

Statement of Basis

**Permit to Construct No. P-2013.0041
Project ID 61326**

**J R Simplot Co. - EMT
Pocatello, Idaho**

Facility ID 005-00088

Final

June 19, 2014
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D.P.

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 NOMENCLATURE3

FACILITY INFORMATION5

 Description5

 Permitting History5

 Application Scope5

 Application Chronology5

TECHNICAL ANALYSIS6

 Emissions Units and Control Equipment6

 Emissions Inventories.....6

 Ambient Air Quality Impact Analyses9

REGULATORY ANALYSIS.....9

 Attainment Designation (40 CFR 81.313).....9

 Facility Classification.....9

 Permit to Construct (IDAPA 58.01.01.201).....10

 Tier II Operating Permit (IDAPA 58.01.01.401)10

 Visible Emissions (IDAPA 58.01.01.625)10

 Title V Classification (IDAPA 58.01.01.300, 40 CFR Part 70).....10

 PSD Classification (40 CFR 52.21).....11

 NSPS Applicability (40 CFR 60)11

 NESHAP Applicability (40 CFR 61)11

 MACT Applicability (40 CFR 63)17

 Permit Conditions Review.....17

PUBLIC REVIEW.....18

 Public Comment Opportunity.....18

APPENDIX A – EMISSIONS INVENTORIES.....19

APPENDIX B – FACILITY DRAFT COMMENTS20

APPENDIX C – PROCESSING FEE23

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 ₂ e | 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 |
| <i>Rules</i> | <i>Rules for the Control of Air Pollution in Idaho</i> |
| 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 |
| µg/m ³ | micrograms per cubic meter |

FACILITY INFORMATION

Description

The J.R. Simplot – EMT facility currently uses a 60-inch bench scale rotary kiln to study the thermal beneficiation of phosphate ore. The phosphate ore study is being used to determine operational parameters for the proposed Conda Pilot Calciner. The purpose of the study is to determine whether the thermal beneficiation of phosphate ore is suitable for larger scale operation. Due to the small size and capacity of the equipment it is not feasible to utilize the lab scale equipment on a long term basis.

Currently a batch quantity of phosphate ore from the Smoky Canyon Mine is placed in the rotary kiln. The phosphate ore is roasted at various temperatures and durations to determine the optimal evolution of volatile constituents. There is no positive air draw on the kiln, as it does not have an internal blower. Off-gas will be collected and controlled with a baghouse. Dilution air is necessary in the off-gas to reduce the gas stream temperature to ensure it does not melt the ductwork routing it to the baghouse. The kiln does not have any combustion sources as the heat required by the kiln to operate is supplied by electricity.

Information from this bench-scale study is being utilized to help guide the pilot calciner operation planned for the Conda operation.

As a result of this project the kiln will also be used in the recovery of sulfur from phosphogypsum. When this operation is occurring the exhaust from the baghouse will be routed through a

Permitting History

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

December 2, 2013 P-2013.0041, Initial permit for a bench scale rotary kiln to study the thermal beneficiation of phosphate ore, Permit status (A, but will become S upon issuance of this permit)

Application Scope

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

The applicant has proposed to:

- Modify the permit for the beneficiation operation to allow the processing of phosphogypsum in addition to phosphate ore.

Application Chronology

February 14, 2014 DEQ received an application and an application fee.

February 25 – March 12, 2014 DEQ provided an opportunity to request a public comment period on the application and proposed permitting action.

April 14, 2014 DEQ determined that the application was complete.

May 13, 2014 DEQ made available the draft permit and statement of basis for peer and regional office review.

May 19, 2014 DEQ made available the draft permit and statement of basis for applicant review.

June 17, 2014 DEQ received the permit processing fee.

June 19, 2014 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. |
|---------------|--|--|-----------------------|
| BH010 | <u>Bench Scale Kiln:</u> Manufacturer: Quinn Process Equipment Co. Model No.: QPEC 6" Laboratory Rotary Bench Kiln Max process rate: 23 lb/batch Process proposed rate: 9 lb/batch State temperature: 90-120 °F | <u>Kiln Baghouse:</u> Manufacturer: Camfil Model No.: GS4M Maximum air flow rate: 1,000 cfm Process flow rate: 100 cfm Bubbler water pH: 7 or greater when processing phosphogypsum Stack temperature: 90-120 °F | Not modeled |

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 kiln operation when beneficiating phosphate ore operations at the facility (see Appendix A) associated with this proposed project. Emissions estimates of criteria pollutant, GHG, HAP and TAP PTE were based on emission factors from AP-42, operation of 1,300 hours per year, a throughput of 2.6 tons per year of phosphogypsum, and process information specific to the facility for this proposed project.

Uncontrolled Potential to Emit

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

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

The following table presents the uncontrolled Potential to Emit for regulated air pollutants as submitted by the Applicant and verified by DEQ staff. See Appendix A for a detailed presentation of the calculations and the assumptions used to determine emissions for each emissions unit.

Table 2 UNCONTROLLED POTENTIAL TO EMIT FOR REGULATED AIR POLLUTANTS

| Source | PM ₁₀ /PM _{2.5} | SO ₂ | NO _x | CO | VOC | CO ₂ e |
|--|-------------------------------------|-----------------|-----------------|--------------|-------------|-------------------|
| | T/yr | T/yr | T/yr | T/yr | T/yr | T/yr |
| Point Sources | | | | | | |
| Bench Scale Kiln (when processing phosphate ore) | 0.24 | 0.08 | 0.01 | 0.004 | 0.0067 | 12.35 |
| Bench Scale Kiln (when processing phosphogypsum) | 0.000015 | 8.25 | 0.0 | 28.82 | 0.0 | 22.64 |
| Total, Point Sources | 0.24 | 8.33 | 0.01 | 28.82 | 0.01 | 34.99 |

Pre-Project Potential to Emit

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

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

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

| Source | PM ₁₀ /PM _{2.5} | | SO ₂ | | NO _x | | CO | | VOC | | CO ₂ e | |
|--|-------------------------------------|---------------------|----------------------|---------------------|----------------------|---------------------|----------------------|---------------------|----------------------|---------------------|----------------------|---------------------|
| | 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) |
| Bench Scale Kiln (when processing phosphate ore) | 0.00 | 0.000092 | 0.00 | 0.0067 | 0.00 | 0.0012 | 0.00 | 0.00034 | 0.00 | 0.000056 | 0.00 | 1.01 |
| Pre-Project Totals | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.01 |

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

Post Project Potential to Emit

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

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

| Source | PM ₁₀ /PM _{2.5} | | SO ₂ | | NO _x | | CO | | VOC | | CO ₂ e | |
|--|-------------------------------------|---------------------|----------------------|---------------------|----------------------|---------------------|----------------------|---------------------|----------------------|---------------------|----------------------|---------------------|
| | 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) |
| Bench Scale Kiln (when processing phosphate ore) | 0.00 | 0.000092 | 0.00 | 0.0067 | 0.00 | 0.0012 | 0.00 | 0.00034 | 0.00 | 0.000056 | 0.00 | 1.01 |
| Bench Scale Kiln (when processing phosphogypsum) | 0.00 | 0.00000027 | 0.00 | 0.0012 | 0.00 | 0.00 | 0.00 | 0.0086 | 0.00 | 0.00 | 0.00 | 0.0067 |
| Post Project Totals | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 1.02 |

- 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} | |
|-------------------------------------|-------------------------------------|-------------|-----------------|-------------|-----------------|-------------|-------------|-------------|-------------|-------------|------------------|-------------|
| | lb/hr | T/yr | lb/hr | T/yr | lb/hr | T/yr | lb/hr | T/yr | lb/hr | T/yr | lb/hr | T/yr |
| Pre-Project Potential to Emit | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.01 |
| Post Project Potential to Emit | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 1.02 |
| Changes in Potential to Emit | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.01 |

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) |
|---------------------------------------|---|--|---|---|--------------------------------|
| Antimony & compounds | 0.00E-03 | 1.71E-12 | 0.0000000000017 | 0.033 | No |
| Barium, soluble compounds | 0.00E-03 | 3.82E-10 | 0.00000000038 | 0.033 | No |
| Cobalt metal, dust, and fume | 0.00E-03 | 6.50E-12 | 0.0000000000065 | 0.0033 | No |
| Copper fume | 0.00E-03 | 2.51E-10 | 0.000000000251 | 0.013 | No |
| Flourides, as F | 0.00E-03 | 6.32E-02 | 0.0632 | 0.167 | No |
| Manganese dust & compounds | 0.00E-03 | 4.75E-11 | 0.00000000005 | 0.333 | No |
| Selenium | 0.00E-03 | 1.21E-10 | 0.00000000012 | 0.013 | No |
| Thallium | 0.00E-03 | 1.60E-12 | 0.000000000002 | 0.007 | No |
| Vanadium | 0.00E-03 | 4.26E-10 | 0.00000000043 | 0.003 | No |
| Zinc oxide dust | 0.00E-03 | 6.71E-10 | 0.00000000067 | 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 58.01.01.586 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) |
|--|---|--|---|--|---------------------------------------|
| Arsenic compounds | 0.0 | 3.51E-11 | 0.00000000000351 | 1.5E-06 | No |
| Beryllium & compounds | 0.0 | 3.42E-13 | 0.000000000000342 | 2.8E-05 | No |
| Cadmium and compounds | 0.0 | 3.10E-10 | 0.000000000031 | 3.7E-06 | No |
| Chromium (VI) & compounds | 0.0 | 2.90E-10 | 0.00000000029 | 5.6E-07 | No |
| Nickel | 0.0 | 8.73E-11 | 0.0000000000873 | 2.7E-05 | No |

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

Ambient Air Quality Impact Analyses

An Ambient Air Quality Impact Analysis was not performed for this project because the increases in PM₁₀/PM_{2.5}, SO₂, NO_x, CO, VOC, and HAP 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 Guideline¹. Refer to the Emissions Inventories section for additional information concerning the emission inventories.

REGULATORY ANALYSIS

Attainment Designation (40 CFR 81.313)

The facility is located in Bannock County, which is designated as attainment or unclassifiable for PM_{2.5}, PM₁₀, SO₂, NO₂, 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 8 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} | 0.24 | 0.00 | 100 | No |
| SO ₂ | 8.33 | 0.01 | 100 | No |
| NO _x | 0.01 | 0.00 | 100 | No |
| CO | 28.82 | 0.01 | 100 | No |
| VOC | 0.01 | 0.00 | 100 | No |
| CO ₂ e | 34.99 | 1.02 | 100,000 | No |

As demonstrated in Table 8, the facility has an uncontrolled and controlled potential to emit for PM₁₀, PM_{2.5}, SO₂, NO_x, CO, and VOC emissions less than the Major Source thresholds of 100 T/yr for each pollutant. In addition, total HAP emissions for the facility are less than 1 ton per year which is 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 not designated as a Synthetic Minor facility.

Permit to Construct (IDAPA 58.01.01.201)

IDAPA 58.01.01.201 Permit to Construct Required

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

Tier II Operating Permit (IDAPA 58.01.01.401)

IDAPA 58.01.01.401 Tier II Operating Permit

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

Visible Emissions (IDAPA 58.01.01.625)

IDAPA 58.01.01.625 Visible Emissions

The sources of PM₁₀ emissions at this facility are subject to the State of Idaho visible emissions standard of 20% opacity. This requirement is assured by Permit Condition 2.3.

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

IDAPA 58.01.01.301 Requirement to Obtain Tier I Operating Permit

Post project facility-wide emissions from this facility do not have a potential to emit greater than 100 tons per year for all criteria pollutants or 10 tons per year for any one HAP or 25 tons per year for all HAP combined as demonstrated previously in the Emissions Inventories Section of this analysis. Therefore, the facility is not a Tier I source in accordance with IDAPA 58.01.01.006 and the requirements of IDAPA 58.01.01.301 do not apply.

PSD Classification (40 CFR 52.21)

40 CFR 52.21

Prevention of Significant Deterioration of Air Quality

The facility is not a major stationary source as defined in 40 CFR 52.21(b)(1), nor is it undergoing any physical change at a stationary source not otherwise qualifying under paragraph 40 CFR 52.21(b)(1) as a major stationary source, that would constitute a major stationary source by itself as defined in 40 CFR 52. Therefore in accordance with 40 CFR 52.21(a)(2), PSD requirements are not applicable to this permitting action. The facility is/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 kiln used for calcining phosphate ore the following NSPS requirements may apply to this facility:

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

Sections that are highlighted are applicable to the emissions units at the facility.

40 CFR 60, Subpart NN

Standards of Performance for Phosphate Rock Plants

§60.400

Applicability and designation of affected facility

Section (a) states that 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.

As stated previously (see Statement of Basis for project 61229), the bench scale kiln being used as a calciner at the facility has a capacity significantly under the applicability threshold of 4 tons per hour. Therefore, NSPS Subpart NN is not applicable and no further discussion is required.

NESHAP Applicability (40 CFR 61)

Because the facility has a kiln used for calcining phosphogypsum the following NESHAP requirements apply to this facility:

- **40 CFR 61, Subpart R – National Emissions Standards for Radon Emissions From Phosphogypsum Stacks**

Sections that are highlighted are applicable to the emissions units at the facility.

40 CFR 61, Subpart R

National Emissions Standards for Radon Emissions From Phosphogypsum Stacks

§61.200

Designation of facilities

The provisions of this subpart apply to each owner or operator of a phosphogypsum stack, and to each person who owns, sells, distributes, or otherwise uses any quantity of phosphogypsum which is produced as a result of wet acid phosphorus production or is removed from any existing phosphogypsum stack.

§61.201

Definitions

The definitions of this subpart apply.

§61.202

Standard

Each person who generates phosphogypsum shall place all phosphogypsum in stacks. Phosphogypsum may be removed from a phosphogypsum stack only as expressly provided by this subpart. After a phosphogypsum stack has become an inactive stack, the owner or operator shall assure that the stack does not emit more than 20 pCi/(m²-sec) (1.9 pCi/(ft²-sec)) of radon-222 into the air.

These requirements apply to the owner/operator of the phosphogypsum stack. The phosphogypsum stack is located at Simplot's Don Siding Plant and this requirement is included in the facilities Title V permit. Therefore, this requirement does not apply to this facility and no further discussion is required.

§61.203

Radon monitoring and compliance procedures.

(a) Within sixty days following the date on which a stack becomes an inactive stack, or within ninety days after the date on which this subpart first took effect if a stack was already inactive on that date, each owner or operator of an inactive phosphogypsum stack shall test the stack for radon-222 flux in accordance with the procedures described in 40 CFR part 61, appendix B, Method 115. EPA shall be notified at least 30 days prior to each such emissions test so that EPA may, at its option, observe the test. If meteorological conditions are such that a test cannot be properly conducted, then the owner or operator shall notify EPA and test as soon as conditions permit.

(b)(1) Within ninety days after the testing is required, the owner or operator shall provide EPA with a report detailing the actions taken and the results of the radon-222 flux testing. Each report shall also include the following information:

(i) The name and location of the facility;

(ii) A list of the stacks at the facility including the size and dimensions of each stack;

(iii) The name of the person responsible for the operation of the facility and the name of the person preparing the report (if different);

(iv) A description of the control measures taken to decrease the radon flux from the source and any actions taken to insure the long term effectiveness of the control measures; and

(v) The results of the testing conducted, including the results of each measurement.

(2) Each report shall be signed and dated by a corporate officer in charge of the facility and contain the following declaration immediately above the signature line: "I certify under penalty of law that I have personally examined and am familiar with the information submitted herein and based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment. See, 18 U.S.C. 1001."

(c) If the owner or operator of an inactive stack chooses to conduct measurements over a one year period as permitted by Method 115 in appendix B to part 61, within ninety days after the testing commences the owner or operator shall provide EPA with an initial report, including the results of the first measurement period and a schedule for all subsequent measurements. An additional report containing all the information in §61.203(b) shall be submitted within ninety days after completion of the final measurements.

(d) If at any point an owner or operator of a stack once again uses an inactive stack for the disposal of phosphogypsum or for water management, the stack ceases to be in inactive status and the owner or operator must notify EPA in writing within 45 days. When the owner or operator ceases to use the stack for disposal of phosphogypsum or water management, the stack will once again become inactive and the owner or operator must satisfy again all testing and reporting requirements for inactive stacks.

(e) If an owner or operator removes phosphogypsum from an inactive stack, the owner shall test the stack in accordance with the procedures described in 40 CFR part 61, appendix B, Method 115. The stack shall be tested within ninety days of the date that the owner or operator first removes phosphogypsum from the stack, and the test shall be repeated at least once during each calendar year that the owner or operator removes additional phosphogypsum from the stack. EPA shall be notified at least 30 days prior to an emissions test so that EPA may, at its option, observe the test. If meteorological conditions are such that a test cannot be properly conducted, then the owner shall notify EPA and test as soon as conditions permit. Within ninety days after completion of a test, the owner or operator shall provide EPA with a report detailing the actions taken and the results of the radon-222 flux testing. Each such report shall include all of the information specified by §61.203(b).

As discussed previously these requirements apply to the owner/operator of the phosphogypsum stack. The phosphogypsum stack is located at Simplot's Don Siding Plant and this requirement is included in the facilities Title V permit. Therefore, this requirement does not apply to this facility and no further discussion is required.

§61.204

Distribution and use of phosphogypsum for outdoor agricultural purposes.

Phosphogypsum may be lawfully removed from a stack and distributed in commerce for use in outdoor agricultural research and development and agricultural field use if each of the following requirements is satisfied:

- (a) The owner or operator of the stack from which the phosphogypsum is removed shall determine annually the average radium-226 concentration at the location in the stack from which the phosphogypsum will be removed, as provided by §61.207.
- (b) The average radium-226 concentration at the location in the stack from which the phosphogypsum will be removed, as determined pursuant to §61.207, shall not exceed 10 pCi/g (4500 pCi/lb).
- (c) All phosphogypsum distributed in commerce for use pursuant to this section by the owner or operator of a phosphogypsum stack shall be accompanied by a certification document which conforms to the requirements of §61.208(a).
- (d) Each distributor, retailer, or reseller who distributes phosphogypsum for use pursuant to this section shall prepare certification documents which conform to the requirements of §61.208(b).
- (e) Use of phosphogypsum for indoor research and development in a laboratory must comply with §61.205.

This facility is not engaged in the use of phosphogypsum in outdoor agricultural purposes. Therefore, this requirement does not apply to this facility and no further discussion is required.

§61.205

Distribution and use of phosphogypsum for indoor research and development.

(a) Phosphogypsum may be lawfully removed from a stack and distributed in commerce for use in indoor research and development activities, provided that it is accompanied at all times by certification documents which conform to the requirements of §61.208. In addition, before distributing phosphogypsum to any person for use in indoor research and development activities, the owner or operator of a phosphogypsum stack shall obtain from that person written confirmation that the research facility will comply with all of the limitations set forth in paragraph (b) of this section.

These requirements are assured by Permit Condition 2.7.

(b) Any person who purchases and uses phosphogypsum for indoor research and development purposes shall comply with all of the following limitations. Any use of phosphogypsum for indoor research and development purposes not consistent with the limitations set forth in this section shall be construed as unauthorized distribution of phosphogypsum.

(1) Each quantity of phosphogypsum purchased by a facility for a particular research and development activity shall be accompanied by certification documents which conform to the requirements of §61.208.

(2) No facility shall purchase or possess more than 3,182 kg (7,000 lb) of phosphogypsum for a particular indoor research and development activity. The total quantity of all phosphogypsum at a facility, as determined by summing the individual quantities purchased or possessed for each individual research and development activity conducted by that facility, may exceed 3,182 kg (7,000 lb), provided that no single room in which research and development activities are conducted shall contain more than 3,182 kg (7,000 lb).

(3) Containers of phosphogypsum used in indoor research and development activities shall be labeled with the following warning: "Caution: Phosphogypsum Contains Elevated Levels of Naturally Occurring Radioactivity."

(4) For each indoor research and development activity in which phosphogypsum is used, the facility shall maintain records which conform to the requirements of §61.209(c).

(5) Indoor research and development activities must be performed in a controlled laboratory setting which the general public cannot enter except on an infrequent basis for tours of the facility. Uses of phosphogypsum for outdoor agricultural research and development and agricultural field use must comply with §61.204.

(c) Phosphogypsum not intended for distribution in commerce may be lawfully removed from a stack by an owner or operator to perform laboratory analyses required by this subpart or any other quality control or quality assurance analyses associated with wet acid phosphorus production.

These requirements are assured by Permit Condition 2.8.

§61.207

Radium-226 sampling and measurement procedures.

(a) Before removing phosphogypsum from a stack for distribution in commerce pursuant to §61.204, or §61.206, the owner or operator of a phosphogypsum stack shall measure the average radium-226 concentration at the location in the stack from which phosphogypsum will be removed. Measurements shall be performed for each such location prior to the initial distribution in commerce of phosphogypsum removed from that location and at least once during each calendar year while distribution of phosphogypsum removed from the location continues.

(1) A minimum of 30 phosphogypsum samples shall be taken at regularly spaced intervals across the surface of the location on the stack from which the phosphogypsum will be removed. Let n_1 represent the number of samples taken.

(2) Measure the radium-226 concentration of each of the n_1 samples in accordance with the analytical procedures described in 40 CFR part 61, appendix B, Method 114.

(3) Calculate the mean, \bar{x}_1 , and the standard deviation, s_1 , of the n_1 radium-226 concentrations:

$$\bar{x}_1 = \frac{\sum_{i=1}^{n_1} x_i}{n_1},$$
$$s_1 = \sqrt{\frac{\sum_{i=1}^{n_1} (x_i - \bar{x}_1)^2}{n_1 - 1}},$$

Where \bar{x}_1 and s_1 are expressed in pCi/g.

(4) Calculate the 95th percentile for the distribution, \bar{x}^* , using the following equation:

$$\bar{x}^* = \bar{x}_1 + 1.64 \left(\frac{s_1}{\sqrt{n_1}} \right),$$

Where \bar{x}^* is expressed in pCi/g.

(5) If the purpose for removing phosphogypsum from a stack is for distribution to commerce pursuant to §61.206, the owner or operator of a phosphogypsum stack shall report the mean, standard deviation, 95th percentile and sample size. If the purpose for removing phosphogypsum from a stack is for distribution to commerce pursuant to §61.204, the additional sampling procedures set forth in paragraphs (b) and (c) of this section shall apply.

(b) Based on the values for \bar{x}_1 and \bar{x}^* calculated in paragraphs paragraphs (a)(3) and (4) of this section, determine which of the following conditions will be met:

(1) If $\bar{x}_1 < 10$ pCi/g and $\bar{x}^* \leq 10$ pCi/g; phosphogypsum may be removed from this area of the stack for distribution in commerce pursuant to §61.204.

(2) If $\bar{x}_1 < 10$ pCi/g and $\bar{x}^* > 10$ pCi/g, the owner or operator may elect to follow the procedures for further sampling set forth in paragraph (c) of this section:

(3) If $\bar{x}_1 \geq 10$ pCi/g; phosphogypsum shall not be removed from this area of the stack for distribution in commerce pursuant to §61.204.

(c) If the owner or operator elects to conduct further sampling to determine if phosphogypsum can be removed from this area of the stack, the following procedure shall apply. The objective of the following procedure is to demonstrate, with a 95% probability, that the phosphogypsum from this area of the stack has a radium-226 concentration no greater than 10 pCi/g. The procedure is iterative, the sample size may have to be increased more than one time; otherwise the phosphogypsum cannot be removed from this area of the stack for distribution to commerce pursuant to §61.204.

(1)(i) Solve the following equation for the total number of samples required:

$$n_2 = \left(\frac{1.64 s_1}{10 - \bar{x}_1} \right)^2$$

(ii) The sample size n_2 shall be rounded upwards to the next whole number. The number of additional samples needed is $n_A = n_2 - n_1$.

(2) Obtain the necessary number of additional samples, n_A , which shall also be taken at regularly spaced intervals across the surface of the location on the stack from which phosphogypsum will be removed.

(3) Measure the radium-226 concentration of each of the n_A additional samples in accordance with the analytical procedures described in 40 CFR part 61, appendix B, Method 114.

(4) Recalculate the mean and standard deviation of the entire set of n_2 radium-226 concentrations by joining this set of n_A concentrations with the n_1 concentrations previously measured. Use the formulas in paragraph (a)(3) of this section, substituting the entire set of n_2 samples in place of the n_1 samples called for in paragraph (a)(3) of this section, thereby determining the mean, \bar{x}_2 , and standard deviation, s_2 , for the entire set of n_2 concentrations.

(5) Repeat the procedure described in paragraph (a)(4) of this section, substituting the recalculated mean, \bar{x}_2 , for \bar{x}_1 , the recalculated standard deviation, s_2 , for s_1 , and total sample size, n_2 , for n_1 .

(6) Repeat the procedure described in paragraph (b) of this section, substituting the recalculated mean, \bar{x}_2 for \bar{x}_1 .

As discussed previously these requirements apply to the owner/operator of the phosphogypsum stack. The phosphogypsum stack is located at Simplot's Don Siding Plant and this requirement is included in the facilities Title V permit. Therefore, this requirement does not apply to this facility and no further discussion is required.

§61.208

Certification Requirements

(a)(1) The owner or operator of a stack from which phosphogypsum will be removed and distributed in commerce pursuant to §61.204, §61.205, or §61.206 shall prepare a certification document for each quantity of phosphogypsum which is distributed in commerce which includes:

(i) The name and address of the owner or operator;

(ii) The name and address of the purchaser or recipient of the phosphogypsum;

(iii) The quantity of phosphogypsum, in kilograms or pounds sold or transferred;

(iv) The date of sale or transfer;

(v) A description of the intended end-use for the phosphogypsum;

(vi) The average radium-226 concentration, in pCi/g (pCi/lb), of the phosphogypsum, as determined pursuant to §61.207; and

(vii) The signature of the person who prepared the certification.

(2) The owner or operator shall retain the certification document for five years from the date of sale or transfer, and shall produce the document for inspection upon request by the Administrator, or his authorized representative. The owner or operator shall also provide a copy of the certification document to the purchaser or recipient.

As discussed previously these requirements apply to the owner/operator of the phosphogypsum stack. The phosphogypsum stack is located at Simplot's Don Siding Plant and this requirement is included in the facilities Title V permit. Therefore, this requirement does not apply to this facility and no further discussion is required.

(b)(1) Each distributor, retailer, or reseller who purchases or receives phosphogypsum for subsequent resale or transfer shall prepare a certification document for each quantity of phosphogypsum which is resold or transferred which includes:

- (i) The name and address of the distributor, retailer, or reseller;
- (ii) The name and address of the purchaser or recipient of the phosphogypsum;
- (iii) The quantity (in pounds) of phosphogypsum resold or transferred;
- (iv) The date of resale or transfer;
- (v) A description of the intended end-use for the phosphogypsum;
- (vi) A copy of each certification document which accompanied the phosphogypsum at the time it was purchased or received by the distributor, retailer, or reseller; and
- (vii) The signature of the person who prepared the certification.

(2) The distributor, retailer, or reseller shall retain the certification document for five years from the date of resale or transfer, and shall produce the document for inspection upon request by the Administrator, or his authorized representative. For every resale or transfer of phosphogypsum to a person other than an agricultural end-user, the distributor, retailer, or reseller shall also provide a copy of the certification document to the purchaser or transferee.

These requirements are assured by Permit Condition 2.9.

§61.209

Required records.

(a) Each owner or operator of a phosphogypsum stack must maintain records for each stack documenting the procedure used to verify compliance with the flux standard in §61.202, including all measurements, calculations, and analytical methods on which input parameters were based. The required documentation shall be sufficient to allow an independent auditor to verify the correctness of the determination made concerning compliance of the stack with flux standard.

(b) Each owner or operator of a phosphogypsum stack must maintain records documenting the procedure used to determine average radium-226 concentration pursuant to §61.207, including all measurements, calculations, and analytical methods on which input parameters were based. The required documentation shall be sufficient to allow an independent auditor to verify the accuracy of the radium-226 concentration.

As discussed previously these requirements apply to the owner/operator of the phosphogypsum stack. The phosphogypsum stack is located at Simplot's Don Siding Plant and this requirement is included in the facilities Title V permit. Therefore, this requirement does not apply to this facility and no further discussion is required.

(c) Each facility which uses phosphogypsum pursuant to §61.205 or §61.206 shall prepare records which include the following information:

- (1) The name and address of the person in charge of the activity involving use of phosphogypsum.
- (2) A description of each use of phosphogypsum, including the handling and processing that the phosphogypsum underwent.
- (3) The location of each site where each use of phosphogypsum occurred, including the suite and/or building number, street, city, county, state, and zip code.

(4) The mailing address of each facility using phosphogypsum, if different from paragraph (c)(3) of this section.

(5) The date of each use of phosphogypsum.

(6) The quantity of phosphogypsum used.

(7) The certified average concentration of radium-226 for the phosphogypsum which was used.

(8) A description of all measures taken to prevent the uncontrolled release of phosphogypsum into the environment.

(9) A description of the disposition of any unused phosphogypsum.

These requirements are assured by Permit Condition 2.12.

(d) These records shall be retained by the facility for at least five years from the date of use of the phosphogypsum and shall be produced for inspection upon request by the Administrator, or his authorized representative.

These requirements are assured by Permit Condition 2.13.

MACT Applicability (40 CFR 63)

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

Permit Conditions Review

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

PERMIT SCOPE

Permit Condition 1.1 describes the modifications to the existing processes at the facility process being permitted as a result of this project.

Permit Condition 1.3 explains which previous permit for the facility is being replaced as a result of this project.

Table 1.1 was updated to reflect the addition of the bubblers being installed as a result of this project.

KILN

Permit Condition 2.1 was modified to provide the updated process description for the emissions units permitted in this section of the permit.

Permit Condition 2.4 was modified to include the annual throughput limit of phosphogypsum as proposed by the Applicant.

Permit Condition 2.5 was modified to include the annual operational limit of the kiln when processing phosphogypsum as proposed by the Applicant.

Permit Condition 2.6 was modified to include that the bubblers shall be operating when processing phosphogypsum in the kiln as proposed by the Applicant.

As discussed previously Permit Conditions 2.7 thru 2.9 specify the requirements of NESHAP Subpart R.

Permit Condition 2.10 was modified to include additional recordkeeping requirements for when the Permittee processes phosphogypsum and to differentiate when the Permittee processes phosphate ore.

Permit Condition 2.11 was modified to include the manufacturer's recommendation for operation of the baghouse when the bubbler system is operating.

As discussed previously Permit Conditions 2.12 and 2.13 specify the requirements of NESHAP Subpart R.

PUBLIC REVIEW

Public Comment Opportunity

An opportunity for public comment period on the application was provided in accordance with IDAPA 58.01.01.209.01.c or IDAPA 58.01.01.404.01.c. During this time, there were no comments on the application and there was not a request for a public comment period on DEQ's proposed action. Refer to the chronology for public comment opportunity dates.

APPENDIX A – EMISSIONS INVENTORIES

Emissions Summary
Lab Scale Gypsum Sulfur Recovery

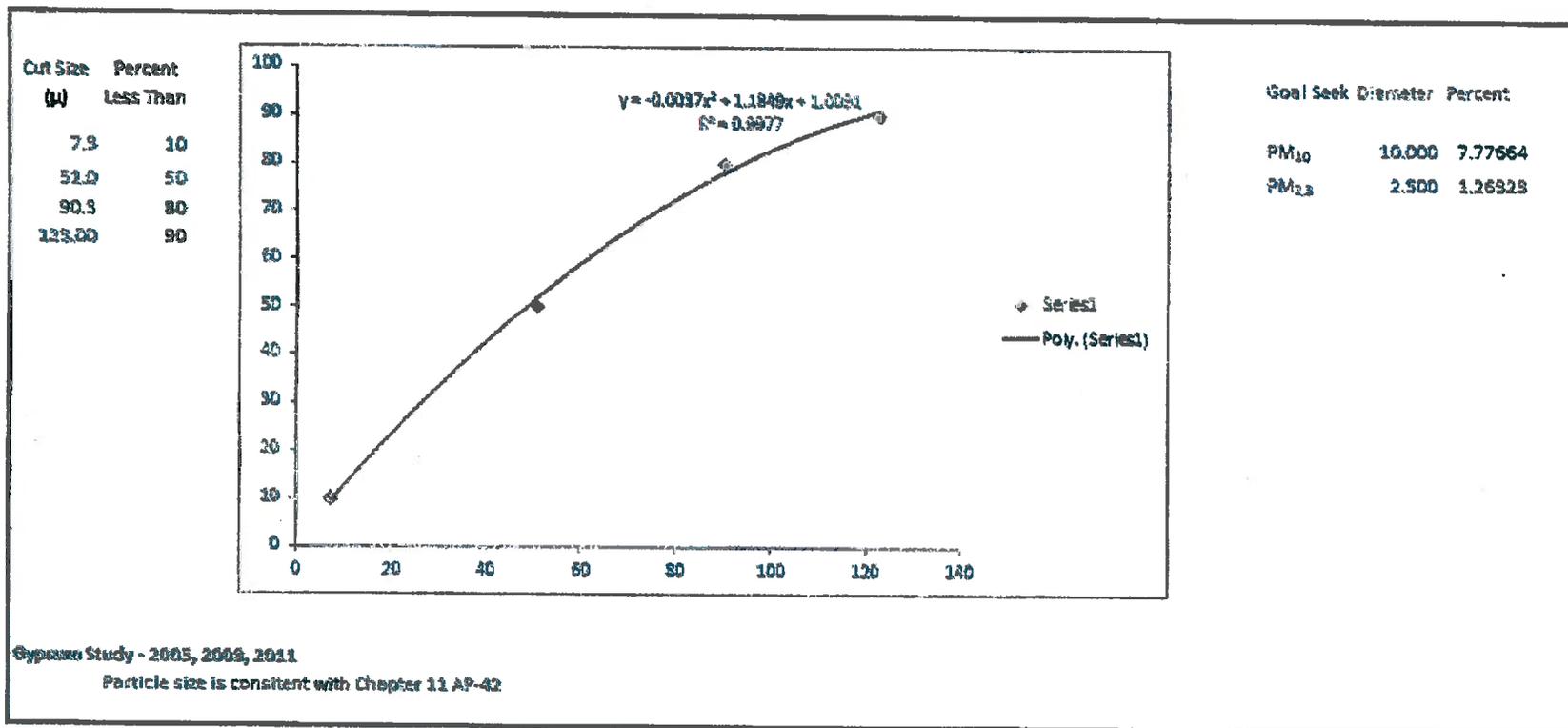
| ROTARY KILN PROJECT UNCONTROLLED EMISSIONS (Gypsum Project) | | | | | | | | | | | Mercury Rule |
|---|------------------|-------------------|-----------------|-----|-----------------|-------|-----------------|------|----------|----------|--------------|
| TONS/YEAR | | | | | | | | | | | lb/yr |
| PM | PM ₁₀ | PM _{2.5} | NO _x | VOC | SO _x | CO | CO ₂ | F | Pb | HAP | Hg |
| 5.84E-05 | 1.46E-05 | 7.38E-07 | NA | NA | 8.25 | 28.82 | 22.64 | 0.28 | 1.20E-08 | 2.77E-01 | 9.60E-07 |

| ROTARY KILN PROJECT PROJECT DESIGN EMISSIONS (Gypsum Project) | | | | | | | | | | | Mercury Rule |
|---|------------------|-------------------|-----------------|-----|-----------------|----------|-----------------|----------|----------|----------|--------------|
| TONS/YEAR | | | | | | | | | | | lb/yr |
| PM | PM ₁₀ | PM _{2.5} | NO _x | VOC | SO _x | CO | CO ₂ | F | Pb | HAP | Hg |
| 1.08E-06 | 2.70E-07 | 1.37E-08 | NA | NA | 1.22E-03 | 8.56E-03 | 6.72E-03 | 4.11E-05 | 1.76E-09 | 4.11E-02 | 1.41E-07 |

**Comparison to Modeling Thresholds
 Lab Scale Gypsum Sulfur Recovery**

| Pollutant | Level I | Level II | Units | Project | Status |
|-------------------------|----------------|-----------------|--------------|----------------|---------------|
| CO | 15 | 175 | PPH | 8.56E-03 | < L1 |
| NO_x | 1.2 | 14 | TPY | NA | NA |
| | 0.2 | 2.4 | PPH | NA | NA |
| SO₂ | 1.2 | 14 | TPY | 1.22E-03 | < L1 |
| | 0.21 | 2.5 | PPH | 1.88E-04 | < L1 |
| PM₁₀ | 0.22 | 2.6 | PPH | 2.08E-04 | < L1 |
| PM_{2.5} | 0.35 | 4.1 | TPY | 1.37E-08 | < L1 |
| | 0.054 | 0.63 | PPH | 1.05E-05 | < L1 |

Particle Size Distribution Emission Factor Calculation Lab Scale Gypsum Sulfur Recovery



Assumptions for Calculation Lab Scale Gypsum Sulfur Recovery

Control Efficiencies

Baghouse Operation Required by Permit issued December 2015 included in PTE

Bubblers added to remove SO₂

Caustic Scrubber in Overton operates between 95-97% efficiency based on stack tests

Bubblers in series should perform better due to surface area and time of contact

Conservatively assume each bubbler is 90% efficient

$$CE_{\text{Bubblers Overall}} = 1 - [1 - 90/100] * [1 - 90/100] * [1 - 90/100]$$

$$CE_{\text{Overall}} = 99.9 \quad \text{F \& SO}_2 \text{ Removal}$$

Particulate Removal - Caustic Scrubber <http://www.epa.gov/ttnchie1/mkb/documents/foack.pdf>

Per Fact Sheet CE is 50-95%, bubbler has better surface area exposure and time of contact

Assume 72.5 % CE (Conservative)

$$CE_{\text{Overall}} = 0.9792$$

HAPs will be in particulate form due to condenser in the project assume 72.5% CE

Production (ton/yr) = 8 lb/batch * batches/yr / 2,000 lb/ton

Assume 2 batches per day/ 365 days yr

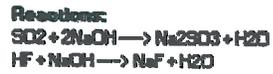
2.92 TPY PTE

2.6 TPY 4 lb/hr * 1900 hr/yr / 2,000 lb/ton

25% moisture content - process knowledge

Assumptions for Calculation Lab Scale Gypsum Sulfur Recovery

Kiln Scrubber (using NaOH)



- Assumptions:
 - ALL Sulfur convert to SO_2
 - ALL Fluorine come off as HF

| | lb. |
|---------------------|-------|
| Batch size in Kiln: | 8 |
| wt. S in kiln | 1.885 |
| wt. SO_2 in kiln | 3.765 |
| wt. % F in gyp 1.5% | |
| wt. F in kiln | 0.126 |
| wt. HF in kiln | 0.126 |

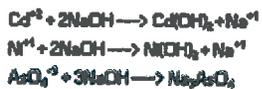
Molecular Weights:

| | |
|----------------------|--------|
| $CaSO_4 \cdot 2H_2O$ | 172.2 |
| S | 32.1 |
| SO_2 | 64.1 |
| $CaSO_4$ | 136.2 |
| F | 19 |
| HF | 20 |
| NaF | 42 |
| NaOH | 40 |
| Na_2SO_3 | 126.1 |
| CaS | 72.2 |
| H ₂ | 2.0158 |
| CO | 28.01 |
| H ₂ O | 18.02 |
| CO ₂ | 44.01 |
| CH ₄ | 16.04 |

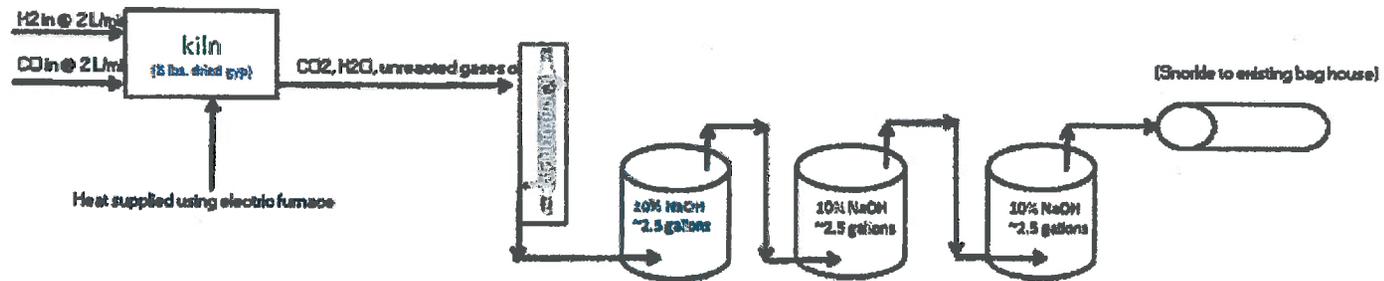
Densities: (g/ml)

| | |
|----------|------|
| NaOH 10% | 1.11 |
| NaOH 20% | 1.22 |

Metals reaction with oxides:



| Scrubber NaOH sales | | | |
|--------------------------------|---------------------|------|---------|
| lb. | lb. | lb. | gallons |
| SO_2 product 3.765 | NaOH consumed 4.693 | | |
| HF produced 0.126 | NaOH consumed 0.253 | | |
| Total NaOH required | | 5.0 | |
| excess NaOH (+20%) | | 10 | |
| Total NaOH required (as 100%) | | 5.9 | |
| Total NaOH required as 10% sol | | 59.4 | 6.41 |



| | K_{sp} (mol/L) |
|--|------------------|
| $Cd(OH)_2 \rightarrow [Cd^{2+}] \times [OH^-]^2$ | $7.2E-15$ |
| $Ni(OH)_2 \rightarrow [Ni^{2+}] \times [OH^-]^2$ | $5.5E-16$ |

HAP Analysis Lab Scale Gypsum Sulfur Recovery

Heavy metals in phospho-gypsum (mg/kg) from Pocatello and Rock Springs

NOTES:

- basis is assumed as anhydrous gypsum, and the analysis of the metals was assumed on an "as-is" result. The concentrations were scaled-up to account for moisture content
- OOS = "Out Of Specification"

| | |
|-----------------------|------|
| BASIS | |
| pounds OF kg DRY | |
| Kiln batch size: 8 | 3.84 |
| Kiln run time (hr): 2 | |

CaSO4 MW
 CaSO4.2H2O 172.2

| | | | | | |
|--|-----|----|---------------------------------------|------|---|
| moisture accounting | | | | | |
| 100 pounds wet gyp, anhydrous free moist | 20% | 80 | pounds left; drive off chemical water | 83.3 | pounds left as anhydrous CaSO4. Overall moisture content: 37% |

| element | boiling pt Celcius | melting pt Celcius | Pocatello mg/kg | Measured Pocatello V2014 | Rock Springs mg/kg | total in Kiln (Poc.) mg | total in Kiln (R.S.) mg | emissions Poc gpp lb/hr | emissions R.S gpp lb/hr | Steering Limit (lb/hr) | pocatello gpp | rock springs gpp | With Baghouse Required | | | With Bubblers Vorst Case (lb/hr) | | |
|-----------------|-----------------------|-----------------------|--------------------|--------------------------------|--------------------------|-------------------------------|-------------------------------|----------------------------|----------------------------|------------------------|------------------|------------------------|--------------------------------|--------------------------------|--------------------------|---|----------|--|
| | | | | | | | | | | | | | emission s Poc gpp lb/hr | emission s R.S gpp lb/hr | Vorst Case (lb/hr) | | | |
| Ag-metal | 2162 | 962 | 4.744 | | | | | 1.907E-05 | 4.8324E-07 | 0.007 | OK | OK | 1.9E-09 | 4.8E-11 | 1.902E-09 | OK | 3.90E-11 | |
| Ag-soluble comp | | | | 15 | 4.211 | 6.76 | 15.31 | 2.1394E-06 | 5.6490E-07 | 0.001 | OK | OK | 2.1E-09 | 5.5E-11 | 2.139E-09 | OK | 4.48E-11 | |
| As | 613 | 817 | 1.659 | | 0.123 | 0.123 | 0.48 | 7.4834E-06 | 1.8880E-05 | 1.60E-06 | OOS | OOS | 7.4E-10 | 1.7E-09 | 1.888E-09 | OK | 3.51E-11 | |
| Ba | 1645 | 727 | 45.776 | | 0.041 | 0.05 | 0.05 | 1.8349E-04 | 7.3438E-05 | 0.033 | OK | OK | 1.83E-08 | 7.3E-09 | 1.834E-08 | OK | 3.82E-10 | |
| Be | 2468 | 1287 | 0.041 | | 0.041 | 0.05 | 0.05 | 1.8441E-07 | 1.8441E-07 | 2.80E-06 | OK | OK | 1.84E-11 | 1.8E-11 | 1.844E-11 | OK | 3.42E-13 | |
| Cd | 787 | 321 | 37.203 | 17.9 | 0.150 | 135.28 | 0.85 | 1.492E-04 | 6.0285E-07 | 3.70E-06 | OOS | OK | 1.49E-08 | 6E-11 | 1.491E-08 | OK | 3.10E-10 | |
| Cr | 2871 | 1907 | 34.624 | 120.8 | 32.082 | 438.55 | 18.59 | 4.8341E-04 | 1.2932E-04 | 5.80E-07 | OOS | OOS | 4.83E-08 | 1.3E-08 | 4.834E-08 | OK | 1.01E-08 | |
| Cu | 2562 | 1085 | 39.079 | 32.8 | 5.414 | 18.95 | 18.89 | 1.9667E-04 | 2.1703E-05 | 0.043 | OK | OK | 1.97E-08 | 2.2E-08 | 1.967E-08 | OK | 2.72E-10 | |
| Co | 2827 | 1196 | 0.461 | <0.7 | 0.778 | 2.95 | 2.83 | 2.8089E-06 | 3.233E-06 | 3.30E-03 | OK | OK | 2.81E-10 | 3.1E-10 | 3.24E-10 | OK | 6.58E-12 | |
| Hg | 366 | -39 | 0.273 | | 0.014 | 0.39 | 0.05 | 1.006E-06 | 5.4808E-08 | None | OK | OK | 1.0E-10 | 5.0E-12 | 1.006E-10 | | 2.28E-12 | |
| Mn | 1662 | 1248 | 5.761 | 2.2 | 0.584 | 29.73 | 10.20 | 2.2864E-05 | 2.8888E-05 | 3.33E-01 | OK | OK | 2.28E-09 | 2E-09 | 2.286E-09 | OK | 4.70E-11 | |
| Ni | 2916 | 1455 | 19.473 | 10.4 | 0.539 | 38.98 | 31.12 | 4.1980E-05 | 3.4388E-05 | 2.70E-05 | OOS | OOS | 4.2E-09 | 3.4E-09 | 4.198E-09 | OK | 6.73E-11 | |
| Pb | 1700 | 328 | 6.886 | <1.8 | 3.088 | 24.76 | 10.94 | 2.7290E-05 | 1.2887E-05 | None | OK | OK | 2.73E-05 | 1.2E-05 | 2.729E-05 | | 5.68E-11 | |
| Se | 685 | 221 | 16.483 | | 2.803 | 62.79 | 10.19 | 5.8880E-05 | 1.238E-05 | 1.30E-02 | OK | OK | 5.81E-09 | 1.5E-09 | 5.888E-09 | OK | 1.21E-10 | |
| Sb | 1687 | 630 | 0.285 | | 0.179 | 0.76 | 0.65 | 8.2897E-07 | 7.8248E-07 | 3.30E-02 | OK | OK | 8.22E-11 | 7.1E-11 | 8.228E-11 | OK | 1.7E-12 | |
| Tl | 1473 | 304 | 0.189 | | 0.181 | 0.40 | 0.70 | 4.3844E-07 | 7.5727E-07 | 0.067 | OK | OK | 4.38E-11 | 7.7E-11 | 7.573E-11 | OK | 1.60E-12 | |
| V | 2407 | 1989 | 91.889 | 188.8 | 2.882 | 757.45 | 7.51 | 6.3683E-04 | 6.3683E-06 | 0.603 | OK | OK | 6.37E-08 | 6.4E-10 | 6.368E-08 | OK | 1.32E-08 | |
| Zn | 957 | 418 | 88.483 | 77.4 | 25.950 | 292.99 | 94.36 | 3.2283E-04 | 1.0482E-04 | 6.87E-01 | OK | OK | 3.23E-08 | 1E-08 | 3.228E-08 | OK | 6.71E-10 | |
| F | | | | | | | | | | | 0.32E-02 | | 0.167 | | OK | | 6.32E-05 | |
| | | | | | | | | | | | | | Total | 0.06 | 0.06 | 0.06 | | |

Lab Scale Gypsum Sulfur Recovery

Kiln Reduction Reactions

Kiln reduction reactions

| | | | | | | | | |
|---------------------------------|--------|----------------------|-------|-------------------------|------|----------------|--------|--------------|
| CaSO4 + 4H2 --> CaS + 4H2O | 8.06 | pounds H2 react with | 136.2 | pounds CaSO4 to produce | 72.2 | pounds CaS and | 72.06 | pounds water |
| CaSO4 + 4CO --> CaS + 4CO2 | 112.04 | pounds CO react with | 136.2 | pounds CaSO4 to produce | 72.2 | pounds CaS and | 176.04 | pounds CO2 |
| for a 8-lb batch in kiln -----> | 0.47 | pounds H2 react with | 8 | pounds CaSO4 to produce | 4.24 | pounds CaS and | 4.23 | pounds water |
| | 6.58 | pounds CO react with | 8 | pounds CaSO4 to produce | 4.24 | pounds CaS and | 10.94 | pounds CO2 |

Lab Scale Gypsum Sulfur Recovery Project Potential to Emit

Sulfate - Gypsum

| Parameter Emission Unit(s) ID | Value | Units | Source/Basis |
|------------------------------------|-------------|--------|---|
| Potential Production Data | | | |
| Production Factor | 8780 | hr/yr | |
| | 2.92 | TPY | |
| Emission Data & Factors | | | |
| PM Emission Factor | 0.040 | lb/ton | AP-42 Table 11.16-2 (7/93) |
| PM ₁₀ Emission Factor | 0.010 | lb/ton | AP-42 Table 11.16-2 (7/93) |
| PM _{2.5} Emission Factor | 0.0005 | lb/ton | = PM ₁₀ 12% |
| NO _x Emission Factor | NA | | |
| VOC Emission Factor | NA | | |
| SO ₂ Emission Factor | 1.88 | lb/hr | lb so ₂ /batch x 1 batch/2 hr |
| CO Emission Factor | 6.58 | lb/hr | lb CO/batch x 1 batch/2 hr (assume no reaction) |
| CO ₂ Emission Factor | 5.17 | lb/hr | lb CO ₂ /batch x 1 batch/2 hr |
| F Emission Factor | 0.08 | lb/hr | lb F/batch x 1 batch/2 hr |
| Pb Emission Factor | 2.72328E-05 | lb/hr | Calculated based on concentration in gypsum |
| Hg Emission Factor | 1.10E-10 | lb/hr | Calculated based on concentration in gypsum |

| | | | |
|--------------------------------------|----------|-----|-------------------------|
| Annual Emissions Calculations | | | |
| PM Potential to Emit | 5.84E-05 | TPY | = PF x EF / 2000 lb/ton |
| PM ₁₀ Potential to Emit | 1.46E-05 | TPY | = PF x EF / 2000 lb/ton |
| PM _{2.5} Potential to Emit | 7.38E-07 | TPY | = PF x EF / 2000 lb/ton |
| NO _x Potential to Emit | NA | TPY | = PF x EF / 2000 lb/ton |
| VOC Potential to Emit | NA | | |
| SO ₂ Potential to Emit | 8.25 | TPY | = PF x EF / 2000 lb/ton |
| CO Potential to Emit | 28.82 | TPY | = PF x EF / 2000 lb/ton |
| CO ₂ Potential to Emit | 22.84 | TPY | = PF x EF / 2000 lb/ton |
| F Potential to Emit | 0.28 | TPY | = PF x EF / 2000 lb/ton |
| Pb Potential to Emit | 1.20E-06 | TPY | = PF x EF / 2000 lb/ton |
| Hg Potential to Emit | 4.80E-10 | TPY | = PF x EF / 2000 lb/ton |

Summary of Results

| Potential Annual Emissions per Year | | | | | | | | | | |
|-------------------------------------|------------------|-------------------|-----------------|-----|-----------------|-------|-----------------|------|----------|----------|
| PM | PM ₁₀ | PM _{2.5} | NO _x | VOC | SO ₂ | CO | CO ₂ | F- | Pb | Hg |
| 5.84E-05 | 1.46E-05 | 7.38E-07 | NA | NA | 8.25 | 28.82 | 22.84 | 0.28 | 1.20E-06 | 4.80E-10 |

Lab Scale Gypsum Sulfur Recovery Project Design Emissions

Sulfate - Gypsum

| Parameter Emission Units/D | Value | Units | Source/Bests | | |
|---|------------|--------|---|-----------|----------|
| Project Design Production Data | | | | | |
| Production Factor | = 1300 | hr/yr | Project Design | | |
| | 2.6 | TPY | | | |
| Baseline Emission Data & Factors | | | | | |
| PM Emission Factor | = 0.04 | lb/ton | AP-42 Table 11.18-2 (7/93) | 6.92E-04 | ▼ |
| PM ₁₀ Emission Factor | = 0.01 | lb/ton | AP-42 Table 11.18-2 (7/93) | 2.08E-04 | ▼ |
| PM _{2.5} Emission Factor | = 5.05E-04 | lb/ton | = PM ₁₀ 12% | 1.05E-05 | ▼ |
| NO _x Emission Factor | = NA | | | | |
| VOC Emission Factor | = NA | | | | |
| SO ₂ Emission Factor | = 1.88 | lb/hr | | 1.88E-03 | |
| CO Emission Factor | = 8.58 | lb/hr | lb CO/batch * 1 batch/2 hr (assume no reaction) | | |
| CO ₂ Emission Factor | = 5.17 | lb/hr | lb CO ₂ /batch * 1 batch/2 hr | | |
| F Emission Factor | = 8.32E-02 | lb/hr | lb F/batch * 1 batch/2 hr | 6.316E-05 | 5.97E-05 |
| Pb Emission Factor | = 2.73E-09 | lb/hr | Calculated based on concentration in gypsum | 5.64E-11 | 9.08E-09 |
| Hg Emission Factor | = 1.10E-10 | lb/hr | Calculated based on concentration in gypsum | 2.29E-12 | ▼ |
| Annual Emissions Calculations | | | | | |
| PM Project Design | = 1.08E-08 | TPY | = (1-CE/100) * PF * EF / 2000 lb/ton | 1.68E-08 | PPH |
| PM ₁₀ Project Design | = 2.70E-07 | TPY | = (1-CE/100) * PF * EF / 2000 lb/ton | 4.16E-07 | PPH |
| PM _{2.5} Project Design | = 1.37E-08 | TPY | = (1-CE/100) * PF * EF / 2000 lb/ton | 2.10E-08 | PPH |
| NO _x Project Design | = NA | | | | |
| VOC Project Design | = NA | | | | |
| SO ₂ Project Design | = 1.22E-03 | TPY | = (1-CE/100) * PF * EF / 2000 lb/ton | | |
| CO Project Design | = 0.01 | TPY | = PF * EF / 2000 lb/ton | | |
| CO ₂ Project Design | = 0.01 | TPY | = PF * EF / 2000 lb/ton | | |
| F Project Design | = 4.1E-05 | TPY | = (1-CE/100) * PF * EF / 2000 lb/ton | | |
| Pb Project Design | = 1.78E-09 | TPY | = (1-CE/100) * PF * EF / 2000 lb/ton | | |
| Hg Project Design | = 7.05E-11 | TPY | = (1-CE/100) * PF * EF / 2000 lb/ton | | |

Summary of Results

| Project Design Emissions per year | | | | | | | | | | | |
|-----------------------------------|------------------|-------------------|-----------------|-----|-----------------|----------|-----------------|---------|----------|----------|--|
| PM | PM ₁₀ | PM _{2.5} | NO _x | VOC | SO ₂ | CO | CO ₂ | F | Pb | Hg | |
| 1.08E-08 | 2.70E-07 | 1.37E-08 | NA | NA | 1.22E-03 | 8.58E-03 | 8.72E-03 | 4.1E-05 | 1.78E-09 | 7.05E-11 | |

APPENDIX B – FACILITY DRAFT COMMENTS

The following comments were received from the facility on May 28, 2014:

Facility Comment: Permit - Table 1.1 refers to a "Kiln Baghouse w/Bubblers." To clarify, the bubblers are simply laboratory equipment containing a caustic solution. The exhaust stream passes through the solution before capture by the baghouse. A pH probe will ensure that the pH does not drop below 7 to ensure adequate removal of SO₂ when recovering sulfur from gypsum. Bubblers will not be used when beneficiating phosphate ore.

DEQ Response: The requested clarification will be made in the permit.

Facility Comment: Permit - Several references throughout the permit refer to "phosphogypsum ore." Please change this to "phosphogypsum."

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

Facility Comment: Permit - References to 4-inch kiln (found in Table 1.1 page 3) should be changed to 6-inch kiln. The kiln is a 6-inch kiln rather than a 60-inch kiln (Section 2.1 page 4).

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

Facility Comment: Permit - In section 2.6, Simplot requested a change to the permit requiring the baghouse be in operation when the kiln is beneficiating phosphate ore or when the kiln is used to recover sulfur from phosphogypsum. Other research may involve use of the kiln, and in some cases, there may be no need for abatement.

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

Facility Comment: Permit - Also in section 2.6, there is a reference to baghouse bubblers and beneficiation of phosphogypsum. Phosphogypsum will not be beneficiated, and the baghouse is separate from the bubblers.

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

Facility Comment: Permit - This project is regulated by 40 CFR 61.205 which specifies other applicable sections in the rule - 61.208 and 61.209(c). Other requirements in 40 CFR 60 Subpart R appropriately can be found in the Don Plant's Title V Permit. 40 CFR 61.205 (a) requires the gypsum stack owner/operator (Simplot's Don Plant) to obtain written confirmation from the research facility (Simplot's EMT facility) that it will comply with all the requirements in paragraph (b).

Gypsum stack owner/operator obligations do not apply to research and development. To clarify, page 9 of our application stated that "gypsum will be produced, stored, and managed at the EMT building". This was a poor choice of words. The gypsum will be produced as a result of manufacturing wet phosphoric acid at the Don Plant. Wastes which may contain gypsum will be generated at the EMT building; however, Resource Conservation and Recovery Act Rules do not allow EMT waste materials to be placed in a gypsum stack. Wastes generated by this project will be properly characterized and managed.

DEQ Response: The clarification has been noted.

Facility Comment: Permit - Sections 2.7 & 2.8 do not apply to this facility or project because it applies to the stack and the owner/operator of a stack.

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

Facility Comment: Permit - Section 2.9 does not apply to this facility or project because the project does not involve outdoor agricultural purposes.

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

Facility Comment: Permit - Section 2.10 references 40 CFR 61.205 (a) which is partially applicable as explained above.

DEQ Response: Permit Condition 2.10 (now Permit Condition 2.7) was left in the permit.

Facility Comment: Permit - Radium Sampling and Measurement Procedures in Section 2.12 apply at the stack and do not apply to indoor research activities.

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

Facility Comment: Permit - Requirements found in Section 2.13 apply to the owner/operator of a stack. The EMT facility will be a recipient of the certification, but the burden of preparing the document appropriately belongs to the stack owner/operator.

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

Facility Comment: Permit - Section 2.16 requires the facility to keep a record of the "manufacturer's recommendation for baghouse operations with bubblers." No document of this type exists. Simplot has the baghouse manufacturer recommendations, but the bubblers are made up of standard laboratory equipment. Simplot will monitor the pH in the bubblers to ensure that control efficiency is maintained.

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

Facility Comment: Permit - Sections 2.17, 2.18, and 2.20 include references 40 CFR 61.209(a), (b), and (d), respectively. As explained above, 61.209(c) is the applicable requirement for indoor research in Section 61.209.

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

Facility Comment: Statement of Basis - Simplot could not find a narrative on the Sulfur Recovery Project in the Description.

DEQ Response: The sulfur recovery process will be added to the description.

Facility Comment: Statement of Basis - Please change references to "phosphogypsum ore" to "phosphogypsum."

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

Facility Comment: Statement of Basis - In the application scope, please modify as follows: "Modify the permit for the beneficiation operation to allow the processing of phosphogypsum in addition to phosphate ore."

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

Facility Comment: Statement of Basis - Table 1 refers to a "Kiln Baghouse w/Bubblers." To clarify, the bubblers are laboratory equipment containing a caustic solution which the exhaust stream passes through before capture by the baghouse. A pH probe will ensure that the pH does not drop below 7 to ensure adequate removal of SO₂.

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

Facility Comment: Statement of Basis - Table 1 references a 4- Laboratory Rotary Bench Kiln. Simplot's kiln is 6 inches.

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

Facility Comment: Statement of Basis - On page 11, the NESHAP applicability section should be modified to identify not applicable requirements as such or to exclude non-applicable requirements.

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

Facility Comment: Statement of Basis - On page 17, "baghouse bubblers" should be "bubblers" in the Permit Scope section. Under the Kiln section, there are no manufacturer recommendations for operation of the baghouse when the bubbler system is operating since the bubbler system is a compilation of standard laboratory equipment.

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

APPENDIX C – 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. - EMT
Address: 1130 Highway 30 West
City: Pocatello
State: ID
Zip Code: 83204
Facility Contact: Chelly Reesman
Title: Environmental Engineer
AIRS No.: 005-00088

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) |
| NOX | 0.0 | 0 | 0.0 |
| SO2 | 0.0 | 0 | 0.0 |
| CO | 0.0 | 0 | 0.0 |
| PM10 | 0.0 | 0 | 0.0 |
| VOC | 0.0 | 0 | 0.0 |
| TAPS/HAPS | 0.0 | 0 | 0.0 |
| Total: | 0.0 | 0 | 0.0 |
| Fee Due | \$1,000.00 | | |

Comments:

