Statement of Basis

Permit to Construct No. P-2013.0001
Project ID 61142

Nu-West Industries, Inc.
dba Nu-West Conda Phosphate Operations
Soda Springs, Idaho

Facility ID 029-00003

Final

May 20, 2013 KW
Kelli Wetzel
Permit Writer

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

ACRONYMS, UNITS, AND CHEMICAL NOMENCLATURE

AAC	acceptable ambient concentrations
AACC	acceptable ambient concentrations for carcinogens
acfm	actual cubic feet per minute
ASTM	American Society for Testing and Materials
Btu	British thermal units
CAA	Clean Air Act
CAM	Compliance Assurance Monitoring
cfm	cubic feet per minute
CFR	Code of Federal Regulations
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	CO_2 equivalent emissions
DEQ	Department of Environmental Quality
dscf	dry standard cubic feet
EL	screening emission levels
EPA	U.S. Environmental Protection Agency
GHG	greenhouse gases
gr	grains (1 lb = 7,000 grains)
HAP	hazardous air pollutants
hr/yr	hours per consecutive 12 calendar month period
IDAPA	a numbering designation for all administrative rules in Idaho promulgated in accordance with the Idaho Administrative Procedures Act
lb/hr	pounds per hour
m	meters
MACT	Maximum Achievable Control Technology
MMBtu	million British thermal units
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_2	oxygen
PAH	polyaromatic hydrocarbons
PC	permit condition
PM	particulate matter
$PM_{2.5}$	particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers
PM_{10}	particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers
POM	polycyclic organic matter
ppm	parts per million
PSD	Prevention of Significant Deterioration
PTC	permit to construct
PTE	potential to emit
Rules	*Rules for the Control of Air Pollution in Idaho*
scf	standard cubic feet
SCL	significant contribution limits
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
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

The Nu-West Industries, Inc., Nu-West Conda Phosphate Operations (Nu-West) facility located near Soda Springs produces phosphate fertilizers from ore. Phosphate fertilizers provide phosphorus, one of the three primary plant nutrients required by plant life. The other two primary nutrients are nitrogen and potassium. Phosphate fertilizer products, which are often made with ammonia, also provide nitrogen. The principal applications of phosphate fertilizers are in the production of corn, wheat, soybeans, barley, cotton, and other small grain crops, fruits, and vegetables. Phosphate rock, sulfur, and anhydrous ammonia are the primary raw materials used to produce ammonium phosphate fertilizers. Phosphate rock is combined with sulfuric acid to produce phosphoric acid, which is then either:

- Combined with anhydrous ammonia to produce various dry granular fertilizers that are differentiated by their NPK content (% nitrogen -% phosphorus -% potassium), including MAP (11-52-0) and APS (16 20 0), or
- Concentrated to produce liquid fertilizer products containing no nitrogen and 52%-72% P_2O_5.

The facility produces multiple products and alters its product mix to meet the changing requirements of its customers. This includes the following: Super Phosphoric Acid (SPA); Merchant Grade Acid (MGA); Dilute Phosphoric Acid (DPA); and dry granular products including Mono-ammonium Phosphate ("MAP" or 11-52-0) and Ammonium Phosphate Sulfate ("APS" or 16-20-0).

The facility is proposing to install an additional SPA evaporation system which will increase total SPA throughput by approximately 24.5%. The existing two SPA evaporation systems take a feed of approximately 50-60% by weight P_2O_5 and evaporate additional water to concentrate the P_2O_5 to 68-70% by weight. With the installation of an additional SPA evaporation system, the facility will install a new Therminol heating system which consists of a natural gas-fired heater equipped with low-NO_x burners, combustion air blower, circulation pump, expansion tank, storage tank, and fill pump. In addition, a new two-stage Steam Ejector system, two new barometric condensers and new seal tank will be installed to create a vacuum in the evaporator. No physical modifications will be made to the existing SPA scrubber system, PPA cooling tower, Nebraska boiler (B-5), SPA oxidation reactor, aging system, and the filtration press and loading system.

Application Scope

This PTC is for a modification at an existing Tier I facility. See the current Tier I permit statement of basis for the permitting history.

The applicant has proposed to:

- Install and operate a new #3 SPA evaporation system train
- Install and operate a new Therminol 55 circulation system with heater to provide the heat media necessary for the increase SPA production.

Application Chronology

January 7, 2013	DEQ received an application and an application fee.
January 17 – February 1, 2013	DEQ provided an opportunity to request a public comment period on the application and proposed permitting action.
February 6, 2013	DEQ determined that the application was complete.
March 18, 2013	DEQ received supplemental information from the applicant.

March 18, 2013	DEQ made available the draft permit and statement of basis for peer and regional office review.
March 25, 2013	DEQ made available the draft permit and statement of basis for applicant review.
April 11 – May 13, 2013	DEQ provided a public comment period on the proposed action.
April 19, 2013	DEQ received the permit processing fee.
May 20, 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.
S-Pb-1	<u>Superphosphoric Acid Process (SPA #3):</u> Manufacturer: TBD Model: TBD Max. capacity: 336 T/day equivalent P_2O_5 feed	Existing multi-stage horizontal cross flow scrubber (A-Pb-1)	For emission point parameters see DEQ's modeling memo for this project (Appendix B).
No. 3 SPA Therminol Heater	<u>Therminol Heater:</u> Manufacturer: TBD Model: TBD Heat input rating: 25.55 MMBtu/hr Fuel: Natural gas	Low NO_x burner	

Emissions Inventories

Emission inventories provided in the application included emissions of federally regulated criteria pollutants and greenhouse gases, and state-regulated toxic air pollutants (TAP).

Summaries of these emission inventories are provided below and in Appendix A.

Nu-West is defined as a major facility for purposes of the Title V Program in accordance with IDAPA 58.01.01.008.10, because it emits or has the potential to emit (PTE) a regulated air pollutant in amounts greater than or equal to major facility thresholds listed in Subsection 008.10. The facility has a PTE for SO_2 and NO_x of over 100 T/yr for each pollutant. A PSD applicability analysis is required for this project.

<u>Projected Actual Emissions</u>

The procedure used by Nu-West for calculating projected actual emissions was the calculation approach for both the new and existing units set forth in 40 CFR 52.21, beginning with definitions in 52.21(b)(41). Using these procedures, projected actual criteria pollutant emissions were calculated. Projected actual emissions are presented in the following table:

Table 2 PROJECTED ACTUAL EMISSIONS

Source	$PM_{10}/PM_{2.5}$ T/yr	SO_2 T/yr	NO_x T/yr	CO T/yr	VOC T/yr	Lead T/yr	Fluoride T/yr	CO_2e T/yr
Point Sources Affected by this Permitting Action								
No. 3 SPA Therminol Heater	0.8	0.066	5.5	9.2	0.6	5.5E-05	0.0	13192.83
Nebraska Boiler (B-5)	3.09	0.333	40.69	34.80	0.737	2.78E-04	0.0	69267
SPA Scrubber	2.37	0.0	0.0	0.0	0.0	0.0	0.82	0.0
SPA Oxidation Reactor	0.0	0.0	1.07	16.7	0.0	0.0	0.0	0.0
Cooling Tower	3.29	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total, Projected Actual Emissions	**9.55**	**0.40**	**47.26**	**60.7**	**1.34**	**3.3E-04**	**0.82**	**82457**

Baseline Actual Emissions

The procedure used by Nu-West for calculating baseline actual emissions was the calculation approach for the existing units set forth in 40 CFR 52.21, beginning with definitions in 52.21(b)(41). Using these procedures, baseline actual criteria pollutant emissions were calculated. Baseline actual emissions are presented in the following table:

Table 3 BASELINE ACTUAL EMISSIONS[a]

Source	$PM_{10}/PM_{2.5}$ T/yr	SO_2 T/yr	NO_x T/yr	CO T/yr	VOC T/yr	Lead T/yr	Fluoride T/yr	CO_2e T/yr
Point Sources Affected by this Permitting Action								
Nebraska Boiler (B-5)	3.07	0.33	40.39	34.60	0.73	2.76E-04	0.0	68747
SPA Scrubber	1.07	0.0	0.0	0.0	0.0	0.0	0.32	0.0
SPA Oxidation Reactor	0.0	0.0	0.57	9.10	0.0	0.0	0.0	0.0
Cooling Tower	3.09	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total, Baseline Actual Emissions	**7.23**	**0.33**	**40.96**	**43.70**	**0.73**	**2.76E-04**	**0.32**	**68747**

a) Annual average emissions for calendar years 2006 and 2007 except $PM_{10}/PM_{2.5}$. Annual average emissions for $PM_{10}/PM_{2.5}$ are from calendar years 2007 and 2008.

Project Emissions Increase

The project emissions increase is presented in the following table:

Table 4 PROJECT EMISSIONS INCREASE

Emissions	$PM_{10}/PM_{2.5}$ T/yr	SO_2 T/yr	NO_x T/yr	CO T/yr	VOC T/yr	Lead T/yr	Fluoride T/yr	CO_2e T/yr
Point Sources								
Projected Actual Emissions	9.55	0.40	47.26	60.70	1.34	3.3E-04	0.82	82457
Baseline Actual Emissions	7.23	0.33	40.96	43.70	0.73	2.76E-04	0.32	68747
Project Emissions Increase	**2.32**	**0.07**	**6.30**	**17.00**	**0.61**	**5.7E-05**	**0.50**	**13710**

Comparison of the Project Emissions Increase to the PSD Significance Thresholds

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

Table 5 COMPARISON OF THE PROJECT EMISSIONS INCREASE TO THE PSD MAJOR MODIFICATION THRESHOLDS

Emissions	$PM_{10}/PM_{2.5}$[a] T/yr	SO_2 T/yr	NO_x T/yr	CO T/yr	VOC T/yr	Lead T/yr	Fluoride T/yr	CO_2e T/yr
	Point Sources							
Project Emissions Increase	2.32	0.07	6.30	17.00	0.61	5.7E-05	0.50	13710
PSD Significance Threshold	15	40	40	100	40	0.6	3	75,000
Does the Project Emissions Increase Exceed the PSD Major Modification Threshold?	No	No	No	No	No	No	No	No

a) PM_{10} and $PM_{2.5}$ were evaluated as one pollutant. The major modification threshold for $PM_{2.5}$ is 10 TPY. The project emissions increase is below 10 TPY and therefore $PM_{2.5}$ is below the threshold.

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

Non-Carcinogenic TAP Emissions

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[a] (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)
Barium	0.00E-03	1.15E-04	1.15E-04	0.033	No
Chromium	0.00E-03	3.65E-05	3.65E-05	0.033	No
Cobalt	0.00E-03	2.19E-06	2.19E-06	0.0033	No
Copper	0.00E-03	2.21E-05	2.21E-05	0.013	No
Manganese	0.00E-03	9.89E-06	9.89E-06	0.067	No
Molybednum	0.00E-03	2.86E-05	2.86E-05	0.333	No
Naphthalene	0.00E-03	1.59E-05	1.59E-05	3.33	No
n-Hexane	0.00E-03	4.69E-02	4.69E-02	12	No
Selenium	0.00E-03	6.25E-07	6.25E-07	0.013	No
Toluene	0.00E-03	8.85E-05	8.85E-05	25	No
Vanadium	0.00E-03	5.99E-05	5.99E-05	0.003	No
Zinc	0.00E-03	7.55E-04	7.55E-04	0.667	No

a) Incremental emissions were included from the existing Nebraska boiler. Therefore, pre-project emissions rates are set to zero.

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)[a]	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	0.00E-03	6.25E-07	6.25E-07	9.10E-05	No
3-Methylchloranthrene	0.00E-03	4.69E-08	4.69E-08	2.50E-06	No
7,12-Dimethylbenz(a)anthracene	0.00E-03	4.17E-07	4.17E-07	9.10E-05	No
Acenaphthene	0.00E-03	4.69E-08	4.69E-08	9.10E-05	No
Acenaphthylene	0.00E-03	4.69E-08	4.69E-08	9.10E-05	No
Anthracene	0.00E-03	6.25E-08	6.25E-08	9.10E-05	No
Arsenic	0.00E-03	5.21E-06	5.21E-06	1.50E-06	Yes
Benz(a)anthracene	0.00E-03	4.69E-08	4.69E-08	2.00E-06	No
Benzene	0.00E-03	5.47E-05	5.47E-05	8.00E-04	No
Benzo(a)pyrene	0.00E-03	3.12E-08	3.12E-08	2.00E-06	No
Benzo(b)fluoranthene	0.00E-03	4.69E-08	4.69E-08	2.00E-06	No
Benzo(g,h,i)perylene	0.00E-03	3.12E-08	3.12E-08	9.10E-05	No
Benzo(k)fluoranthene	0.00E-03	4.69E-08	4.69E-08	2.00E-06	No
Beryllium	0.00E-03	3.12E-07	3.12E-07	2.80E-05	No
Cadmium	0.00E-03	2.86E-05	2.86E-05	3.70E-06	Yes
Chrysene	0.00E-03	4.69E-08	4.69E-08	2.00E-06	No
Dibenzo(a,h)anthracene	0.00E-03	3.12E-08	3.12E-08	2.00E-06	No
Dichlorobenzene	0.00E-03	3.12E-05	3.12E-05	---	No
Fluoranthene	0.00E-03	7.81E-08	7.81E-08	9.10E-05	No
Fluorene		7.29E-08	7.29E-08	9.10E-05	No
Formaldehyde	0.00E-03	1.95E-03	1.95E-03	5.10E-04	Yes
Indeno(1,2,3-cd)pyrene	0.00E-03	4.69E-08	4.69E-08	2.00E-06	No
Nickel	0.00E-03	5.47E-05	5.47E-05	2.70E-05	Yes
PAH[b]	0.00E-03	2.97E-07	2.97E-07	2.00E-06	No
Phenanathrene	0.00E-03	4.43E-07	4.43E-07	9.10E-05	No
Pyrene	0.00E-03	1.30E-07	1.30E-07	9.10E-05	No

a) Incremental emissions were included from the existing Nebraska boiler. Therefore, pre-project emissions rates are set to zero.
b) Polynuclear Aromatic Hydrocarbons (PAH) is considered as one TAP comprised of: benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo (g,h.l)perylene, dibenzo(a,h)anthracene, chrysene, indeno(1,2,3-cd)pyrene, benzo(a)pyrene.

Some of the PTEs for carcinogenic TAP were exceeded as a result of this project. Therefore, modeling is required for arsenic, cadmium, formaldehyde, and nickel because the annual average carcinogenic screening ELs identified in IDAPA 58.01.01.586 were exceeded.

Ambient Air Quality Impact Analyses

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

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

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

Permit to Construct (IDAPA 58.01.01.201)

IDAPA 58.01.01.201 ....Permit to Construct Required

The permittee has requested that a PTC be issued to the facility for the proposed new emissions source. 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.

Standards for New Sources (IDAPA 58.01.01.676)

IDAPA 58.01.01.676 ....Standards for New Sources

The fuel burning equipment located at this facility, with a maximum rated input of ten (10) million BTU per hour or more, are subject to a particulate matter limitation of 0.015 gr/dscf of effluent gas corrected to 3% oxygen by volume when combusting gaseous fuels. Fuel-Burning Equipment is defined as any furnace, boiler, apparatus, stack and all appurtenances thereto, used in the process of burning fuel for the primary purpose of producing heat or power by indirect heat transfer. This requirement is assured by Permit Condition 2.4.

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

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

Nu-West is defined as a major facility for purposes of the Title V Program in accordance with IDAPA 58.01.01.008.10, because it emits or has the potential to emit (PTE) a regulated air pollutant in amounts greater than or equal to major facility thresholds listed in Subsection 008.10. The facility has a PTE for SO_2 and NO_x of over 100 T/yr for each pollutant.

PSD Classification (40 CFR 52.21)

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

This facility is a designated facility as defined by IDAPA 58.01.01.006.30. and 58.01.01.205 [40 CFR 52.21(a)] (sulfuric acid plant). Since the facility is a designated facility, the PSD applicability threshold is 100 TPY. This facility is a major facility as defined for the PSD program by IDAPA 58.01.01.205 [40 CFR 52.21(b)] because it emits or has the potential to emit a regulated criteria air pollutant (SO_2 and NOx) in amounts greater than or equal to 100 tons per year.

Because Nu-West is an existing PSD major facility, any project that entails a physical or operational change to that facility is subject to the PSD applicability procedures specified at 40 CFR.52.21(a)(2) in order to determine if the change triggers the PSD requirements.

The PSD applicability determination process involves a two part test. The first step test is to determine if the project itself would cause a significant emission increase. The second step test is only conducted if the first step test shows that the project itself causes a significant increase. The second step test is to determine if the project would also cause a significant net emission increase.

The first step test for modifications to existing emissions units is conducted in accordance with the procedures specified at 40 CFR 52.21(a)(2)(iv)(Actual to projected actual test for projects that only involve existing and new emission units). This is the appropriate test because the changes are to components of the existing SPA process. The existing SPA process is not being entirely replaced and is not considered a new emission unit for purposes of the PSD applicably tests. A significant emissions increase of a regulated NSR pollutant is projected to occur if the sum of the difference between the projected actual emissions and the baseline actual emissions, for each existing emissions unit, equals or exceeds the significant amount for that pollutant.

Baseline actual emissions means the average rate, in tons per year, at which the emissions unit actually emitted the pollutant during any consecutive 24-month period selected by the owner or operator within the 10-year period immediately preceding either the date the owner or operator begins actual construction of the project, or the date a complete permit application is received (40 CFR 52.21(b)(48)). Nu-West calculated baseline actual emissions as the annual average emissions for calendar year 2006 and 2007 for all pollutants except $PM_{10}/PM_{2.5}$. Nu-West calculated baseline actual emissions as the annual average emission for calendar years 2007 and 2008 for $PM_{10}/PM_{2.5}$. See the emission inventories section of this Statement of Basis for more details.

Projected actual emissions is the maximum annual rate, in tons per year, at which an existing emissions unit is projected to emit a regulated NSR pollutant in any one of the 5 years (12-month period) following the date the unit resumes regular operation after the project, or in any one of the 10 years following that date if the project involves increasing the emissions unit's design capacity. In lieu of using the method described, the applicant may elect to use the emissions unit's potential to emit, in tons per year (40 CFR 52.21(b)(41)(ii)(d)). Nu-West has elected to use the potential to emit for all pollutants associated with the Therminol Heater, SPA Oxidation Reactor, and SPA Scrubber. Nu-West elected to use incremental projected use emissions for the Nebraska Boiler and Cooling Tower. Nu-West's emissions for the SPA evaporation system project are listed in Table 2 of this Statement of Basis.

The first step of the PSD applicability analysis for Nu-West is summarized in Table 5 of this Statement of Basis. The analysis shows that the project will not cause a significant emission increase and therefore the second step test is not warranted.

NSPS Applicability (40 CFR 60)

In accordance with 40 CFR 63.610, since the Phosphoric Acid Plant and Superphosphoric Acid Plant are affected sources subject to the provisions of 40 CFR 63 Subpart AA, they are exempted from any otherwise applicable new source performance standard contained in 40 CFR Part 60, Subpart T, Subpart U or Subpart NN. To be exempt, a source must have a current operating permit pursuant to Title V of the Act and the source must be in compliance with all requirements of this subpart.

The Nebraska B-5 boiler is subject to 40 CFR 60, Subpart Db and is unaffected by the current project. See permit number T1-060308 amended on January 12, 2012 for a breakdown of Subpart Db.

NESHAP Applicability (40 CFR 61)

This project does not have any effect on NESHAP requirements.

MACT Applicability (40 CFR 63)

The facility is subject to 40 CFR 63 Subpart AA, National Emission Standards for Hazardous Air Pollutants from Phosphoric Acid Manufacturing Plants. 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:

- 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;
- Each evaporative cooling tower at a phosphoric acid manufacturing plant;
- Each phosphate rock dryer located at a phosphoric acid manufacturing plant;
- Each phosphate rock calciner located at a phosphoric acid manufacturing plant;
- Each superphosphoric acid process line. The requirements of this subpart apply to the following emission points which are components of a superphosphoric acid process line: evaporators, hot wells, acid sumps, and cooling tanks; and
- Each purified acid process line. These requirements do not apply since Nu-West no longer produces purified phosphoric acid.

This project has no impact on Nu-West's MACT applicability. Nu-West is currently subject to 40 CFR 63 Subpart AA and the permit conditions pertaining to Subpart AA have been carried over from the Tier I Operating Permit and duplicated in this PTC.

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.

Initial Permit Conditions 2.1 and 2.2

These permit conditions provide a description of the process, regulated sources and the control devices in use for the No. 3 SPA evaporation system.

Initial Permit Conditions 2.3, 2.5, 2.7 – 2.8, and 2.10 – 2.25

These permit conditions have been carried over and duplicated from P-2009.0068 and the current Tier I Operating Permit as they apply to the superphosphoric acid line. These permit conditions identify the MACT standards and NO_x emission limits under which the superphosphoric acid line operates.

Initial Permit Condition 2.4

This permit condition establishes the particulate matter emission limitation in accordance with IDAPA 58.01.01.676-677. Compliance with this requirement is demonstrated by complying with the requirement to combust only natural gas in the Therminol heater.

Initial Permit Condition 2.6

This permit condition requires that the Therminol heater shall only combust natural gas. This requirement was placed in the permit because emission estimates presented in the compliance demonstration in the permit application are based upon using exclusively natural gas.

Initial Permit Condition 2.9

This permit condition clarifies that in the event there is a conflict between a permit condition and a Federal rule, it is the Federal rule that shall apply.

Initial Permit Condition 3.1

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

Initial Permit Condition 3.2

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

Initial Permit Condition 3.3

The obligation to comply general compliance provision specifies that no permit condition is intended to relieve or exempt the permittee from compliance with applicable state and federal requirements, in accordance with IDAPA 58.01.01.212.01.

Initial Permit Condition 3.4

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

Initial Permit Condition 3.5

The permit expiration construction and operation provision specifies that the permit expires if construction has not begun within two years of permit issuance or if construction has been suspended for a year in accordance with IDAPA 58.01.01.211.02.

Initial Permit Condition 3.6

The notification of construction and operation provision requires that the permittee notify DEQ of the dates of construction and operation, in accordance with IDAPA 58.01.01.211.03.

Initial Permit Condition 3.7

The performance testing notification of intent provision requires that the permittee notify DEQ at least 15 days prior to any performance test to provide DEQ the option to have an observer present, in accordance with IDAPA 58.01.01.157.03.

Initial Permit Condition 3.8

The performance test protocol provision requires that any performance testing be conducted in accordance with the procedures of IDAPA 58.01.01.157, and encourages the permittee to submit a protocol to DEQ for approval prior to testing.

Initial Permit Condition 3.9

The performance test report provision requires that the permittee report any performance test results to DEQ within 30 days of completion, in accordance with IDAPA 58.01.01.157.04-05.

Initial Permit Condition 3.10

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

Initial Permit Condition 3.11

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

Initial Permit Condition 3.12

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

Initial Permit Condition 3.13

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

Initial Permit Condition 3.14

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

Initial Permit Condition 3.15

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

Initial Permit Condition 3.16

The severability provision specifies that permit conditions are severable, in accordance with IDAPA 58.01.01.211.

PUBLIC REVIEW

Public Comment Opportunity

An opportunity for public comment period on the application was provided in accordance with IDAPA 58.01.01.209.01.c or IDAPA 58.01.01.404.01.c. During this time, there were no comments on the application and there was a request for a public comment period on DEQ's proposed action. Refer to the chronology for public comment opportunity dates.

Public Comment Period

A public comment period is being made available to the public in accordance with IDAPA 58.01.01.209.01.c. During this time, comments were not submitted in response to DEQ's proposed action. Refer to the chronology for public comment period dates.

APPENDIX A – EMISSIONS INVENTORIES

Nu-West Conda Phosphate Operations

Permit Section 6: Superphosphoric Acid Process

Permit Section		Units	Permit Limit	Existing SPA (from stack tests resulting in maximum emissions)	Additional #3 SPA Estimated
	50-58% P_2O_5 Acid Feed	gpm	*none*	131.528	62
	Specific Gravity	none	*none*	1.8118	1.71
	50-58% P_2O_5 Acid Feed	lb/hr	*none*	119,247	52,881
	50-58% P_2O_5 Acid Feed	tons/day	*none*	1,431	635
	Equivalent P_2O_5 Feed	wt%	*none*	59.21	53.00
	Equivalent P_2O_5 Feed	lb/hr	*none*	70,608	28,027
	Equivalent P_2O_5 Feed	tons/day	*none*	847	336
	Equivalent P_2O_5 Feed	tons/hr	*none*	35.3	14
	Equivalent P_2O_5 Feed	tons/year	*560000*	309,264	122,759
6.4	SPA Oxidation NO_x emissions	ppm	*none*	23.0	9.130
6.4	SPA Oxidation NO_x emissions*	lb/hr	*none*	0.137	0.054
6.4	SPA Oxidation NO_x emissions	tons/12 consecutive months	5	0.60	0.24
	SPA Oxidation CO emissions	ppm	*none*	600.4	238.3
	SPA Oxidation CO emissions*	lb/hr	*none*	2.175	0.863

* Calculated with formula from Source Test Report (12-4-2008, NOx and CO Performance Tests Conducted on the HNO_3 Oxidizer Exhaust

Increased NOx and CO from SPA scrubber due to the addition of SPA#3 calculated from NOx and CO emission measurements from 2008 source test, prorating to maximum P2O5 capacity of SPA#3 assuming average P2O5 feed rate from other 2007, 2009, 2010, 2011, and 2012 source tests (as corresponding feed rate during the source test was not available).

Burner TAC Emissions

	SPA #3
Fuel	Natural Gas (NG)
High Heating Value of NG (btu/scf)	1020
Heat Input Rating (Mmbtu/hr)	1.01
Steam Capacity (lb/hr)	824
Operating Time (hours/year)	8760
Operating Time (hours/day)	24
Load Factor	1

CAS Number	Pollutant	Emission Factor[1]		SPA #3 Emissions		Screening Emissions Levels (EL)		Modeling Required
		Emissin Factor (lb/MMscf)	Emissin Factor (lb/MMBtu)	Hourly (lb/hr)	Annual (lb/year)	Non Carcinogenic (lb/hr)	Carcinogenic (lb/hr)	Yes/No
91-57-6	2-Methylnaphthalene[2]	2.40E-05	2.35E-08	2.37E-08	2.07E-04	—	9.10E-05	No
56-49-5	3-Methylchloranthrene[2]	1.80E-06	1.76E-09	1.78E-09	1.56E-05	—	2.50E-06	No
57-97-6	7,12-Dimethylbenz(a)anthracene[2]	1.60E-05	1.57E-08	1.58E-08	1.38E-04	—	9.10E-05	No
83-32-9	Acenaphthene[2]	1.80E-06	1.76E-09	1.78E-09	1.56E-05	—	9.10E-05	No
208-96-8	Acenaphthylene[2]	1.80E-06	1.76E-09	1.78E-09	1.56E-05	—	9.10E-05	No
120-12-7	Anthracene[2]	2.40E-06	2.35E-09	2.37E-09	2.07E-05	—	9.10E-05	No
56-55-3	Benz(a)anthracene[2,3]	1.80E-06	1.76E-09	1.78E-09	1.56E-05	—	2.00E-06	No
71-43-2	Benzene	2.10E-03	2.06E-06	2.07E-06	1.82E-02	—	8.00E-04	No
50-32-8	Benzo(a)pyrene[2,3]	1.20E-06	1.18E-09	1.18E-09	1.04E-05	—	2.00E-06	No
205-99-2	Benzo(b)fluoranthene[2,3]	1.80E-06	1.76E-09	1.78E-09	1.56E-05	—	2.00E-06	No
191-24-2	Benzo(g,h,i)perylene[2]	1.20E-06	1.18E-09	1.18E-09	1.04E-05	—	9.10E-05	No
205-82-3	Benzo(k)fluoranthene[2,3]	1.80E-06	1.76E-09	1.78E-09	1.56E-05	—	2.00E-06	No
218-01-9	Chrysene[2,3]	1.80E-06	1.76E-09	1.78E-09	1.56E-05	—	2.00E-06	No
53-70-3	Dibenzo(a,h)anthracene[2,3]	1.20E-06	1.18E-09	1.18E-09	1.04E-05	—	2.00E-06	No
25321-22-6	Dichlorobenzene	1.20E-03	1.18E-06	1.18E-06	1.04E-02	—	—	No
206-44-0	Fluoranthene[2]	3.00E-06	2.94E-09	2.96E-09	2.59E-05	—	9.10E-05	No
86-73-7	Fluorene[2]	2.80E-06	2.75E-09	2.76E-09	2.42E-05	—	9.10E-05	No
50-00-0	Formaldehyde	7.50E-02	7.35E-05	7.40E-05	6.48E-01	—	5.10E-04	No
110-54-3	n-Hexane	1.80E+00	1.76E-03	1.78E-03	1.56E+01	12	—	No
193-39-5	Indeno(1,2,3-cd)pyrene[2,3]	1.80E-06	1.76E-09	1.78E-09	1.56E-05	—	2.00E-06	No
91-20-3	Naphthalene	6.10E-04	5.98E-07	6.02E-07	5.27E-03	3.33	—	No
85-01-8	Phenanathrene[2]	1.70E-05	1.67E-08	1.68E-08	1.47E-04	—	9.10E-05	No
129-00-0	Pyrene[2]	5.00E-06	4.90E-09	4.93E-09	4.32E-05	—	9.10E-05	No
108-88-3	Toluene	3.40E-03	3.33E-06	3.36E-06	2.94E-02	25	—	No
7440-38-2	Arsenic	2.00E-04	1.96E-07	1.97E-07	1.73E-03	—	1.50E-06	No
7440-39-3	Barium	4.40E-03	4.31E-06	4.34E-06	3.80E-02	0.033	—	No
7440-41-7	Beryllium	1.20E-05	1.18E-08	1.18E-08	1.04E-04	—	2.80E-05	No
7440-43-9	Cadmium	1.10E-03	1.08E-06	1.09E-06	9.51E-03	—	3.70E-06	No
7440-47-3	Chromium	1.40E-03	1.37E-06	1.38E-06	1.21E-02	0.033	—	No
7440-48-4	Cobalt	8.40E-05	8.24E-08	8.29E-08	7.26E-04	0.0033	—	No
7440-50-8	Copper	8.50E-04	8.33E-07	8.39E-07	7.35E-03	0.013	—	No
7439-96-5	Manganese	3.80E-04	3.73E-07	3.75E-07	3.29E-03	0.067	—	No
7439-97-6	Mercury	2.60E-04	2.55E-07	2.57E-07	2.25E-03	—	—	No
7439-98-7	Molybdenum	1.10E-03	1.08E-06	1.09E-06	9.51E-03	0.333	—	No
7440-02-0	Nickel	2.10E-03	2.06E-06	2.07E-06	1.82E-02	—	2.70E-05	No
7782-49-2	Selenium	2.40E-05	2.35E-08	2.37E-08	2.07E-04	0.013	—	No
7440-62-2	Vanadium	2.30E-03	2.25E-06	2.27E-06	1.99E-02	0.003	—	No
7440-66-6	Zinc	2.90E-02	2.84E-05	2.86E-05	2.51E-01	0.667	—	No
	Lead	5.00E-04	4.90E-07	4.93E-07	4.32E-03			
NA	PAH - B(a)P Equivalent	—		1.13E-08	9.86E-05	—	2.00E-06	No

1. Emission factors obtained from AP-42, Chapter 1.4, Tables 1.4-3 and 1.4-4
2. Polycyclic Organic Matter (POM)
3. POM as Polyaromatic Hydrocarbons (PAH)

New Therminol Heater Burner TAC Emissions

Fuel	Natural Gas (NG)
High Heating Value of NG (btu/scf)	1020
Heat Input Rating (Mmbtu/hr)	25.55
Operating Time (hours/year)	8760
Operating Time (hours/day)	24
Load Factor	1

CAS Number	Pollutant	Emission Factor[1]		Emissions		Screening Emissions Levels (EL)		Modeling Required
		Emissin Factor (lb/MMscf)	Emissin Factor (lb/MMBtu)	Hourly (lb/hr)	Annual (lb/year)	Non Carcinogenic (lb/hr)	Carcinogenic (lb/hr)	Yes/No
91-57-6	2-Methylnaphthalene[2]	2.40E-05	2.35E-08	6.01E-07	5.27E-03	—	9.10E-05	No
56-49-5	3-Methylchloranthrene[2]	1.80E-06	1.76E-09	4.51E-08	3.95E-04	—	2.50E-06	No
57-97-6	7,12-Dimethylbenz(a)anthracene[2]	1.60E-05	1.57E-08	4.01E-07	3.51E-03	—	9.10E-05	No
83-32-9	Acenaphthene[2]	1.80E-06	1.76E-09	4.51E-08	3.95E-04	—	9.10E-05	No
208-96-8	Acenaphthylene[2]	1.80E-06	1.76E-09	4.51E-08	3.95E-04	—	9.10E-05	No
120-12-7	Anthracene[2]	2.40E-06	2.35E-09	6.01E-08	5.27E-04	—	9.10E-05	No
56-55-3	Benz(a)anthracene[2,3]	1.80E-06	1.76E-09	4.51E-08	3.95E-04	—	2.00E-06	No
71-43-2	Benzene	2.10E-03	2.06E-06	5.26E-05	4.61E-01	—	8.00E-04	No
50-32-8	Benzo(a)pyrene[2,3]	1.20E-06	1.18E-09	3.01E-08	2.63E-04	—	2.00E-06	No
205-99-2	Benzo(b)fluoranthene[2,3]	1.80E-06	1.76E-09	4.51E-08	3.95E-04	—	2.00E-06	No
191-24-2	Benzo(g,h,i)perylene[2]	1.20E-06	1.18E-09	3.01E-08	2.63E-04	—	9.10E-05	No
205-82-3	Benzo(k)fluoranthene[2,3]	1.80E-06	1.76E-09	4.51E-08	3.95E-04	—	2.00E-06	No
218-01-9	Chrysene[2,3]	1.80E-06	1.76E-09	4.51E-08	3.95E-04	—	2.00E-06	No
53-70-3	Dibenzo(a,h)anthracene[2,3]	1.20E-06	1.18E-09	3.01E-08	2.63E-04	—	2.00E-06	No
25321-22-6	Dichlorobenzene	1.20E-03	1.18E-06	3.01E-05	2.63E-01	—	—	No
206-44-0	Fluoranthene[2]	3.00E-06	2.94E-09	7.51E-08	6.58E-04	—	9.10E-05	No
86-73-7	Fluorene[2]	2.80E-06	2.75E-09	7.01E-08	6.14E-04	—	9.10E-05	No
50-00-0	Formaldehyde	7.50E-02	7.35E-05	1.88E-03	1.65E+01	—	5.10E-04	Yes
110-54-3	n-Hexane	1.80E+00	1.76E-03	4.51E-02	3.95E+02	12	—	No
193-39-5	Indeno(1,2,3-cd)pyrene[2,3]	1.80E-06	1.76E-09	4.51E-08	3.95E-04	—	2.00E-06	No
91-20-3	Naphthalene	6.10E-04	5.98E-07	1.53E-05	1.34E-01	3.33	—	No
85-01-8	Phenanathrene[2]	1.70E-05	1.67E-08	4.26E-07	3.73E-03	—	9.10E-05	No
129-00-0	Pyrene[2]	5.00E-06	4.90E-09	1.25E-07	1.10E-03	—	9.10E-05	No
108-88-3	Toluene	3.40E-03	3.33E-06	8.52E-05	7.46E-01	25	—	No
7440-38-2	Arsenic	2.00E-04	1.96E-07	5.01E-06	4.39E-02	—	1.50E-06	Yes
7440-39-3	Barium	4.40E-03	4.31E-06	1.10E-04	9.65E-01	0.033	—	No
7440-41-7	Beryllium	1.20E-05	1.18E-08	3.01E-07	2.63E-03	—	2.80E-05	No
7440-43-9	Cadmium	1.10E-03	1.08E-06	2.76E-05	2.41E-01	—	3.70E-06	Yes
7440-47-3	Chromium	1.40E-03	1.37E-06	3.51E-05	3.07E-01	0.033	—	No
7440-48-4	Cobalt	8.40E-05	8.24E-08	2.10E-06	1.84E-02	0.0033	—	No
7440-50-8	Copper	8.50E-04	8.33E-07	2.13E-05	1.87E-01	0.013	—	No
7439-96-5	Manganese	3.80E-04	3.73E-07	9.52E-06	8.34E-02	0.067	—	No
7439-97-6	Mercury	2.60E-04	2.55E-07	6.51E-06	5.71E-02	—	—	No
7439-98-7	Molybdenum	1.10E-03	1.08E-06	2.76E-05	2.41E-01	0.333	—	No
7440-02-0	Nickel	2.10E-03	2.06E-06	5.26E-05	4.61E-01	—	2.70E-05	Yes
7782-49-2	Selenium	2.40E-05	2.35E-08	6.01E-07	5.27E-03	0.013	—	No
7440-62-2	Vanadium	2.30E-03	2.25E-06	5.76E-05	5.05E-01	0.003	—	No
7440-66-6	Zinc	2.90E-02	2.84E-05	7.26E-04	6.36E+00	0.667	—	No
NA	PAH - B(a)P Equivalent	—		2.55E-07	2.50E-03	—	2.00E-06	No

1. Emission factors obtained from AP-42, Chapter 1.4, Tables 1.4-3 and 1.4-4
2. Polycyclic Organic Matter (POM)
3. POM as Polyaromatic Hydrocarbons (PAH)

B-5 Nebraska Boiler Criteria Pollutant Emissions

	SPA #1 and 2	SPA #3	
Fuel	Natural Gas (NG)	Natural Gas (NG)	
High Heating Value of NG (btu/scf)	1020	1020	
Heat Input Rating (Mmbtu/hr)	213.8	1.01	<-incremental
Steam Capacity (lb/hr)	175000	824	
Burner Type	Controlled - Low NOx burners		

July 1-Sept 30, 2012 Plant Data:
Average Steam Rate: 100.8

124.2 <-- Avg + incremental

Pollutants	Permitted SPA #1 and 2 Emissions (Permit Condition 5.2)		Emissions Increase Due to SPA #3	
	Hourly (lb/hr)	Annual (tons/yr)	Hourly (lb/hr)	Annual (tons/yr)
NOx	16.84	70.71	0.079	0.333
CO	8.42	35.40	0.040	0.167
SO_2	0.13	0.53	0.001	0.002
PM10	1.05	4.42	0.005	0.021
VOC	0.36	1.50	0.002	0.007

Note:
Incremental emissions due to increased steam usage by SPA #3 were estimated by prorating the permitted B-5 boiler emissions in proportion to the steam requirements.

Stack gas flow rate

F-Factor (dscf/MMBtu)		8710	
% Oxygen in stack exhaust		0	
Heat input rate (MMBtu/hr)		124.16	
Stack gas flow rate (dscfm) at STP (68 °F and 1 atm)		18023.24	
Actual temperature (°F)		309.4	(Measurement average between July 1-September 30, 2012)
Actual pressure (atm)		0.797	(standard atmospheric pressure at 6150 ft elevation)
Stack gas flow rate (acfm) at actual temperature and pressure		32959	

PPA Cooling Tower PM

Parameter	Units	Value	Data Source
Water Circulation Rate	gpm	1,200	Additional load due to SPA #3
Total Liquid Drift	(%)	0.00283%	Drift emissions test conducted on 10/15/2010
Maximum TDS of Circulated Water	(ppmw)	2,200	Previous Tier I permit calculations
Annual Operating hours	hours/year	8,760	
Mass Fraction of PM2.5 in PM10	Unitless	0.60	SCAQMD, Appendix A - Updated CEIDARS Table with PM2.5 Fractions, Final Methodology to Calculate PM2.5 and PM2.5 Significance Thresholds (October 2006)
Emission Rate			
PM	lb/hr	0.04	
	ton/yr	0.16	
PM10[1]	lb/hr	0.04	
	ton/yr	0.16	
PM2.5[2]	lb/hr	0.02	
	ton/yr	0.10	

NOTES:

1. PM10 Emission Rate = based on USEPA AP-42, Section 13.4 Wet Cooling Towers, Table 13.4-1, modified to design

   Rates calculated as follows:

   E lb/hr = Water Circulation Rate gpm * 60 min/hr * Drift % * 8.3453 lb/gal * TDS lb PM / 1,000,000 lb water

   E ton/yr = E lb/hr * 8,760 hr/yr * ton/2,000 lb

2 PM2.5 emission rate = PM2.5 mass fraction in PM10 x PM10 emission rate

New Thermінol Heater Burner Criteria Pollutant and GHG Emissions

Fuel	Natural Gas (NG)
High Heating Value of NG (btu/scf)	1020
Heat Input Rating (Mmbtu/hr)	25.55
Operating Time (hours/year)	8760
Operating Time (hours/day)	24
Load Factor	1
Burner Type	Controlled - Low NOx burners

Pollutants	Emission Factor		Emissions		
	lb/MMscf	lb/MMbtu	Hourly (lb/hr)	Daily (lb/day)	Annual (tons/yr)
NOx[1]	50	0.0490	1.25	30.06	5.49
CO[1]	84	0.0824	2.10	50.50	9.22
SO_2[2]	0.6	0.0006	0.02	0.36	0.07
PM10	7.6	0.0075	0.19	4.57	0.83
PM2.5	7.6	0.0075	0.19	4.57	0.83
Lead[2]	0.0005	0.0000	0.00	0.00	0.00
VOC	5.5	0.0054	0.14	3.31	0.60
TOC[2]	11	0.0108	0.28	6.61	1.21
CO_2[2]	120,000	118	3005.88	72141.18	13165.76
CH_4[2]	2.3	0.0023	0.06	1.38	0.25
N_2O[2]	0.64	0.0006	0.02	0.38	0.07
CO_2e[3]			3012.06	72289.49	13192.83
PM (total)[2]	7.6	0.0075	0.19	4.57	0.83
PM (condensable)[2]	5.7	0.0056	0.14	3.43	0.63
PM (filterable)[2]	1.9	0.0019	0.05	1.14	0.21

Note:

1. NOx and CO emission factors from AP-42, Chapter 1.4, Table 1.4-1
2. Emission factors obtained from AP-42, Chapter 1.4, Table 1.4-2
3. CO_2e Emissions = CO_2 Emissions + CH_4 Emission x GWP (21) + N_2O Emissions x GWP (310)

Small Burner Type (<100 MMBtu/hr)	NOx Emission Factor (lb/MMscf)	CO Emission Factor (lb/MMScf)	N_2O Emission Factor (lb/MMscf)
Uncontrolled	100	84	2.2
Controlled - Low NOx burners	50	84	0.64
Controlled - Low NOx burners/Flue gas recirculation	32	84	0.64

Nu-West Conda Phosphate Operations

Superphosphoric Acid Process Line Fluoride Emissions Based on Stack Test Data Proration

Permit Section		Units	Permit Limit	Existing SPA (from stack tests resulting in maximum emissions)	Additional #3 SPA Estimated
	50-58% P_2O_5 Acid Feed	gpm	*none*	126.4	62
	Specific Gravity	none	*none*	1.8	1.71
	50-58% P_2O_5 Acid Feed	lb/hr	*none*	113,851	52,881
	50-58% P_2O_5 Acid Feed	tons/day	*none*	1,366	635
	Equivalent P_2O_5 Feed	wt%	*none*	59.11	53.00
	Equivalent P_2O_5 Feed	lb/hr	*none*	67,297	28,027
	Equivalent P_2O_5 Feed	tons/day	*none*	808	336
	Equivalent P_2O_5 Feed	tons/hr	*none*	34	14
	Equivalent P_2O_5 Feed	tons/year	*560000*	294,762	122,759
	SPA Process Fluoride emissions*	lb F/hr	*none*	0.181	0.075
6.2	SPA Process Fluoride emissions	lb F/ton equivalent P_2O_5 feed	0.00870	0.00538	0.00538
	68-70% P_2O_5 SPA Product	tons/day	*none*	---	487
	68-70% P_2O_5 SPA Product	lb/hr	*none*	---	40,619
6.6	SPA Scrubber Flow	gpm	559 maximum	510.17	
6.6	SPA Scrubber Pressure Drop	in. H_2O	6.38 maximum	5.43	

* Increase proportional to feed Ems for SPA3 = Stack Ems for SPA1&2 x Eq. SPA3 Feed / Ini Eq. SPA 1&2 Feed

Superphosphoric Acid Process Line Fluoride Emissions Based on Permit Limit

Permit Section		Units	Value
6.2	SPA Process Fluoride Emissions Permit Limit	lb F/ton equivalent P_2O_5 feed	0.00870
	Post-Project SPA #1 & 2 Equivalent P_2O_5 Feed	tons/hr	28
	Post-Project SPA #3 Equivalent P_2O_5 Feed	tons/hr	14
	Post-Project Fluoride emissions from SPA #1 and 2	lb F/hr	0.24
	Post-project Fluoride emissions from SPA #3	lb F/hr	0.12
	Total Post-Project Fluoride Emissions from SPA process Line	tpy	1.6

Nu-West Conda Phosphate Operations

Permit Section 6: Superphosphoric Acid Process Stack Test Data

Permit Section		Units	SPA Stack Actual 2012	SPA Stack Actual 2011	SPA Stack Actual 2010	SPA Stack Actual 2009	SPA Stack Actual 2008	SPA Stack Actual 2007
	50-58% P_2O_5 Acid Feed	gpm	126.4	133.4	130.4	138.14		129.3
	Specific Gravity		1.8	1.816	1.839	1.8		1.804
	Equivalent P_2O_5 Feed	wt%	59.11	59.41	59.73	59.11		58.70
	Equivalent P_2O_5 Feed	tons/hr	33.6	36.0	35.8	36.9		34.3
6.6	SPA Scrubber Flow	gpm	510.17	506.00	452.00	465.77		
6.6	SPA Scrubber Pressure Drop	in. H_2O	5.43	5.09	4.97	5.32		
6.2	SPA Process Fluoride emissions	lb F/hr	0.181	0.024	0.019	0.154		0.113
6.2	SPA Process Fluoride emissions	lb F/ton equivalent P_2O_5 feed	5.38E-03	6.67E-04	5.20E-04	4.19E-03		3.29E-03
	SPA Process PM emissions	lb PM/hr				0.25		0.28
	SPA Process CPM ($PM_{2.5}$) emissions	lb CPM ($PM_{2.5}$)/hr				0.09		0.09
	SPA Process PM_{10} emissions	lb PM10/hr				0.34		0.37
6.4	SPA Oxidation NO_x emissions	lb/hr					0.137	
	SPA Oxidation CO emissions	lb/hr					2.175	

Nu-West Conda Phosphate Operations

Superphosphoric Acid Process Line PM10 and PM2.5 Emissions Based on Stack Test Data Proration

Permit Section		Units	Permit Limit	Existing SPA (from stack tests resulting in maximum emissions)	Additional #3 SPA Estimated
	50-58% P_2O_5 Acid Feed	gpm	*none*	129.3	62
	Specific Gravity	none	*none*	1.804	1.71
	50-58% P_2O_5 Acid Feed	lb/hr	*none*	116,722	52,881
	50-58% P_2O_5 Acid Feed	tons/day	*none*	1,401	635
	Equivalent P_2O_5 Feed	wt%	*none*	58.70	53.00
	Equivalent P_2O_5 Feed	lb/hr	*none*	68,516	28,027
	Equivalent P_2O_5 Feed	tons/day	*none*	822	336
	Equivalent P_2O_5 Feed	tons/hr	*none*	34.3	14
	Equivalent P_2O_5 Feed	tons/year	*560000*	300,099	122,759
	SPA Process PM10 emissions*	lb PM10/hr	*none*	0.370	0.151
	SPA Process CPM ($PM_{2.5}$) emissions	lb CPM ($PM_{2.5}$)/hr	*none*	0.090	0.037
	SPA Process CPM ($PM_{2.5}$) emissions	ton CPM ($PM_{2.5}$)/yr	*none*	0.394	0.161

* Increased PM10 and PM2.5 from SPA scrubber from the addition of SPA#3 calculated from higher result of past two source tests (2007 and 2009), prorating to maximum P2O5 capacity of SPA#3.

Increase proportional to feed Ems for SPA3 = Stack Ems for SPA1&2 x Eq. SPA3 Feed / Ini Eq. SPA 1&2 Feed

P2O5 Feed

	Units	Estimated SPA #3 Feed
SPA #3 P_2O_5 Acid Feed	gpm	62
Specific Gravity of SPA #3 P_2O_5 Acid Feed	none	1.71
SPA #3 P_2O_5 Acid Feed	lb/hr	52,881
SPA #3 P_2O_5 Acid Feed	tons/day	635
Equivalent P_2O_5 Feed	wt%	53.00
Equivalent P_2O_5 Feed	lb/hr	28,027
Equivalent P_2O_5 Feed	tons/day	336
Equivalent P_2O_5 Feed	tons/hr	14
Equivalent P_2O_5 Feed	tons/year	122,759

Let:
Ini SPA 1&2 = Initial pre-project feed into SPA #1 and 2)
Red SPA 1&2 = Reduction in Feed to SPA #1 & 2 due to the project
SPA = overall feed post-project into all three SPA trains
SPA3 = Feed to SPA #3

		Equivalent P_2O_5 Daily Feed (tons/day)	Equivalent P_2O_5 Annual Feed (tons/year)	Equivalent P_2O_5 Hourly Feed (tons/hr)
Weight Percentage	wt%	100%	100%	100%
Post-project SPA #1 & #2 Feed	(Ini SPA 1&2) - (Red SPA 1&2)	664	242,360	28
Feed to SPA #3	SPA3	336	122,759	14
Post-project SPA #1, 2, & 3 Feed	SPA = (Ini SPA 1&2) - (Red SPA 1&2) + (SPA3)	1000	365,119	42
Overall Change	Δ = (SPA) - (Ini SPA 1&2)	196	71,540	8
Initial pre-project feed into SPA #1 and 2	Ini SPA 1&2	804	293,579	34
Reduction in Feed to SPA #1 & 2 due to the project	Red SPA 1&2	140	51,219	6
% Change in overall feed due to the project	%Δ = Δ*100/(Ini SPA 1&2)	24.4%	24.4%	24.4%
Feed distribution post-project		SPA #1&2	SPA #3	Total
Annual Feed post-project	ton/year	242,360	122,759	365119
% Distribution	%	66%	34%	

Note:
1. No contemporaneous emission decreases were included in the emission inventory for the decreased throughput through SPA #1 and #2 or other plant processes.

Criteria Emissions Summary - Modeling Protocol

Source	NOx		CO		PM_{10}		$PM_{2.5}$		SO_2		Lead	Fluoride
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/month	lb/hr
Thermal Heater[1]	1.25	5.49	2.10	9.22	0.19	0.834	0.19	0.83	0.015	0.066	0.0274	—
#3 SPA Scrubber[2]	—	—	—	—	0.303	1.33	0.074	0.323	—	—	—	0.12
SPA Oxidation[3]	0.109	0.48	1.73	7.56								
B-5 Boiler[4]	0.08	0.33	0.04	0.17	0.005	0.02	0.005	0.021	0.001	0.0025	0.0011	—
Cooling Tower[5]	—	—	—	—	0.037	0.164	0.022	0.098	—	—	—	—
TOTALS	1.44	6.29	3.87	16.95	0.535	2.34	0.29	1.28	0.016	0.068	0.029	0.12

Level I Modeling Threshold	0.2	1.2	15	—	0.22	—	0.054	0.35	0.21	1.2	14	0.167
Level II Modeling Threshold	2.4	14	175	—	2.6	—	0.63	4.1	2.5	14		
Modeling Required (Yes/No/Maybe)	No per DEQ email 12/5/2012	No per DEQ email 12/5/2012	No	No	No per DEQ email 12/5/2012	No	No per DEQ email 12/5/2012	No per DEQ email 12/5/2012	No	No	No	No

Note for File:
ERM followed a spreadsheet sent by IDEQ. Their spreadsheet was dividing annual emissions by 4, not 12, calling it a rolling 3-month number. Implies a quarterly total, even though modeling guidance states lb/month.

1. Low-NOx burner. For natural gas combustion, PM2.5 = PM10 per AP-42.
2. Increased PM10 and PM2.5 from SPA scrubber from the addition of SPA#3 calculated from higher result of past two source tests (2007 and 2009), prorating to maximum P2O5 capacity of SPA#3, and then multiplying by a safety factor of two.
3 Increased NOx and CO from SPA scrubber due to the addition of SPA#3 calculated from NOx and CO emission measurements from 2008 source test, prorating to maximum P2O5 capacity of SPA#3 assuming average P2O5 feed rate from other 2007, 2009, 2010, 2011, and 2012 source tests, and then multiplying by a safety factor of two.
4 Increased emissions (within current permit limits) from existing Nebraska boiler from a small load increase to provide steam for SPA #3 vacuum jets. The estimates provided were derived by prorating the Tier I emission limits for this boiler for the expected additional steam demand for SPA #3. PM2.5 was assumed equal to PM10 per AP-42.
5 Increased PM10 and PM2.5 from the FPA cooling tower (above current actual emissions) due to an approximate 1200 gpm increase in circulating water to provide additional cooling for SPA #3. The estimates provided in Table 1 were derived from 2010 drift rate measurements from FPA cooling tower, a TDS loading of 2,200 ppmw, and an assumption that all drift PM was PM10. PM2.5 estimate assumed 60% PM10 = PM2.5. This is expected to be overpredictive.

Agrium #3 SPA
HAP & TAPS
12/11/2012

#3 SPA Project Hazardous and Toxic Air Pollutants

HAP & TAP Emissions

CAS Number	Pollutant	Emissions from New Thermal Heater[6]			Incremental Emissions from Existing B-5 Boiler[5]			Total Emissions			Screening Emissions Levels (EL)		Modeling Required
		Hourly (lb/hr)	Annual (lb/year)	Annual (ton/yr)	Hourly (lb/hr)	Annual (lb/year)	Annual (ton/yr)	Hourly (lb/hr)	Annual (lb/year)	Annual (ton/yr)	Non Carcinogenic (lb/hr)	Carcinogenic (lb/hr)	Yes/No
91-57-6	2-Methylnaphthalene[2]	6.01E-07	5.27E-03	2.63E-06	2.37E-08	2.07E-04	1.04E-07	6.25E-07	5.47E-03	2.74E-06	—	9.10E-05	No
56-49-5	3-Methylchloranthrene[2]	4.51E-08	3.95E-04	1.97E-07	1.78E-09	1.56E-05	7.78E-09	4.69E-08	4.11E-04	2.05E-07	—	2.50E-06	No
57-97-6	7,12-Dimethylbenz(a)anthracene[2]	4.01E-07	3.51E-03	1.76E-06	1.58E-08	1.38E-04	6.92E-08	4.17E-07	3.65E-03	1.82E-06	—	9.10E-05	No
83-32-9	Acenaphthene[2]	4.51E-08	3.95E-04	1.97E-07	1.78E-09	1.56E-05	7.78E-09	4.69E-08	4.11E-04	2.05E-07	—	9.10E-05	No
208-96-8	Acenaphthylene[2]	4.51E-08	3.95E-04	1.97E-07	1.78E-09	1.56E-05	7.78E-09	4.69E-08	4.11E-04	2.05E-07	—	9.10E-05	No
120-12-7	Anthracene[2]	6.01E-08	5.27E-04	2.63E-07	2.37E-09	2.07E-05	1.04E-08	6.25E-08	5.47E-04	2.74E-07	—	9.10E-05	No
56-55-3	Benz(a)anthracene[2,3]	4.51E-08	3.95E-04	1.97E-07	1.78E-09	1.56E-05	7.78E-09	4.69E-08	4.11E-04	2.05E-07	—	2.00E-06	No
71-43-2	Benzene	5.26E-05	4.61E-01	2.30E-04	2.07E-06	1.82E-02	9.08E-06	5.47E-05	4.79E-01	2.39E-04	—	8.00E-04	No
50-32-8	Benzo(a)pyrene[2,3]	3.01E-08	2.63E-04	1.32E-07	1.18E-09	1.04E-05	5.19E-09	3.12E-08	2.74E-04	1.37E-07	—	2.00E-06	No
205-99-2	Benzo(b)fluoranthene[2,3]	4.51E-08	3.95E-04	1.97E-07	1.78E-09	1.56E-05	7.79E-09	4.69E-08	4.11E-04	2.05E-07	—	2.00E-06	No
191-24-2	Benzo(g,h,i)perylene[2]	3.01E-08	2.63E-04	1.32E-07	1.18E-09	1.04E-05	5.19E-09	3.12E-08	2.74E-04	1.37E-07	—	9.10E-05	No
205-82-3	Benzo(k)fluoranthene[2,3]	4.51E-08	3.95E-04	1.97E-07	1.78E-09	1.56E-05	7.78E-09	4.69E-08	4.11E-04	2.05E-07	—	2.00E-06	No
218-01-9	Chrysene[2,3]	4.51E-08	3.95E-04	1.97E-07	1.78E-09	1.56E-05	7.78E-09	4.69E-08	4.11E-04	2.05E-07	—	2.00E-06	No
53-70-3	Dibenzo(a,h)anthracene[2,3]	3.01E-08	2.63E-04	1.32E-07	1.18E-09	1.04E-05	5.19E-09	3.12E-08	2.74E-04	1.37E-07	—	2.00E-06	No
25321-22-6	Dichlorobenzene	3.01E-05	2.63E-01	1.32E-04	1.18E-06	1.04E-02	5.19E-06	3.12E-05	2.74E-01	1.37E-04	---	—	No
206-44-0	Fluoranthene[2]	7.51E-08	6.58E-04	3.29E-07	2.96E-09	2.59E-05	1.30E-08	7.81E-08	6.84E-04	3.42E-07	—	9.10E-05	No
86-73-7	Fluorene[2]	7.01E-08	6.14E-04	3.07E-07	2.76E-09	2.42E-05	1.21E-08	7.29E-08	6.39E-04	3.19E-07	—	9.10E-05	No
50-00-0	Formaldehyde	1.88E-03	1.65E+01	8.23E-03	7.40E-05	6.48E-01	3.24E-04	1.95E-03	1.71E+01	8.55E-03	—	5.10E-04	Yes
110-54-3	n-Hexane	4.51E-02	3.95E+02	1.97E-01	1.78E-03	1.56E+01	7.78E-03	4.69E-02	4.11E+02	2.05E-01	12	—	No
193-39-5	Indeno(1,2,3-cd)pyrene[2,3]	4.51E-08	3.95E-04	1.97E-07	1.78E-09	1.56E-05	7.78E-09	4.69E-08	4.11E-04	2.05E-07	—	2.00E-06	No
91-20-3	Naphthalene	1.53E-05	1.34E-01	6.69E-05	6.02E-07	5.27E-03	2.64E-06	1.59E-05	1.39E-01	6.96E-05	3.33	—	No
85-01-8	Phenanathrene[2]	4.26E-07	3.73E-03	1.87E-06	1.66E-08	1.47E-04	7.35E-08	4.43E-07	3.88E-03	1.94E-06	---	9.10E-05	No
129-00-0	Pyrene[2]	1.25E-07	1.10E-03	5.49E-07	4.93E-09	4.32E-05	2.16E-08	1.30E-07	1.14E-03	5.70E-07	—	9.10E-05	No
108-88-3	Toluene	8.52E-05	7.46E-01	3.73E-04	3.36E-06	2.94E-02	1.47E-05	8.85E-05	7.75E-01	3.88E-04	25	—	No
7440-38-2	Arsenic	5.01E-06	4.39E-02	2.19E-05	1.97E-07	1.73E-03	8.65E-07	5.21E-06	4.56E-02	2.28E-05	—	1.50E-08	Yes
7440-39-3	Barium	1.10E-04	9.65E-01	4.83E-04	4.34E-06	3.80E-02	1.90E-05	1.15E-04	1.00E+00	5.02E-04	0.033	—	No
7440-41-7	Beryllium	3.01E-07	2.63E-03	1.32E-06	1.18E-08	1.04E-04	5.19E-08	3.12E-07	2.74E-03	1.37E-06	—	2.80E-05	No
7440-43-9	Cadmium	2.76E-05	2.41E-01	1.21E-04	1.09E-06	9.51E-03	4.76E-06	2.86E-05	2.51E-01	1.25E-04	—	3.70E-06	Yes
7440-47-3	Chromium	3.51E-05	3.07E-01	1.54E-04	1.38E-06	1.21E-02	6.05E-06	3.65E-05	3.19E-01	1.60E-04	0.033	---	No
7440-48-4	Cobalt	2.10E-06	1.84E-02	9.22E-06	8.29E-08	7.26E-04	3.63E-07	2.19E-06	1.92E-02	9.58E-06	0.0033	—	No
7440-50-8	Copper	2.13E-05	1.87E-01	9.33E-05	8.39E-07	7.35E-03	3.67E-06	2.21E-05	1.94E-01	9.69E-05	0.013	—	No
7439-96-5	Manganese	9.52E-06	8.34E-02	4.17E-05	3.75E-07	3.29E-03	1.64E-06	9.89E-06	8.67E-02	4.33E-05	0.067	—	No
7439-97-6	Mercury	6.51E-06	5.71E-02	2.85E-05	2.57E-07	2.25E-03	1.12E-06	6.77E-06	5.93E-02	2.96E-05	—	—	No
7439-98-7	Molybdenum	2.76E-05	2.41E-01	1.21E-04	1.09E-06	9.51E-03	4.76E-06	2.86E-05	2.51E-01	1.25E-04	0.333	—	No
7440-02-0	Nickel	5.26E-05	4.61E-01	2.30E-04	2.07E-06	1.82E-02	9.08E-06	5.47E-05	4.79E-01	2.39E-04	—	2.70E-05	Yes
7782-49-2	Selenium	6.01E-07	5.27E-03	2.63E-06	2.37E-08	2.07E-04	1.04E-07	6.25E-07	5.47E-03	2.74E-06	0.013	—	No
7440-62-2	Vanadium	5.76E-05	5.05E-01	2.52E-04	2.27E-06	1.99E-02	9.94E-06	5.99E-05	5.25E-01	2.62E-04	0.003	—	No
7440-66-6	Zinc	7.26E-04	6.36E+00	3.18E-03	2.86E-05	2.51E-01	1.25E-04	7.55E-04	6.61E+00	3.31E-03	0.667	—	No
NA	PAH - B(a)P Equivalent	2.86E-07	2.50E-03	1.25E-06	1.13E-08	9.86E-05	4.93E-08	2.97E-07	2.60E-03	1.30E-06	—	2.00E-06	No

Note:

1. Emission factors obtained from AP-42, Chapter 1.4, Tables 1.4-3 and 1.4-4

2. Polycyclic Organic Matter (POM)

3. POM as Polyaromatic Hydrocarbons (PAH)

4. Potential to emit.

5. Incremental emissions.

6. Above emission estimates do not include any contemporaneous emission decreases from reduced throughput from #1 SPA and #2 SPA or other plant processes.

#3 SPA Project Greenhouse Gases

Project GHG Emissions

Equipment	Calculation Methodology	Methodology Citation	Gases to Report	Heat Input (MMBtu/yr)	Electricity Use (MWh/yr)	CO_2 EF	CO_2 EF Units	CH_4 EF	CH_4 EF Units	N_2O EF	N_2O EF Units	CO_2 (kg/yr)	CH_4 (kg/yr)	N_2O (kg/yr)	CO_2e (kg/yr)	CO_2e (metric tons/yr)	CO_2e tons/yr
New Thermal Heater	AP-42, Chapter 1.4, Table 1.4-2	Note 1,2,3	CO2, CH4, N2O	223,818	-	118	lb/MMBtu	0.0025	lb/MMBtu	0.00065	lb/MMBtu	11,943,808	229	64	11,968,436	11,968	13,188
Existing Nebraska B-5 Boiler	AP-42, Chapter 1.4, Table 1.4-2	Note 1,2,4	CO2, CH4, N2O	8,819	-	118	lb/MMBtu	0.0025	lb/MMBtu	0.00065	lb/MMBtu	471,820	5	3	471,563	472	520
															Total	12,440	13,718

Note:

1) CO_2e Emissions = CO_2 Emissions + CH_4 Emissions x GWP (21) + N_2O Emissions x GWP (310)

2) Above emission estimates do not include any contemporaneous emission decreases from reduced throughput from #1 SPA and #2 SPA.

3) Potential to emit.

4) Incremental emissions.

#3 SPA Project: Criteria and Fluoride Emissions

#3 SPA Project Emissions

Equipment	NO_X (TPY)	CO (TPY)	PM (TPY)	PM_{10} (TPY)	$PM_{2.5}$ (TPY)	SO_2 (TPY)	O_3 (TPY)	Pb (TPY)	H_2SO_4 (TPY)	H_2S (TPY)	VOC (TPY)	Flouride (TPY)
New Therminol Heater[1,2,3] Potential To Emit	5.5	9.2	-	0.8	0.8	6.6E-02	-	5.5E-05	-	-	0.6	-
Existing Nebraska Boiler (B-5)[1,4]	0.3	0.2	-	2.1E-02	2.1E-02	2.5E-03	-	2.2E-06	-	-	7.1E-03	-
Existing SPA Scrubber[1,5,6]	-	-	-	1.3	0.3	-	-	-	-	-	-	-
Existing SPA Oxidation Reactor[1,7]	0.5	7.6	-	-	-	-	-	-	-	-	-	0.5
Existing Cooling Tower[1,8]	-	-	-	0.2	0.1	-	-	-	-	-	-	-
Totals:	6.3	16.9	-	2.3	1.3	6.8E-02	-	5.7E-05	-	-	0.6	0.5
PSD Significance Emission Rate	40	100	-	15	10	40	-	0.6	7	-	40	3
Does the Project Emission Increase Exceed the Significant Emission Rate Threshold?	NO	NO	-	NO	NO	NO	-	NO	-	-	-	-

Note:

1) Assume 8,760 operating hours per year.

2) Low-NO_X burners Emission Factors. For natural gas combustion, $PM_{2.5} = PM_{10}$ per AP-42.

3) Potential to emit.

4) Calculated incremental emission increase (within current permit limits) using Tier 1 permit condition (5.2) emission factors and additional steam demand for #3 SPA. $PM_{2.5}$ was assumed equal to PM_{10} per /

5) PM_{10} and $PM_{2.5}$ incremental emissions found using source test data and prorated by ratio of throughput at maximum design of #3 SPA to throughput of source test. Calculated emissions then doubled.

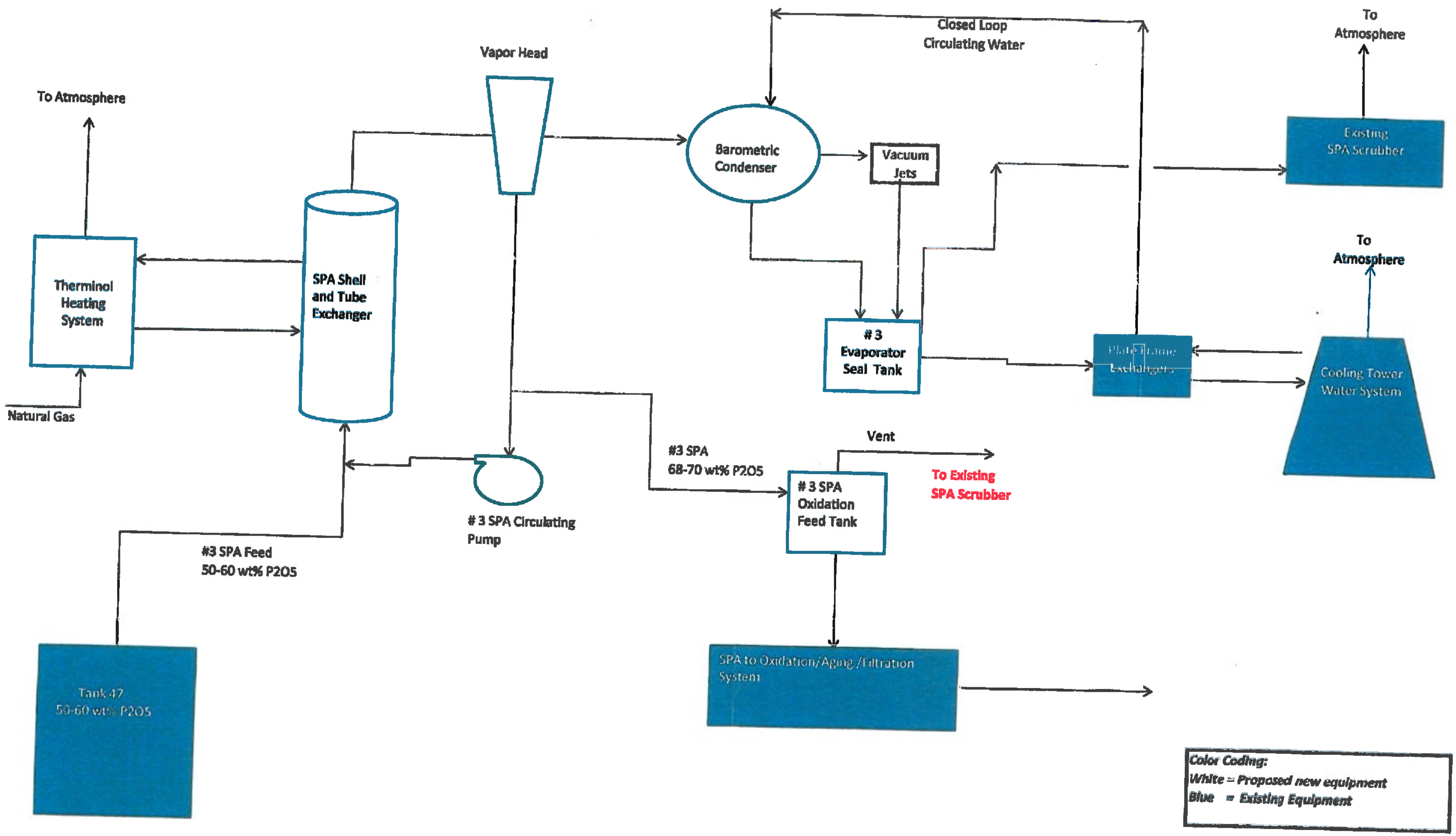
6) Fluoride incremental emissions calculated using MACT Standard emission rate of 0.00870 lb F/ton equivalent P_2O_5 feed to #3 SPA at maximum design throughput.

7) NO_X and CO incremental emissions calculated using source test data and prorated by ratio of throughput at maximum design of #3 SPA to throughput of source test. Calculated emissions then doubled.

8) Assume incremental increase of 1,200 gpm circulating water due to #3 SPA, 2010 drift rate measurements from PPA Cooling Tower, and TDS loading of 2,200 ppmw. Assume all drift PM as PM_{10}. Conservatively assume 60% $PM_{10} = PM_{2.5}$.

9) All emissions are below significant threshold defined in 40 CFR 52.21(b)(40)

10) Above emission estimates do not include any contemporaneous emission decreases from reduced throughput from #1 SPA and #2 SPA or other plant processes.



Simplified Evaporator Block Flow - Agrium #3 Super Phosphoric Acid (SPA) Production

Baseline Actual Emissions (BAE)

B-5 Nebraska Boiler

	All Criteria Pollutant and GHG, except PM	PM/PM10/PM2.5	
2-Year Annual Average Natural Gas Usage	1,104,895	1,100,918	kscf/year
Heating Value of Natural Gas	1,020	1,020	Btu/scf
Permitted Capacity (Condition 5.6)	1,768,000	1,768,000	kscf/year
Baseline Period	2006-2007	2007-2008	

Pollutant	Emission Factor		Emission Factor Reference	BAE	Permitted Emissions*	Adjusted BAE
	Value	Units		tpy	tpy	tpy
CO	6.14E-02	lb/MMBtu	Source Tests, May 26-27, 2009	34.60	35.40	34.60
NOx	7.17E-02	lb/MMBtu	2-year Average NOx Emission Factor from Records maintained as required by Conditions 5.0	40.39	70.71	40.39
SO2	0.00059	lb/MMBtu	nual Emissions Report, June 2005 s	0.33	0.53	0.33
PM	5.47E-03	lb/MMBtu	Source Tests, May 26-27, 2009	3.07	4.42	3.07
PM10	5.47E-03	lb/MMBtu	Source Tests, May 26-27, 2009	3.07	4.42	3.07
PM2.5	5.47E-03	lb/MMBtu	Assumed equal to PM10 for natural gas combustion	3.07	---	3.07
VOC	0.0013	lb/MMBtu	nual Emissions Report, June 2005 s	0.73	1.50	0.73
Lead	4.90E-07	lb/MMBtu	AP-42, Chapter 1.4, Table 1.4-2	2.76E-04	4.42E-04	2.76E-04
Asbestos	---	---	---	---	---	---
Beryllium	1.18E-08	lb/MMBtu	AP-42, Chapter 1.4, Table 1.4-4	6.63E-06	1.06E-05	6.63E-06
Mercury	2.55E-07	lb/MMBtu	AP-42, Chapter 1.4, Table 1.4-4	1.44E-04	2.30E-04	1.44E-04
Vinyl Chloride	---	---	---	---	---	---
Flourides	---	---	---	---	---	---
Sulfuric Acid Mist	---	---	---	---	---	---
H2S	---	---	---	---	---	---
TRS (including H2S)	---	---	---	---	---	---
GHG	1.22E+02	lb/MMBtu	Source Tests, May 26-27, 2009	68,747	110,005	68,747

*Tier I permit condition 5.2

SPA Scrubber

	PM/PM10/PM2.5	Fluorides	
2-Year Annual Average 100% Eq. P2O5 Feed Rate	213,105	212,288	tpy of Eq. P2O5
2-Year Annual Average Scrubber Operating Hours	8,372	8,365	hr/yr
Permitted Capacity (Condition 6.7)	560,000	560,000	tpy of Eq. P2O5
Baseline Period	2007-2008	2011-2012	

Pollutant	Emission Factor		Emission Factor Reference	BAE	Permitted Emissions*	Adjusted BAE
	Value	Units		tpy	tpy	tpy
CO	---	---	---	---	---	---
NOx	---	---	---	---	---	---
SO2	---	---	---	---	---	---
PM	0.0100	lb/ton of eq. P2O5 feed	Assumed equal to PM10	1.07	21	1.07
PM10	0.0100	lb/ton of eq. P2O5 feed	Calculated as average of past two source tests (2007 and 2009)	1.07	---	1.07
PM2.5	0.0025	lb/ton of eq. P2O5 feed	Calculated as average of past two source tests (2007 and 2009)	0.27	---	0.27
VOC	---	---	---	---	---	---
Lead	---	---	---	---	---	---
Asbestos	---	---	---	---	---	---
Beryllium	---	---	---	---	---	---
Mercury	---	---	---	---	---	---
Vinyl Chloride	---	---	---	---	---	---
Fluorides	3.02E-03	lb/ton of eq. P2O5 feed	Calculated as average of source tests conducted in baseline period (2011-2012)	0.32	2.44	0.32
Sulfuric Acid Mist	---	---	---	---	---	---
H2S	---	---	---	---	---	---
TRS (including H2S)	---	---	---	---	---	---
GHG	---	---	---	---	---	---

*Tier I permit condition 6.2 for fluorides and condition 6.5 for PM

SPA Oxidation Reactor

2-Year Annual Average 100% Eq. P2O5 Feed Rate	222,150 tpy of Eq. P2O5
2-Year Annual Average Oxidation Reactpr Operating Hours	8,370 hr/yr
Permitted Capacity (Condition 6.7)	560,000 tpy of Eq. P2O5
Baseline Period	2006-2007

Pollutant	Emission Factor		Emission Factor Reference	BAE	Permitted Emissions	Adjusted BAE
	Value	Units		tpy	tpy	tpy
CO	2.175	lb/hr	Source Test, 2008	9.10	---	9.10
NOx	0.137	lb/hr	Source Test, 2008	0.57	5	0.57
SO2	---	---	---	---	---	---
PM	---	---	---	---	---	---
PM10	---	---	---	---	---	---
PM2.5	---	---	---	---	---	---
VOC	---	---	---	---	---	---
Lead	---	---	---	---	---	---
Asbestos	---	---	---	---	---	---
Beryllium	---	---	---	---	---	---
Mercury	---	---	---	---	---	---
Vinyl Chloride	---	---	---	---	---	---
Flourides	---	---	---	---	---	---
Sulfuric Acid Mist	---	---	---	---	---	---
H2S	---	---	---	---	---	---
TRS (including H2S)	---	---	---	---	---	---
GHG	---	---	---	---	---	---

*Tier I permit condition 6.4

APPENDIX B – AMBIENT AIR QUALITY IMPACT ANALYSES

MEMORANDUM

DATE: February 28, 2013

TO: Kelli Wetzel, P.E., Permit Writer, Air Program

FROM: Darrin Mehr, Stationary Source Modeler, Air Program

PROJECT: P-2013.0001 PROJ 61142 PTC Application for the Nu-West Industries, Inc. PTC Application for the #3 Super Phosphoric Acid Evaporation System Project

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

1.0 Summary

Nu-West Industries, Inc., dba Agrium, (Agrium) submitted a Permit to Construct (PTC) application for a new super phosphoric acid evaporator system (SPA#3) and process changes associated the new SPA#3 system, at the existing Agrium fertilizer production facility located near Soda Springs, 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 facility would not cause violation of any ambient air quality standard (IDAPA 58.01.01.203.02 and IDAPA 58.01.01.203.03 [Idaho Air Rules Sections 203.02 and 203.03]). Environmental Resources Management (ERM) Agrium's permitting consultant, submitted the analyses and applicable information and data enabling DEQ to evaluate potential impacts to ambient air.

The submitted modeling information and 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 not within the scope of this DEQ modeling review); 3) adhered to established DEQ guidelines for new source review dispersion modeling; 4) showed that the criteria air pollutant emissions increases attributed to this project were below Idaho DEQ's Level I de minim is modeling thresholds or the Level II discretionary modeling thresholds specified in the *Idaho Air Quality Modeling Guideline* (State of Idaho Guideline for Performing Air Quality Impact Analyses. Doc. ID AQ-011 {rev. 2, July 2011}; 5) showed that Toxic Air Pollutant (TAP) emissions increases associated with the facility 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.

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.

Table 1. KEY CONDITIONS USED IN MODELING ANALYSES	
Criteria/Assumption/Result	**Explanation/Consideration**
Criteria air pollutant emission rates are below the State of Idaho Air Quality Modeling Guideline Level I and Level II modeling thresholds.	Compliance demonstrations for Significant Impact Level (SIL) and National Ambient Air Quality Standards (NAAQS) were not required for this project due to the low level of increase in potential emissions proposed by Agrium for all criteria air pollutants.

The timeline and associated submittals forAgrium's project, primarily reflecting the modelinganalyses, are listed below:

- October 9, 2012: A pre-application meeting was held at DEQ's state office with representatives of Agrium, Agrium's permitting consultant, Agrium's project engineering consultant, and DEQ staff.
- November 14, 2012: ERM, Agrium's permitting consultant, submitted wind roses for the 4year meteorological data set they requested to use in the modeling demonstration via email. This data was obtained from a monitoring site on the Agrium facility property.
- November 28, 2012: ERM submitted additional information in support of the modeling protocol. Emission unit stack location and ambient air boundary diagrams were received by email.
- November 29, 2012: Representatives for Agrium, ERM, andDEQ participated in a conference call to discuss the project and modeling protocol.
- November 29, 2012: DEQ emailed Agrium and ERM EPA's June 22, 2007 memorandum on leased land and ambient air boundary determinations and a discussion on exemption criteria concerning stack distances to an ambient air boundary for the project.
- December 4, 2012: DEQ emailed ERM and Agrium distance information for applying the modeling applicability thresholds and Agrium's modeling setup for the facility and ambient air boundary as requested during a phone conversation earlier that day.
- December 5, 2012: DEQ issued a conditional modeling protocol approval letter to Agrium for the SPA #3 project.
- December 11, 2012: ERM requested that DEQ approve the use of an alternative meteorological dataset in place of the on-site dataset spanning 4 years that was approved in the modeling protocol. Use of a 2004-2008 AERMOD-ready dataset based on on-site meteorological data at the P4 Production facility was requested.
- December 12, 2012: DEQ approved the use of the alternative dataset.
- January 8, 2013: DEQ received the PTC application from Agrium.
- February 6, 2013: DEQ declared the PTC application complete.
- February 28, 2013: DEQ's modeling group provided a modeling memorandumto the air permitting group for the proposed PTC.

2.0 Background Information

2.1 Applicable Air Quality Impact Limits and Modeling Requirements

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

2.1.1 *Area Classification*

The Agrium facility is an existing stationary facility in Caribou County. The area is designated as attainment or unclassifiable for all pollutants

2.1.2 *Significant and Cumulative NAAQS Impact Analyses*

If estimated maximum pollutant impacts to ambient air from the emissions sources associated with the facility 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 for attainment area pollutants involves assessing ambient impacts 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 receptor-by-receptor basis.

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 modeling analyses performed and submitted in the permit application accounted for the new standards.

The annual $PM_{2.5}$ 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's Air Rules.

The $PM_{2.5}$ 24-hour and annual SILs were vacated and remanded by the D.C. Circuit U.S. Court of Appeals, with a decision made on January 22, 2013. This decision most directly affects "major" projects subject to the Prevention of Significant Deterioration (PSD) program (applicable to designated facilities with emissions of a criteria pollutant over 100 tons per year). For minor source permitting, DEQ determined the vacated SILs will still be used as a screening tool to evaluate when a cumulative impact analysis must be performed, but the SIL will not be used exclusively as a level below which impacts of a new source or modification can be considered as not causing or significantly contributing to a $PM_{2.5}$ NAAQS violation. Additional considerations used to evaluate the need for a cumulative impact analysis will included the following: 1) other potentially co-contributing sources in the area; 2) background concentrations for the area impacted; 3) results of the SIL analysis in relation to other sources and background concentrations; 4) presence of sensitive receptors in the area such as residences, schools, hospitals, parks, etc.

Agrium was not required to perform significant impact analyses nor cumulative impact analyses for this project.

Table 2. APPLICABLE REGULATORY LIMITS				
Pollutant	Averaging Period	Significant Impact Levels[a] (μg/m³)[b]	Regulatory Limit[c] (μg/m³)	Modeled Design Value Used[d]
PM_{10}[e]	24-hour	5.0	150[f]	Maximum 6[th] highest[g]
$PM_{2.5}$[h]	24-hour	1.2[i]	35[j]	Mean of maximum 1st highest[k]
	Annual	0.3[i]	15[l]	Mean of maximum 1st highest[k]
Carbon monoxide (CO)	1-hour	2,000	40,000[m]	Maximum 2[nd] highest[n]
	8-hour	500	10,000[m]	Maximum 2[nd] highest[n]
Sulfur Dioxide (SO_2)	1-hour	3 ppb[o] (7.9 μg/m³)	75 ppb[p] (196 μg/m³)	Mean of maximum 4[th] highest[q]
	3-hour	25	1,300[m]	Maximum 2[nd] highest[n]
	24-hour	5	365[m]	Maximum 2[nd] highest[n]
	Annual	1.0	80[r]	Maximum 1[st] highest[n]
Nitrogen Dioxide (NO_2)	1-hour	4 ppb[o] (7.5 μg/m³)	100 ppb[s] (188 μg/m³)	Mean of maximum 8[th] highest[t]
	Annual	1.0	100[r]	Maximum 1[st] highest[n]
Lead (Pb)	3-month[u]	NA	0.15[r]	Maximum 1[st] highest[n]

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 1[st] 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. $PM_{2.5}$ SILs were vacated and remanded as of January 22, 2013.
j. 3-year average of the upper 98[th] percentile of the annual distribution of 24-hour concentrations.
k. 5-year mean of the 1[st] highest modeled 24-hour concentrations at the modeled receptor for each year of meteorological data modeled. The monitoring design value is used for background concentrations for $PM_{2.5}$ analyses. This approach is also used for the significant impact analysis.
l. 3-year average of annual concentration. The NAAQS was revised to 12 μg/m³ 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 in Spring of 2014.
m. Not to be exceeded more than once per year.
n. Concentration at any modeled receptor.
o. Interim SIL established by EPA policy memorandum.
p. 3-year average of the upper 99[th] percentile of the annual distribution of maximum daily 1-hour concentrations.
q. 5-year mean of the 4[th] 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.
r. Not to be exceeded in any calendar year.
s. 3-year average of the upper 98[th] percentile of the annual distribution of maximum daily 1-hour concentrations.
t. 5-year mean of the 8[th] 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.
u. 3-month rolling average.

2.1.3 Toxic Air Pollutant Analyses

Emissions of toxic substances are generally addressed by Idaho Air Rules Seciton 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 animallife 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 noncarcinogenic 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 noncarcinogens 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.

Agrium estimated the TAPs emissions increases for each emissions unit affected by this project.

2.2 Background Concentrations

Background concentrations are used in the cumulative NAAQS impact analyses to account for impacts from sources not explicitly modeled. No background concentrations were provided for this project.

3.0 Modeling Impact Assessment

3.1 Modeling Methodology

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

3.1.1 *Overview of Analyses*

ERM performed site-specific air impact analyses that were determined by DEQ to be reasonably representative of the proposed Agrium facility. 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**
Facility Location	Northeast of Soda Springs	The area is an attainment or unclassified area for all criteria pollutants.
Model	AERMOD	AERMOD with the PRIME downwash algorithm, version 12060.
Meteorological Data	P4 Production Facility On-Site Data	Five years of on-site data obtained by the P4 Production facility for 2004 through 2008.
Terrain	Considered	Receptor, building, and emissions source elevations were determined using USGS 1/3 arc second National Elevation Dataset (NED) files. The NAD83 datum was used for receptors, sources, and structures.
Building Downwash	Considered	Plume downwash was considered for the structures associated with the facility. Agrium and ERM used the BPIP input file from a prior 2006 modeling demonstration supplied by DEQ at ERM's request.
Receptor Grid	Grid 1	25-meter spacing along the boundary and out to at least 500 meters.
	Grid 2	50-meter spacing out to at least 1,500 meters set on Grid 1.
	Grid 3	100-meter spacing out to at least 1,500 meters set on Grid 2.
	Grid 4	250-meter spacing out to 1,500 meters set on Grid 3.

3.1.2 Modeling protocol and Methodology

A modeling protocol was submittedto DEQ prior to the application. The protocol was submitted byERM, on behalf of Agrium, on November 5, 2012, via email.DEQ provided an electronic conditional protocol approval letter via email on December 5, 2012 Site-specific modeling was generally conducted using data and methods described in theprotocol and in the *Idaho Air Quality Modeling Guideline* (State of Idaho Guideline for Performing Air Quality Impact Analyses. Doc. ID AQ011 {rev. 2, July 2011} http://www.deq.idaho.gov/media/355037-modeling-guideline.pdf).

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 sources, Gaussian dispersion model AERMOD was promulgated as the replacementmodel 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 thefacility.

3.1.4 Meteorological Data

ERM's modeling protocolrequested stated that met data collected from an onsite tower would be used for modeling demonstration. The data spanned4 years but the dates of data collection were not specified. Following issuance of DEQ's conditional modeling protocol approval letter, ERM submitted a request via email on December 11, 2012 to use a different meteorological datasetthan 4 year dataset based ondata collected at the Agrium facility. Quality assurance and control requirements for the Agrium onsite data were not met and DEQ agreed with Agrium's request to usean existing P4 Production on-site met dataset. DEQ emailed approval to use the alternative dataseton December 12, 2012.

The alternative met data set was an existing dataset usedfor modeling demonstrations predating this project. ERM had the dataset in-house. The on-site data was collected fora 5-year period, spanning 2004 through 2008, at a met tower located on the P4 Production facility. The onsite data provides surface data.

Pocatello airport data was used to fill in missing data for the surface data file. Boise airport data for 2004 through 2008 was used for the upper air data.

3.1.7 Terrain Effects

ERM 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. Elevations of buildings, stacks, and receptors immediately surrounding the site were determined from the Dynamis site grading plan, since the NED files would not have elevations accounting for site modifications. 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.

NED files are typically in the NAD83 datum and the facility layout is in the same datum. Google Earth uses the WGS84 datum, which is nearly identical to the NAD83 datum, and a spot check of several buildings in the model setup versus Google Earth showed close agreement in location data.

3.1.8 Building Downwash

Potential downwash effects on the emissions plume were accounted for in the model by using building parameters. 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.

DEQ provided ERM with a copy of an Agrium modeling demonstration setup from an earlier 2006 project. The building base elevations for the current project were changed from those used in the 2006 modeling setup. Sources and building locations were included in the AERMAP run but only terrain height extraction was specified in the AERMAP input and output files by ERM. The base elevations for this project's emission sources—Boiler 5 and the Therminol heater stack—match the revised base elevations so building downwash effects are properly accounted for in the submitted analyses.

3.1.9 Ambient Air Boundary

Agrium established the ambient air boundary at the perimeter of property owned and controlled by the facility. Physical restrictions recognized for precluding public access by the Idaho *Air Quality Modeling Guideline*, include a manned gated main entrance, fences, and no trespassing signage. Only the property that Agrium actively controls was treated as exempt from ambient air. Other property external to this project's ambient air boundary is owned by Agrium but some level of access to the property is allowed so the land was treated as ambient air for this project.

The methods proposed to prevent public access within the ambient air boundary satisfy the requirements specified in the *Idaho Air Quality Modeling Guideline*.

3.1.10 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 Emissions Rates

Emissions rates of criteria pollutants and TAPsfor this project were provided by the applicant forvarious applicable averaging periods. DEQ modeling review, described in this memorandum, did not include review of emissions rates for accuracy. DEQ modeling review includd verification thatthe application's potential emissions rates were properly used in the model.

3.2.1 Criteria Pollutant Emissions Rates

No criteria air pollutants were modeled for this projectEmissions of CO, lead, and SO_2, were below the de minim is modeling thresholdsand are listed in Table 4. Emissions of NO_x, $PM_{2.5}$, and PM_{10} associated with the project were all below the Level II modeling thresholdsand are listed in Table 5. DEQ did not require modeling for these pollutants for SIL or cumulative impact analyses.

Table 4. LEVEL I MODELING EXEMPTIONS

Pollutant	Project Emission Rate Increase (lb/hr)[a]	Level I Modeling Threshold (lb/hr)	Project Emission Rate Increase (T/yr)[b]	Level I Modeling Threshold (T/yr)[c]
CO[d]	3.87	15	NA[c]	NA
SO_2[e]	0.016	0.21	0.068	1.2
Pb[f]	NA[g]	NA[g]	0.029	14 pounds per month

a. Pounds per hour.
b. Tons per year.
c. There is no long term averaging period (annual or multiple months) for CO.
d. Carbon monoxide.
e. Sulfur dioxide.
f. Lead.
g. The lead National Ambient Air Quality Standard is based on a rolling 3 month average. Thus, the modeling applicability threshold is based on a monthly period. There is only a Level I modeling threshold for lead.

Table 5. LEVEL II MODELING EXEMPTIONS

Pollutant	Project Emission Rate Increase (lb/hr)[a]	Level I Modeling Threshold (lb/hr)	Level II Modeling Threshold (lb/hr)	Project Emission Rate Increase (T/yr)[b]	Level I Modeling Threshold (T/yr)	Level II Modeling Threshold (T/yr)
NO_x[c]	1.44	0.2	2.4	6.29	1.2	14
$PM_{2.5}$[d]	0.29	0.054	0.63	1.28	0.35	4.1
PM_{10}[e]	0.54	0.22	2.6	NA[f]	NA[f]	NA[f]

a. Pounds per hour.
b. Tons per year.
c. Nitrogen oxides.
d. Particulate matter with a mean aerodynamic diameter of 2.5 microns or less, including condensables.
e. Particulate matter with a mean aerodynamic diameter of 10 microns or less, including condensables.

3.2.2 TAP Emissions Rates

Agrium modeled those TAPs where TAP emissions attributed to this projectexceeded the emissions screening levels (ELs) of Idaho Air Rules Section 585 and 586.Only carcinogenic TAPs regulated under Section 586 of the Rules exceeded the applicable ELs.Table 6 provides modeledemissions rates for TAPs. The Therminol Heater will be a new emissions unit. Boiler 5 is an existing boiler and the TAPs emissions modeled for thisemissions unitwere based on the level of increased utilization of the boilerfor the #3 Superphosphoric Acid project.

Emission rates in the electronic modeling files were based on the emission rates listed in Tabl6 multiplied by a factor of 1 million. Modeling outputfile impact valueswere divided by the factorof 1 million to obtain the final design concentrationslisted in Table 8. The hourly emission rates were modeled continuously for 8,760 hours per year.

Table 6. TAP EMISSIONS MODELED IN ANALYSES		
Pollutant	Emission Unit / Modeling ID	
	Therminol Heater / SPA3_HTR (lb/hr)[a]	Boiler 5 / NEB_BLR (lb/hr)[a]
Formaldehyde	1.88E-03	7.41E-05
Arsenic	5.01E-06	1.98E-07
Cadmium	2.75E-05	1.09E-06
Nickel	5.26E-05	2.07E-06

a. Pounds per hour.

3.3 Emission Release Parameters and Plant Criteria

Table 7 lists emissions release parameters for sources modeledCoordinates are specified in the Universal Transverse MercatorNAD83 system and all sources are located in Zone 12.

Table 7. EMISSIONS RELEASE PARAMETERS								
Release Point	Source Type	UTM[a] Easting (m)[b]	UTM Northing (m)	Base Elevation (m)	Stack Height (m)	Modeled Diameter (m)	Stack Gas Temperature (K)[c]	Stack Gas Flow Velocity (m/sec)[d]
Therminol Heater / SPA3_HTR	Point	455,627.12	4,732,086.68	1877.32	31.95	0.76	566.5	9.81
Boiler 5 / NEB_BLR	Point	455,755.95	4,732,070.9	1878.11	15.85	1.62	427.0	7.60

a. Universal Transverse Mercator
b. Meters.
c. Kelvin.
d. Meters per second.

3.4 Results for Significant Impact Level and National Ambient Air Quality Standards Analyses

Significant Impact Level (SIL) analyses to evaluate whetherthe emissions from the proposed project would significantly contribute to concentrations of criteria pollutants in ambient aiwere not performed NAAQS analyses were not performed.The potential emissions increases of all criteria air pollutants were below the Level I or Level II modeling thresholds.

3.5 Results for Toxic Air Pollutant Analysis

Table 8 presents results for TAP modeling.All TAP impacts were well below the applicable increments

Table 8. RESULTS FOR TOXIC AIR POLLUTANT ANALYSES					
Pollutant	**CAS Number**	**Averaging Period**	**Maximum Modeled Concentration ($\mu g/m^3$)[a]**	**AACC[b] TAP Increment[c] ($\mu g/m^3$)**	**Percent of Increment**
Formaldehyde	50-00-0	Annual	2.98E-04	7.7E-02	0.4%
Arsenic	7440-38-2	Annual	7.93E-07	2.3E-04	0.3%
Cadmium	7440-43-9	Annual	4.36E-06	5.6E-04	0.8%
Nickel	7440-02-0	Annual	8.33E-06	4.2E-03	0.2%

a. Micrograms per cubic meter.
b. Acceptable Ambient Concentration for Carcinogens.
c. Toxic Air Pollutant allowable increment impact listed in Idaho Air Rules Section 586.

4.0 Conclusions

The ambient air impact analyses demonstrated to DEQ's satisfaction that emissions from the facility 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 April 4, 2013:

Facility Comment: SOB Appendix A (page 7 of the pdf) – Table: Total Phosphoric Acid Plant Fluoride Emissions including Wet and SPA Process Lines.

Nu-West requests that the table be deleted in its entirety. The table suggests that permit condition 6.3, which imposes a fluoride limit of 3.8 on phosphoric acid plant, applies to both the phosphoric acid (S-PA-1) and SPA process lines (S-Pb-1). Permit condition 6.3 is based on PTC No. P-2009.00002 (2/20/09), which was issued by the Department for the addition of F-GYP-2. Reviewing the application materials and SOB for PTC No. P-2009.00002 (as well as PTC No. 2007-0170 (12/19/07)), it's clear DEQ intended condition 6.3 to apply only to the phosphoric acid process line (S-Pa-1). In the application materials for F-GYP-2, emissions were calculated from both the phosphoric acid line (3.78 tons per year) and the SPA lines (1.5 tons per year). Nu-West also asserted that the addition of F-GYP-2 would not change acid production and slurry output or fluoride emissions from the plant. The 3.78 tons is based on the phosphoric acid MACT limit of 0.01350 lb/ton of P2O5 times the throughput limit in condition 6.7 of 560,000 equivalent feed tons of P2O5. Since conditions 6.3 and 6.7 do not apply to SPA, the information provided in the table is misleading as it suggests that the 3.8 tons per year fluoride limit does apply to SPA. Nu-West is providing the Department with a page to replace the page with the table to be deleted.

DEQ Response: The table has been replaced to remove the fluoride limit on the SPA process line.

Facility Comment: SOB Section: PSD Classification (40 CFR 52.21) – indicated in Table of Contents as Page 11, although no page numbers in the document), sixth paragraph.

The following statement is made: "Nu-West has elected to use the potential to emit for all pollutants." Nu-West would like to clarify that potential to emit (PTE) was not used for all emission sources. Nu-West used a PTE basis for calculating emissions from the new Therminol Heater based on its rated capacity, for the SPA Oxidation Reactor based on the maximum capacity of SPA 3, and for emissions from the SPA Scrubber based on the maximum capacity of SPA 3 (note for fluorides, the MACT standard limit of 0.0087 lb F per ton equivalent P_2O_5 feed was applied to the maximum design throughput for SPA 3). However, for project-related emissions from the Nebraska Boiler and PPA cooling tower, projected actual emission increases were calculated only for the incremental use of this existing equipment associated with the project. Projected actual emissions from the entire SPA process, including SPA 1, 2, and 3 were estimated by DEQ as the sum of baseline actual emissions of SPA 1 and 2, and PTE of SPA 3.

DEQ Response: The page numbers have been reinserted into the document and a clarification has been made as to the emissions used into the PSD analysis.

APPENDIX D – PROCESSING FEE