed project.

The SIL analyses for a facility modification involves modeling the increase in allowable or potential emissions that results from the proposed modification. Any decreases in emissions are modeled as negative values to account for the reduction in impacts to ambient air.

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

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

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

violations, the impact of proposed facility/modification to any modeled violation was inconsequential (typically assumed to be less than the established SIL) for that specific receptor and for the specific modeled time when the violation occurred.

Table 2. APPLICABLE REGULATORY LIMITS

Pollutant	Averaging Period	Significant Impact Levels[a] ($\mu g/m^3$)[b]	Regulatory Limit[c] ($\mu g/m^3$)	Modeled Design Value Used[d]
PM_{10}[e]	24-hour	5.0	150[f]	Maximum 6th highest[g]
$PM_{2.5}$[h]	24-hour	1.2	35[i]	Mean of maximum 8th highest[j]
	Annual	0.3	15[k]	Mean of maximum 1st highest[l]
Carbon monoxide (CO)	1-hour	2,000	40,000[m]	Maximum 2nd highest
	8-hour	500	10,000[m]	Maximum 2nd highest
Sulfur Dioxide (SO_2)	1-hour	3 ppb[n] (7.8 $\mu g/m^3$)	75 ppb[o] (196 $\mu g/m^3$)	Mean of maximum 4th highest[p]
	3-hour	25	1,300[m]	Maximum 2nd highest
	24-hour	5	365[m]	Maximum 2nd highest
	Annual	1.0	80[q]	Maximum 1st highest
Nitrogen Dioxide (NO_2)	1-hour	4 ppb[n] (7.5 $\mu g/m^3$)	100 ppb[r] (188 $\mu g/m^3$)	Mean of maximum 8th highest[s]
	Annual	1.0	100[q]	Maximum 1st highest
Lead (Pb)	3-month[t]	NA	0.15[q]	Maximum 1st highest
	Quarterly	NA	1.5[q]	Maximum 1st highest

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 average 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.
k. 3-year average of annual concentration. The NAAQS was revised to 12 $\mu g/m^3$ on December 14, 2012. However, this standard will not be applicable for permitting purposes in Idaho until it is incorporated by reference *sine die* into Idaho Air Rules (Spring 2014).
l. 5-year mean of annual averages.
m. Not to be exceeded more than once per year.
n. Interim SIL established by EPA policy memorandum.
o. 3-year average of the upper 99th percentile of the annual distribution of maximum daily 1-hour concentrations.
p. 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 average of maximum modeled 1-hour impacts for each year is used.
q. Not to be exceeded in any calendar year.
r. 3-year average of the upper 98th percentile of the annual distribution of maximum daily 1-hour concentrations.
s. 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 average of maximum modeled 1-hour impacts for each year is used.
t. 3-month rolling average.

NO_2 and SO_2 short-term standards have recently been promulgated by EPA. The standards became applicable for permitting purposes in Idaho when they were incorporated by reference *sine die* into Idaho Air Rules (Spring 2011).

The $PM_{2.5}$ annual standard was changed from 15 $\mu g/m^3$ to 12 $\mu g/m^3$ on December 14, 2012. The revised standard will not become applicable for permitting purposes until it is incorporated *sine die* into Idaho Air Rules (Spring 2014).

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

Idaho Air Rules Section 210.15 provides for a short-term emissions source adjustment factor for projects having an operational life of no greater than five years. The adjustment factor of 10 is applied to carcinogenic TAP ELs or AACCs.

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.

2.2 Background Concentrations

Background concentrations are used in the cumulative NAAQS impact analyses to account for impacts from sources not explicitly modeled. Project-specific modeling analyses were not needed for criteria pollutants because emissions increases associated with the proposed project were below established DEQ modeling applicability thresholds. Section 3.2.1 describes the modeling applicability analyses.

3.0 Modeling Impact Assessment

3.1 Modeling Methodology

This section describes the modeling methods used by the applicant's consultant, RTP, to demonstrate preconstruction compliance with applicable air quality standards.

3.1.1 Overview of Analyses

RTP performed project-specific air impact analyses that were determined by DEQ to be reasonably representative of the proposed pilot plant project. Results of the submitted analyses demonstrated 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 3 provides a brief description of parameters used in the modeling analyses.

Table 3. MODELING PARAMETERS

Parameter	Description/Values	Documentation/Addition Description
General Facility Location	Conda	The area is an attainment or unclassified area for all criteria pollutants.
Model	AERMOD	AERMOD with the PRIME downwash algorithm, version 12345.
Meteorological Data	Soda Springs	2004-2008. See Section 3.1.6 of this memorandum.
Terrain	Considered	Receptor, building, and emissions source elevations were determined using USGS 1/3 arc second NAD83 National Elevation Dataset (NED) files.
Building Downwash	Considered	Plume downwash was considered for the structures associated with the facility.
Receptor Grid	Grid 1	10-meter spacing in area of maximum modeled impact to resolve maximum
	Grid 2	50-meter spacing out to at least 500 meters.
	Grid 3	100-meter spacing out to 2,500 meters.
	Grid 4	250-meter spacing out to 7,500 meters

3.1.2 Modeling protocol and Methodology

A modeling protocol was submitted to DEQ prior to the application. The protocol was submitted by RTP and DEQ provided an electronic protocol approval letter. Project-specific modeling was generally conducted using data and methods described in the protocol and in the *Idaho Air Modeling Guideline*.

3.1.3 Model Selection

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

AERMOD was used for the modeling analyses to evaluate impacts of the facility.

3.1.4 Meteorological Data

DEQ provided RTP with model-ready meteorological data processed from Soda Springs surface and Boise upper air meteorological data. Surface data were collected at the P4 Production facility outside of Soda Springs, Idaho. DEQ determined these data were reasonably representative for the Conda site. More representative data of sufficient quality for use in dispersion models were not available for the area.

3.1.5 Terrain Effects

RTP used 1/3 arc second National Elevation Dataset (NED) files, in the NAD83 datum, to calculate elevations of receptors. The terrain preprocessor AERMAP was used to extract the elevations from the NED files and assign them to receptors in the modeling domain in a format usable by AERMOD. AERMAP also determined the hill-height scale for each receptor. The hill-height scale is an elevation value based on the surrounding terrain which has the greatest effect on that individual receptor. The model 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.

3.1.6 Building Downwash

Potential downwash effects on the emissions plume were accounted for in the model by using building parameters as described by RTP. The Building Profile Input Program for the PRIME downwash algorithm (BPIP-PRIME) was used to calculate direction-specific dimensions and Good Engineering Practice (GEP) stack height information from building dimensions/configurations and release parameters for input to AERMOD.

3.1.7 Ambient Air Boundary

The application indicated the general public does not have ready access to the site, although there is no fence to preclude access. Therefore, all areas external to buildings were considered to be ambient air, and receptors were placed within such areas accordingly. This approach is very conservative, as DEQ's minor source modeling approach is to allow ambient air exclusion of areas where the applicant has a legal right to preclude public access and public access is effectively precluded by measures such as signage, patrol, etc.

3.1.8 Receptor Network

Table 3 describes the receptor network used in the submitted modeling analyses. DEQ contends that the receptor network was adequate to reasonably assure compliance with applicable air quality standards at all ambient air locations.

3.2 Emission Rates

Emissions rates of criteria pollutants and TAPs for the proposed project were provided by the applicant for various applicable averaging periods. DEQ modeling review, described in this memorandum, did not include review of emissions rates for accuracy. Review and approval of estimated emissions was the responsibility of the DEQ permit writer. DEQ modeling review included verification that the application's potential emissions rates were properly used in the model.

3.2.1 Criteria Pollutant Emissions Rate

Table 4 lists criteria pollutant emissions rates used in the project-specific modeling analyses for all applicable averaging periods. The rates listed represent the maximum allowable rate as averaged over the specified period.

Table 4. CONDA PILOT PLANT CRITERIA POLLUTANT EMISSIONS USED IN ANALYSES

Emissions Point in Model	Pollutant	Averaging Period	Emissions Rate
PILOTCAL – calciner stack	$PM_{2.5}$[a]	24-hour	0.57 lb/hr
		Annual	1.06 ton/yr
	PM_{10}[b]	24-hour	1.13 lb/hr
	NOx[c]	1-hour	1.05 lb/hr
		Annual	1.96 ton/yr
	SO_2[d]	1-hour, 3-hour	1.2 lb/hr
		24-hour	1.2 lb/hr
		Annual	2.27 ton/yr
	CO[e]	1-hour, 8-hour	0.31 lb/hr
	Pb[f]	monthly	0.004 lb/month
Truck Unloading	$PM_{2.5}$	24-hour	0.00087 lb/hr
		Annual	0.000049 ton/yr
	PM_{10}	24-hour	0.0058 lb/hr
Raw Rock Storage Pile	$PM_{2.5}$	24-hour	0.0029 lb/hr
		Annual	0.0080 ton/yr
	PM_{10}	24-hour	0.0072 lb/hr
Feed Hopper Loading	$PM_{2.5}$	24-hour	0.00087 lb/hr
		Annual	0.000049 ton/yr
	PM_{10}	24-hour	0.0058 lb/hr
Product Transfer to Storage	$PM_{2.5}$	24-hour	0.0083 lb/hr
		Annual	0.00047 ton/yr
	PM_{10}	24-hour	0.055 lb/hr
Product Storage Pile	$PM_{2.5}$	24-hour	0.012 lb/hr
		Annual	0.034 ton/yr
	PM_{10}	24-hour	0.030 lb/hr
Truck Loading	$PM_{2.5}$	24-hour	0.0083 lb/hr
		Annual	0.00047 ton/yr
	PM_{10}	24-hour	0.055 lb/hr
Haul Roads	$PM_{2.5}$	24-hour	0.0147 lb/hr
		Annual	0.020 ton/yr
	PM_{10}	24-hour	0.147 lb/hr
TOTAL	$PM_{2.5}$	24-hour	0.62 lb/hr
		Annual	1.12 ton/yr
	PM_{10}	24-hour	1.4
	NOx	1-hour	1.05 lb/hr
		Annual	1.96 ton/yr
	SO_2	1-hour, 3-hour	1.2 lb/hr
		24-hour	1.2 lb/hr
		Annual	2.27 ton/yr
	CO	1-hour, 8-hour	0.31 lb/hr
	Pb	monthly	0.004 lb/month

a. Particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers.
b. Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers.
c. Nitrogen oxides.
d. Sulfur dioxide.
e. Carbon Monoxide.
f. Lead.

Table 5 provides the emissions-based modeling applicability summary. Modeling thresholds are provided in the *Idaho Air Modeling Guideline*. PM_{10} and $PM_{2.5}$ modeling thresholds were adjusted for the project as described in Table 5. Modeling thresholds published in the *Idaho Air Modeling Guideline* were based on assuring an ambient impact of less than established SIL for that specific pollutant and averaging period. This is a very conservative approach for projects that involve a new source in an area where there are no co-contributing sources, such as the Simplot Pilot Plant Calciner. However, the SIL-based modeling thresholds can be modified to assure NAAQS compliance rather than SIL compliance. Modeling is not necessary when facility-wide emissions (including co-contributing sources) are below the NAAQS-based adjusted thresholds. As shown in Table 5, emissions rates were below applicable modeling thresholds for all criteria pollutants.

Table 5. Modeling Applicability Analysis Results

Pollutant	Averaging Period	Emissions	Level I Modeling Thresholds	Level II Modeling Thresholds	Modeling Required
$PM_{2.5}$	24-hour	0.62 lb/hr	0.90[a]	Not needed	No
	Annual	1.12 ton/yr	9.3[b]	Not needed	No
PM_{10}	24-hour	1.4 lb/hr	3.4[c]	Not needed	No
NOx	1-hour	1.05 lb/hr	0.20	2.4	No[d]
	Annual	1.96 ton/yr	1.2	14	No[d]
SO_2	1-hour, 3-hour	1.2 lb/hr	0.21	2.5	No[d]
	24-hour	1.2 lb/hr	0.21	2.5	No[d]
	Annual	2.27 ton/yr	1.2	14	No[d]
CO	1-hour, 8-hour	0.31 lb/hr	15		No
Pb	monthly	0.004 lb/month	14		No

a. Threshold of 0.054 lb/hr adjusted to assure NAAQS compliance rather than impacts below the 1.2 $\mu g/m^3$ SIL. This approach demonstrates compliance provided facility-wide emissions are used. Using the 35 $\mu g/m^3$ NAAQS and a 15 $\mu g/m^3$ background level, the allowable increment is 35 – 15 = 20 $\mu g/m^3$. The revised threshold is then calculated by multiplying the SIL-based threshold by the ratio of the allowable increment to the SIL: (0.054 lb/hr)(20 $\mu g/m^3$ / 1.2 $\mu g/m^3$) = 0.90 lb/hr.

b. Threshold of 0.35 TPY adjusted to assure NAAQS compliance rather than impacts below the 0.3 $\mu g/m^3$ SIL. This approach demonstrates compliance provided facility-wide emissions are used. Using the 15 $\mu g/m^3$ NAAQS and a 7 $\mu g/m^3$ background level, the allowable increment is 15 – 7 = 8 $\mu g/m^3$. The revised threshold is then calculated by multiplying the SIL-based threshold by the ratio of the allowable increment to the SIL: (0.35 TPY)(8 $\mu g/m^3$ / 0.3 $\mu g/m^3$) = 9.3 TPY.

c. Threshold of 0.22 lb/hr adjusted to assure NAAQS compliance rather than impacts below the 5 $\mu g/m^3$ SIL. This approach demonstrates compliance provided facility-wide emissions are used. Using the 150 $\mu g/m^3$ NAAQS and a 73 $\mu g/m^3$ background level, the allowable increment is 150 – 73 = 77 $\mu g/m^3$. The revised threshold is then calculated by multiplying the SIL-based threshold by the ratio of the allowable increment to the SIL: (0.22 lb/hr)(77 $\mu g/m^3$ / 5 $\mu g/m^3$) = 3.4 lb/hr.

d. DEQ determined Level II Modeling Thresholds were appropriate for the source because: 1) there are no other emissions sources at the site; 2) emissions occur from an elevated stack having an uninterrupted vertical release and released at an elevated temperature; 3) although receptors were conservatively modeled in all locations, the property boundary of the site is considerably further away from the source and public access is generally precluded from the area; 4) there are no identified sensitive receptors in the area.

3.2.2 TAP Emissions Rates

RTP modeled those TAPs where the increase in TAP emissions associated with the proposed project exceeded the emissions screening levels (ELs) of Idaho Air Rules Section 585 and 586, with Section 586 ELs adjusted by a factor of 10 for a short-term source.

Table 6 provides modeled emissions rates for TAPs where those rates exceeded the ELs. Emissions of other TAPs were below applicable ELs except for arsenic. Arsenic emissions of 1.3 E-5 pounds/hour were above the 1.5 E-6 pounds/hour EL, but below the short-term adjusted EL of 1.5 E-5 pounds/hour.

Table 6. TAP EMISSIONS USED IN ANALYSES

Emissions Point in Model	Pollutant	Averaging Period	Emissions Rate (lb/hr)[a]
PILOTCAL – calciner stack	Cadmium	Annual	2.4 E-4
	Chromium 6+	Annual	4.6 E-5

a. Pounds per hour emissions rate used in modeling analyses for specified averaging periods.

3.3 Emission Release Parameters and Plant Criteria

Table 7 lists emissions release parameters for sources modeled. Parameters appeared to be within normally expected ranges for the source types modeled.

Table 7. EMISSIONS RELEASE PARAMETERS

Release Point /Location	Source Type	Stack Height (m)[a]	Modeled Diameter (m)	Stack Gas Temp. (K)[b]	Stack Gas Flow Velocity (m/sec)[c]
PILOTCAL	Point	12.2	0.15	322	18.1

a. Meters.
b. Kelvin.
c. Meters per second.

3.4 Results for Significant Impact Level and Cumulative NAAQS Analyses

All emissions rates of criteria pollutants were below applicable modeling thresholds; therefore, a SIL analysis was not performed.

3.5 Results for Toxic Air Pollutant Analyses

Table 8 presents results for TAP modeling. RTP modeled TAPs by modeling a unit emissions rate of 1.0 pounds/hour. The TAP specific impact was then calculated by multiplying the model result for 1.0 pounds/hour by the allowable TAP emissions rate in pounds/hour. All impacts were below the applicable AACCs as adjusted for a short-term source.

Table 8. RESULTS FOR TOXIC AIR POLLUTANT ANALYSES

Pollutant	Averaging Period	Maximum Modeled Concentration ($\mu g/m^3$)[a]	AACC TAP Increment[b] ($\mu g/m^3$)	Percent of Increment
Cadmium	5-year	3.72E-3	5.6 E-3	66%
Chromium 6+	5-year	7.10E-4	8.3 E-4	85%

a. Micrograms per cubic meter.
b. Toxic Air Pollutant allowable increment impact listed in Idaho Air Rules Section 586 and adjusted by the short-term adjustment factor (a factor of 10).

4.0 Conclusions

The ambient air impact analyses demonstrated to DEQ's satisfaction that emissions from the proposed Simplot calciner pilot plant project will not cause or significantly contribute to a violation of any ambient air quality standard.

APPENDIX C – FACILITY DRAFT COMMENTS

The following comments were received from the facility on August 22, 2013:

Facility Comment: Permit Tables 1.1 and 2.1 – The burner model is a "Maxon 3 Kinemax" burner rated at a maximum of 2.0 MMBtu/hr, as this information is needed in Tables 1.1 and 2.1."

DEQ Response: The requested change will be made to the permit (as well as the Statement of Basis).

Facility Comment: Permit Conditions 2.9, 2.11, and 2.12 – These conditions specify operating ranges for pollution control equipment. We do not know whether these are appropriate for this project as specific control equipment has not been selected. Simplot would like to recommend a wording change that indicates we will maintain pressure drops according to an O&M manual. We would like to suggest that this manual be developed by Simplot to ensure the proper operation of pollution control equipment."

DEQ Response: The requested change will be made to the permit.

Facility Comment: Permit Conditions 2.15 through 2.17 – These conditions specify that the daily monitoring requirements be tied to the operation of the plant, so that recording data does not need to occur on days when the pilot calciner is not operational.

DEQ Response: The requested changes will be made to the permit. Note: Permit condition 2.16 does not require daily monitoring, only monthly. Therefore, no change was made to this permit condition.

Facility Comment: Permit Conditions Condition 3.2 – This condition also suggests daily inspections. Much like the above comment, Simplot suggests that this be mandatory on operational days. This calciner will not consistently operate 7 days per week".

DEQ Response: The permit condition states "…under normal operating conditions…" which implies that the plant would be operating when the inspection is performed. In addition, permittees are required to control fugitive emissions at all times. Therefore, the requested change will not be made to the permit.

Facility Comment: Statement of Basis - At the top of page 8, Simplot would like clarification on what is meant by the statement: "For this Calciner operation uncontrolled PTE is assumed to be the same as uncontrolled PTE."

DEQ Response: The statement should have stated that "…controlled PTE is assumed to be the same as uncontrolled PTE." Therefore, the statement will be corrected.

Facility Comment: Statement of Basis - On page 21, in the discussions on permit conditions 2.8-2.9 and 2.11-2.12, Simplot suggests modifying the reference to manufacturer specifications to O&M manual developed by Simplot.

DEQ Response: The requested changes will be made to the Statement of Basis.

APPENDIX D – PROCESSING FEE

PTC Fee Calculation

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

Company: J.R. Simplot Co. - Conda Pumping
Address: 3064 Conda Rd.
City: Soda Springs
State: ID
Zip Code: 83276
Facility Contact: Scott Lusty
Title: Responsible official
AIRS No.: 029-00040

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	2.3	0	2.3
CO	0.6	0	0.6
PM10	2.1	0	2.1
VOC	0.1	0	0.1
TAPS/HAPS	0.0	0	0.0
Total:	0.0	0	**7.0**
Fee Due	$ 2,500.00		

Comments: