Statement of Basis

FINAL

Nu-West Industries
Agrium Conda Phosphate Operations
Soda Springs, Idaho
Facility ID No. 029-00003
Permit to Construct P-2010.0002

March 25, 2010
Dan Pitman, P.E.
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

acfm	actual cubic feet per minute
AFS	AIRS Facility Subsystem
AIRS	Aerometric Information Retrieval System
AQCR	Air Quality Control Region
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
DEQ	Department of Environmental Quality
dscf	dry standard cubic feet
EPA	U.S. Environmental Protection Agency
HAP	hazardous air pollutants
IDAPA	a numbering designation for all administrative rules in Idaho promulgated in accordance with the Idaho Administrative Procedures Act
km	kilometers
lb/hr	pounds per hour
MACT	Maximum Achievable Control Technology
MMBtu	million British thermal units
MMscf	million standard cubic feet
NAAQS	National Ambient Air Quality Standard
NAICS	North American Industry Classification System
NESHAP	National Emission Standards for Hazardous Air Pollutants
NO_2	nitrogen dioxide
NO_X	nitrogen oxides
NSPS	New Source Performance Standards
PC	permit condition
PM	particulate matter
PM_{10}	particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers
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
SIC	Standard Industrial Classification
SIP	State Implementation Plan
SM	synthetic minor
SM80	synthetic minor facility with emissions greater than or equal to 80% of a major source threshold
SO_2	sulfur dioxide
SO_X	sulfur oxides
T/yr	tons per consecutive 12-calendar month period
T2	Tier II operating permit
TAP	toxic air pollutants
T-RACT	Toxic Air Pollutant Reasonably Available Control Technology
UTM	Universal Transverse Mercator
VOC	volatile organic compounds

FACILITY INFORMATION

Description

General Process Description

Phosphate rock, sulfur, and anhydrous ammonia are the primary raw materials used to produce ammonium phosphate fertilizers at the Nu-West Industries, Agrium Conda Phosphate Operations (Nu-West). 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 Nu-West Conda facility produces multiple products and alters its product mix to meet the changing requirements of its customers. The following is a brief description of the products manufactured at the Conda facility.

Super Phosphoric Acid (SPA)

The manufacture of liquid SPA accounts for approximately 50% of the facility's total production volume. It is produced by concentrating phosphoric acid to a level of 68-72% P_2O_5. The use of liquid fertilizer as a percentage of total phosphate fertilizers applied in the domestic U.S. market has grown steadily over the past few years, due to its agronomic, economic, and ecological advantages. SPA is not an end-use fertilizer; rather, it is upgraded, mixed, or blended with other liquid nutrients, pesticides, and/or herbicides before it is applied. As a liquid, it allows for easy and precise application to crops, which makes more nutrients available to the plant. It can be injected below the soil in minimum-till or no-till programs to prevent leaching into waterways.

Merchant Grade Acid (MGA)

Merchant grade acid (MGA), is produced by concentrating phosphoric acid to a level of 50-58% P_2O_5. Like SPA, MGA contains no nitrogen and is generally diluted and mixed with other nutrients before application.

Dilute Phosphoric Acid (DPA)

Dilute phosphoric acid (DPA) is an intermediate stream acid product of the "wet-acid" phosphoric acid process. This product is the feedstock for MGA. It has a P_2O_5 content of approximately 28-30%.

Dry Granular Products (MAP and APS)

The dry granular fertilizer products manufactured by the company are:

- Mono-ammonium Phosphate ("MAP" or 11-52-0)
- Ammonium Phosphate Sulfate ("APS" or 16-20-0)

Permitting History

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

February 20, 2009	PTC No. P-2009.0002 issued as a PTC revision for the West Gyp Stack II project; includes improved monitoring, lower pond size and emission limits (A)
December 19, 2007	PTC No. P-2007.0170 for the initial West Gyp Stack II project (A)
August 22, 2007	PTC No. P-060310, revised PTC SPA Oxidation Process changes and to incorporate granulation plant changes from PTC No. P-060324 (A)
December 21, 2006	PTC No. P-060324, revised PTC issued for drum replacement at the Granulation Plant. This PTC was superseded by PTC No. P-060310 (R).
April 28, 2006	Tier I No. T1-040321,amended permit to incorporate changes in PTC No. P-040320. This permit will be superseded by Tier I No. T1-060311 (A).
April 28, 2006	PTC No. P-040320, production increase at SPA and improved monitoring for the SPA Oxidation Process. This PTC was superseded by PTC P-060310 (R).
April 28, 2006	Tier I No. T1-040321,amended permit to incorporate changes in PTC No. P-040320. This permit will be superseded by Tier I No. T1-060311 (A, pending R).
July 22, 2005	PTC No. P-050312 for the initial West Gyp Stack I project; public notice was per Section 209.05.a, so this PTC will be incorporated into the Tier I during renewal; this PTC was superseded by PTC No. P-2007.0170 (R).
April 8, 2005	Tier I No. T1-040308, modified permit to incorporate changes in PTC No. P-040307. This Tier I permit was superseded by permit No. T1-040321 (R).
December 10, 2004	PTC No. P-040307, for East Sulfuric Acid Plant SO2 monitoring changes (R, Replaced by this permit action)
September 23, 2003	Tier I No. 029-00003, amendment to remove the Experimental Silica Plant (R)
October 28, 2002	Tier I No. 029-00003, Initial Tier I permit (R)
July 12, 2000	PTC No. 029-00003 issued for the Sustaining and Expansion Projects. "Dry" process was converted to "wet" process and Purified P. Acid Plant (PPA) was constructed. This PTC was superseded by PTC No. P-040320 (R).
April 27, 2000	PTC No. 029-00003, amended PTC for the East Sulfuric Acid Plant (R)
February 29, 2000	PTC No. 029-00003 issued for the East Sulfuric Acid Plant; this PTC was superseded by PTC No. 029-00003 issued April 27, 2000 (R)
December 20, 1999	Exemption, R&D Lab Hood determined to be exempt for PTC, P-990154 (A)
August 14, 1996	PTC. Conditions 1.2 and 2.2 of the B-5 Boiler PTC were amended. NOx limit was changed to be the NSPS Subpart Db limit per 40 CFR 60.44b. (A)
April 26, 1996	PTC. Condition 2.1 of the East Sulfuric Acid Plant PTC was revised to clarify daily production limit (R)
January 5, 1996	PTC No 029-00003, modified PTC for East Sulfuric Acid Plant efficiency improvement (R)
July 26, 1995	PTC. Revised page 2 of the B-5 Boiler PTC to correct rated heat input (A)
July 7, 1995	PTC No. 029-00003, modified PTC issued for the Nebraska Boiler (B-5) (A)

April 28, 1995	DEQ issued a PTC exemption concurrence letter for installation of ducting to collect and vent fugitive PM and fluoride emissions from work areas into the emissions control system (A)
March 31, 1995	PTC No. 029-00003 issued for the Nebraska Boiler (B-5) (R)
November 28, 1994	DEQ issued an exemption concurrence letter in response to a PTC application submitted by Nu-West for replacement of an existing 18 MMBtu/hr thermal fluid heater (A)
November 7, 1994	PTC No. 029-00003 issued for B&W B3 Boiler. This boiler was replaced by Nebraska B5 boiler per PTC issued on March 31, 1995 (R).
August 7, 1992	PTC No. 029-00003 issued to Nu-West Industries for the Experimental Silica Plant. This PTC was terminated on August 20, 2003 (R)
September 10, 1985	Revised page 10, correcting combined SO_2 emissions rate from the East and West sulfuric acid plants from 1293 pounds per day to be pounds per hour, was issued to Beker Industries for Operating Permit No 0420-0003 issued on August 30, 1985 (R)
August 30, 1985	Operating Permit No. 0420-0003 issued to Beker Industries for the East and West Sulfuric Acid Plants (R)
August 23, 1985	PTC No. 0420-0003 issued to Beker Industries Corporation – C.F. White Plant, for the new "Cogen I H2SO4 Plant (2800 TPD) Reference #85-003B" (R)
July 18, 1979	Source Permit No. 13-0420-0003-01 issued to Beker Industries for permission to operate sources and control equipment at the Conda facility (R)
July 28, 1975:	Amended consent order submitted as revision to the Idaho state implementation plan by the Governor, 40 CFR 52.670(b)(15).
March 28, 1974:	Second amended consent order issued, which expired after 60 days. Provisions in the amended consent order were revived.
October 24, 1973:	Amended consent order issued for the old (west) and new (east) sulfuric acid plants. Operation of ambient monitors is the only requirement that still applies.

Application Scope

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

Nu-West CPO proposes to replace the No.2 sulfuric acid absorbing tower, which has exceeded its useful life, while maintaining the existing permitted production rate limit of 1,550 tons per day of sulfuric acid for the East Sulfuric Acid Plant. The project involves replacing the brick-lined tower with a new high-silicon stainless steel tower, as well as upgrading the absorbing tower acid pumps and replacing the final absorbing tower heat exchanger. The project also includes installing cesium-promoted catalyst in the final (fourth) converter bed of the tower, replacing the product cooler, upgrading the final cooler, upgrading the cold pass heat exchanger, and maintaining normal operation of the boilers and heaters servicing the acid plant. In order to complete the project, the existing tower exhaust stack will need to be removed. The exhaust stack will be reinstalled once the new tower installation is complete. Replacement will support reliability and maintainability of existing sulfuric acid production at the source, and will not increase sulfuric acid production above the permitted limit of 1,550 tons per day of sulfuric acid. The proposed modification will maintain the existing dual absorption contact process that captures SO_3 in the absorbing towers to produce sulfuric acid. Tower No.2 receives process gases from the final stage of the catalytic converter and exhausts these gases to the atmosphere after removal of the SO_3 produced in the final converter stage. As mentioned above, the existing absorbing tower will be replaced with a high-silicon stainless steel tower to allow the facility to operate without the existing brick lining. The absorbing tower change in material has no impact on the maximum production capacity of the East Sulfuric Acid Plant. As part of this modification, Nu-West CPO is taking this opportunity to proactively install cesium catalyst in the fourth converter bed of the East Sulfuric Acid Plant, including process modifications to enhance cesium catalyst performance. The cesium catalyst is designed to enhance conversion of SO_2 to SO_3 and subsequently to sulfuric acid. Improvements in these conversions which are integral to sulfuric acid production will consequently lower SO_2 emissions from the East Sulfuric Acid Plant and incrementally increase the plants design capacity due to the fact that more sulfur dioxide is converted to sulfuric acid. The use of cesium catalyst is often considered a BACT technology according to numerous entries in EPA's control technology clearinghouse. As part of the design for the tower replacement project, Nu-West CPO commissioned an engineering evaluation which concludes that modifications such as upgrading of the final cooler and upgrades to the cold pass heat exchanger and hot pass heat exchanger would further optimize conversion of sulfur dioxide to sulfuric acid.

Application Chronology

December 31, 2009	DEQ received an application and an application fee
January 22, 2010	DEQ determined that the application was complete
February 23, 2010	DEQ made available the draft permit and statement of basis for applicant review
March 4, 2010	DEQ received comments on the draft permit from Nu-West
March 5, 2010	DEQ received a $1,000 permit processing fee
March 16, 2010	DEQ met with Nu-West on comments provided on draft permit
March 19, 2010	DEQ made available an updated draft permit for Nu-West review
March 23, 2010	DEQ was informed by Nu-West that they had no comments on latest draft

TECHNICAL ANALYSIS

Emissions Units and Control Devices

Table 1 EMISSIONS UNIT AND CONTROL DEVICE INFORMATION

ID No.	Source Descriptions		Control Equipment Descriptions		Emissions Discharge Point ID No. and/or Description
P-SE-1	Name: Manufacturer: Model: Max. capacity: Fuel: Fuel consumption[1]:	East Sulfuric Acid Plant Not Available Not Available 1,550 T/day Elemental Sulfur 508 T/day	Name: Manufacturer:	Dual Absorption Process (using two absorbing towers and 4 catalyst beds; the 4th bed uses cesium catalyst. Not Available	For emission point parameters see DEQ's modeling memo for this project.

Emissions Inventories

Summaries of the emission inventories necessary to satisfy the regulatory requirements for this modification are provided here.

Nu-West Conda Phosphate Operation (Nu-West) is an existing designated facility (phosphate rock processing plant/sulfuric acid plant) which has a potential to emit above 100 tons per year[2] for PM_{10}, SO_2, CO and NO_x. Nu-West is therefore an existing PSD major facility. Any modification to an existing PSD major facility requires calculating baseline actual emissions and projected actual emissions or potential to emit. Emission increases for Nu-West's proposed project are provided in the following tables and are based upon comparison of the baseline emissions to potential to emit for all pollutants, except sulfuric acid mist which is based upon project actual emissions. The emission comparison is needed to determine if the modification is a major modification as described in the regulatory section of this statement of basis.

Table 2 Project Baseline Actual Emissions[a] (T/yr)

Project Sources	SO_2	H_2SO_4	NO_x	PM	PM_{10}	$PM_{2.5}$	H_2S	CO	VOC
East Sulfuric Acid Plant Stack	698	6.85	18.67	9.54	2.39	0.36	-	-	-
Startup- Boilers/Sulfur Warm-up[b]	0	0	0	0	0	0	0	0	0
Cooling Tower	-	-	-	3.37	0.038	0.038	-	-	-
Sulfur Handling & Storage (Fugitive)	-	-	-	-	-	-	13.55	-	-
Total	**698**	**6.85**	**18.67**	**12.91**	**2.43**	**0.398**	**13.55**	**0**	**0**

a) Annual average emission for calendar years 2005 and 2006.
b) Nu-West did not calculate baseline actual emissions.

1 Based on 99.97% conversion of sulfur to sulfuric acid.
2 DEQ Statement of Basis for Tier I Operation Permit No. T1-040324, April 24, 2006.

Table 3 Project Projected Actual Emissions
(Based upon Potential to Emit for all Pollutants, except H_2SO_4)

Project Sources	SO_2	H_2SO_4	NO_x	PM	PM_{10}	$PM_{2.5}$	H_2S	CO	VOC
East Sulfuric Acid Plant Stack	735.5	8.13	25.46	13.01	3.25	0.49	-	-[a]	-[a]
Startup - Boilers/Sulfur Warm-up[b]	3.0E-5	-	5.0E-3	4.0E-4	4.0E-4	4.0E-4	-	4.0E-3	3.0E-4
Cooling Tower	-	-	-	4.77	0.054	0.054	-	-	-
Sulfur Handling & Storage (Fugitive)	-	-	-	-	-	-	18.47	-	-
Total	**735.5**	**8.13**	**25.46**	**17.78**	**3.30**	**0.54**	**18.47**	**4.0E-3**	**3.0E-4**

a) Elemental sulfur is combusted therefore negligible carbon is present
b) Nu-West estimated emissions from an additional 2 days of startup operations above baseline.

Nu-West provided emission inventory calculations in the application. The emission calculations provided by Nu-West are not repeated as part of this statement of basis; refer to the application for details of the emission calculations. Summaries of Nu-West's emission estimates are provided in Table 2 and Table 3 of this Statement of Basis. The summaries provided here in Table 2 and Table 3 matches the emissions estimates calculated by Nu-West. However, the summary of the emission inventories provided by Nu-West in the application do not match the calculations they provided. Following is a discussion of the emission estimates provided by Nu-West. Where necessary a discussion is also provided regarding the discrepancies between the calculations and the summaries that are provided in the application.

East Sulfuric Acid Plant Stack

Baseline sulfur dioxide emissions from the East Sulfuric Acid Plant stack were determined by using continuous emissions monitoring data to determine the annual average emissions for the 2005 and 2006 calendar year period. Sulfuric acid mist and particulate matter emissions were also determined for the 2005 and 2006 calendar year period. Sulfuric acid mist and particulate matter emissions were determined by using emissions factor developed during source testing of the East Sulfuric Acid Plant stack. Nitrogen oxide emissions were estimated for the 2005 and 2006 calendar year period through the use of an emission factor developed from a source test on J.R. Simplot's #400 sulfuric acid plant located in Pocatello, Idaho which is similar to the Nu-West Plant. There are no discrepancies between the applicant's East Sulfuric Acid Plant emissions calculations and summary tables provided in the application.

Details of the emissions calculations may be seen in the application materials. All emission calculations are based on emissions factors in units of pounds per ton of 100% sulfuric acid produced and on an average annual production of 414,878 tons of 100% sulfuric acid for the calendar years 2005 and 2006.

Startup- Boilers/Sulfur Warm-up

During startup of the sulfuric acid plant there is a need to burn natural gas in the waste heat boilers. During normal plant operation heat is generated in the waste heat boilers from combustion of the sulfur and from the exothermic reactions involved with producing sulfuric acid. Nu-West did not calculate baseline actual emissions from natural gas production; therefore for the PSD analysis baseline emissions are presumed to be zero. Nu-West calculated emission increases associated with one additional startup event per year. The startup events are projected to last two days and are projected to consume 99.1 million Btus. Nu-West estimated emissions using US EPA AP-42 emission factors. Estimated emissions do not exceed 5.0 E-3 tons per year for any pollutant and are therefore inconsequential to the regulatory analysis though they were included in the PSD analysis. For the sake of thoroughness it is noted that there is a discrepancy between PSD applicability summary provided in Nu-West's application and the emissions estimates that were provided by Nu-West. The PSD applicability summary is provided in Table 3-5 of the application shows a 0.004 tons per year VOC emission increase for the boilers. The VOC emission increase should have been listed as 0.0003 because this is the actual calculated emission rate. Though inconsequential, this discrepancy is noted here because the DEQ PSD applicability

summary provided in Table 4 of this statement of basis differs from the summary provided by Nu-West in their application (Table 3-5).

Cooling Tower

Nu-West provided emission estimates for particulate matter from the cooling tower. Emission estimates are based on engineering judgment and US EPA AP-42 particle size distribution data. However, Nu-West inadvertently excluded the PM emission data in their PSD summary Table 3-5. PM emissions rates, using Nu-West's information, are 3.37 tons per year for baseline actual emissions and 4.77 tons per year for projected actual emissions. Though inconsequential to the PSD applicability analysis, this discrepancy is noted here because the DEQ PSD applicability summary provided in Table 4 of this Statement of Basis includes these values and therefore differs from the summary provided by Nu-West in their application (Table 3-5).

Fugitive Sulfur Dioxide Emissions

There may be fugitive sulfur dioxide emissions resulting from the use of sulfuric acid downstream from the sulfuric acid plant. This is because small quantities of sulfur dioxide is absorbed in the sulfuric acid and may be available for release upon use of the sulfuric acid. However, the East Sulfuric Acid plant modification project does not include those emission units that use the sulfuric acid as discussed in the PSD regulatory review section of this Statement of Basis. Therefore, even if these emissions occur they are not emitted from units that are included as part of the East Sulfuric Acid plant modification.

Permit Allowable Emissions

Even though Nu-West is proposing a modification to the East Sulfuric Acid Plant there is not an increase of the permitted emissions, or potential to emit, for criteria air pollutants (PM, PM_{10}, $PM_{2.5}$, SO_2, NO_x, CO, VOC, Pb), hazardous air pollutants, or toxic air pollutants as a result of this project. Since there is not an increase in permitted emissions it is not necessary to conduct an emission inventory for hazardous air pollutants or toxic air pollutants.

Ambient Air Quality Impact Analyses

The ambient air impact analysis submitted demonstrated to DEQ's satisfaction that emissions from the facility, as represented by the applicant in the permit application, will not cause or significantly contribute to a violation of any air quality standard. There is not an increase in permit allowable emissions. 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 and is included in Appendix A.

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)

The permittee has requested that a PTC be issued to the facility for the East Sulfuric Acid Plant modification. 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.

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

The Nu-West facility is classified as a major facility, as defined in IDAPA 58.01.01.008.10. Emissions from the facility have the potential to emit greater than 100 tons per year each of PM_{10}, SO_2, NO_X, and CO.

IDAPA 58.01.01.301 ..... Tier I Operating Permit

In accordance with IDAPA 58.01.01.209.05 existing permitted Tier I (Title V) facilities such as Nu-West that submit applications for a permit to construct must specify how the permit to construct will be added to the Tier I permit. Nu-West elected IDAPA 58.01.01.209.05.a which entails adding this permit to construct to the Tier I operating permit at the time of renewal. The facility may construct and operate the facility so long as they do not violate any term or condition of the existing Tier I permit. The permit to construct has been written to assure that compliance with its terms and conditions assures compliance with the existing Tier I permit.

PSD Classification (40 CFR 52.21)

The facility is classified as an existing major stationary source, because the estimated emissions of PM_{10}, SO_2, NO_X, and CO have the potential to exceed 100 tons per year which is the major stationary source threshold. The facility is a designated facility as defined in 40 CFR 52.21(b)(1)(i)(a) because it is a phosphate rock processing plant.

40 CFR 52.21 Prevention of Significant Deterioration of Air Quality

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.

Prior to conducting the applicability test the extent of the project must be determined. In accordance 40 CFR 52.21(b)(52) "project means a physical change in, or change in the method of operation of, an existing major stationary source." Nu-West has proposed physical changes to the East Sulfuric Acid plant which brings that plant and all associated equipment within the scope of the project. However, in order to appropriately determine what constitutes the "project" the following definitions must be used:

> 40 CFR 52.21(b)(52) - Project means a physical change in, or change in the method of operation of, an existing major stationary source.
>
> 40 CFR 52.21(b)(5) - Stationary source means any building, structure, facility, or installation which emits or may emit a regulated NSR pollutant.

From Nu-West's application the following physical changes are occurring to the sulfuric acid plant:

1. No 2 Absorbing Tower Replacement
2. Catalyst Replacement with cesium based catalyst in the 4th catalyst bed
3. Replacement of the final absorbing tower heat exchanger
4. Modifying the cold interpass heat exchanger
5. Upgrading acid pumps
6. Replacing the "common cooler"

All of these proposed physical changes to the sulfuric acid plant are, by definition, part of the proposed project.

Also required to be included in the project are sources which are part of the sulfuric plant installation that are not being physically modified but which could experience emissions increases that result from the

change[3,4]. Nu-West has identified that the following emissions units store or process raw or intermediate materials utilized by the sulfuric acid plant:

1. Boilers and heaters servicing the East Sulfuric Acid Plant; and
2. Elemental sulfur storage and load-out.
3. Sulfuric acid storage.

Nu-West has provided an argument that those emissions units downstream from the sulfuric plant acid storage tanks are not part of the project. This is based on the fact that downstream processes (i.e. fertilizer production) may experience an emissions increase even if the proposed project were not undertaken. Agrium has referenced EPA's "but for" causation test[4] to determine if the downstream processes should be included as part of the project. Under this test Agrium summarizes that emission units that are not physically modified but which could have an increase in emissions are considered to be part of the project (as "debottlenecked emission units") only if those emissions increases could not occur "but for" the project. Historically Nu-West has purchased approximately half of the sulfuric acid used in downstream processes from offsite suppliers; therefore, increasing on-site sulfuric acid production will only offset how much sulfuric acid is purchased for use on-site. Emission changes downstream from the East Sulfuric Acid Plant can not be solely be attributed to the acid plants modification, therefore, downstream emission units are not included as part of the project.

Based on the definition of what constitutes a project, and Nu-West's application, DEQ has determined that the East Sulfuric Acid Plant project includes: the absorbing tower replacement, the catalyst replacement, upgrading cold and hot pass heat exchangers, boiler servicing the acid plant, heaters servicing the acid plant, elemental sulfur storage and handling, and the acid storage tanks. In short, all emissions units in the sulfuric acid plant and support facilities are part of the sulfuric acid plant project.

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)(*c*)(Actual to projected actual test for projects that only involve existing emission units). This is the appropriate test because the changes are to components of the existing sulfuric acid plant. The existing sulfuric acid plant 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 2005 and 2006 for all pollutants. See the emission inventories section of this Statement of Basis for more details.

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3 David Neleigh, Chief, Air Permits Section EPA Region 6. Letter to Dawson Lasseter, Air Quality Division, Oklahoma DEQ, January 27, 2005.

4 R. Douglas Neeley, Chief, Air & Radiation Technology Section, Letter to Rs. Rhonda Banks Thompson, South Carolina Department of Health and Environmental Control, March 14, 1997 ("... when a particular physical change or change in the method of operation would cause an increase in emissions from other emissions units, then those "other" emissions must be included in determining PSD applicability for the particular change.")

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 except sulfuric acid mist. Nu-West's potential to emit, and projected actual emissions for sulfuric acid mist, for the sulfuric acid plant modification project are listed in Table 4 of this Statement of Basis.

As summarized in Table 4 the project does not result in a significant increase and PSD requirements are not triggered.

Table 4 Project Emission Increases & Significant Increase Thresholds

	SO_2	H_2SO_4	NO_x	PM	PM_{10}	$PM_{2.5}$	H_2S	CO	VOC
Baseline Actual Emissions	698	6.85	18.67	12.91	2.43	0.398	13.55	0	0
Projected Actual Emissions	735.5[a]	8.13	25.46[a]	17.78[a]	3.30[a]	0.54[a]	18.47[a]	4.0E-3	3.0E-4
Project Increases	37.5	1.28	6.79	4.87	0.87	0.14	4.92	4.0E-3	3.0E-4
Significant Threshold 40 CFR 52.21(b)(40)	40	7	40	25	15	10	10	100	40

a) Projected actual emissions are equivalent the potential to emit, or the permitted emission, for the East Sulfuric Acid Plant modification project.

In accordance with 40 CFR 52.21(r)(6) the source has an obligation to maintain records, and under certain circumstances provide reports, if there is a reasonable possibility that the project could have caused a significant increase. A reasonable possibility occurs if the source elects to use the methods specified in paragraphs 40 CFR 52.21 (b)(41)(ii)(a) through (c) for calculating projected actual emissions and the emission increase is at least 50% of what is defined as significant. Nu-West elected to use the potential to emit method specified in 40 CFR 52.21(b)(41)(ii)(d) for all pollutants except sulfuric acid mist for which it elected to use projected actual emissions as specified in methods specified in 40 CFR 52.21 (b)(41)(ii)(a) through (c). Sulfuric acid mist emission increases were determined to be less than 19% of what is defined as significant. Since the source used potential to emit for all pollutants except sulfuric acid mist, which emissions increase by less than 50% of what is defined as significant, the source obligation under 40 CFR 521.21(r)(6) does not apply to this project.

NSPS Applicability (40 CFR 60)

The existing facility is subject to the requirements of 40 CFR 60 Subpart H – Standards of Performance for Sulfuric Acid Plants. The proposed changes to the East Sulfuric Acid plant do not alter the current NSPS applicability nor do the changes constitute a modification for NSPS purposes.

40 CFR 60.80 – Standards of Performance for Sulfuric Acid Plants

§ 60.81 Definitions

Nu-West burns elemental sulfur to produce sulfuric acid, therefore it meets the definition of a Sulfuric Acid Plant for NSPS purposes. The proposed changes to the sulfuric acid plant do not constitute a modification for NSPS purposes because they do not result in an emission increase of sulfur dioxide or sulfuric acid mist using the currently available emissions factors used in this permit[5]. No further discussion regarding the definitions is warranted.

5 The addition of cesium catalyst results in a reduction of SO_2 emissions, and the emission factor for sulfuric acid in pounds per ton of 100% sulfuric acid produced does not change.

§ 60.82 Standard for sulfur dioxide

(a) On and after the date on which the performance test required to be conducted by §60.8 is completed, no owner or operator subject to the provisions of this subpart shall cause to be discharged into the atmosphere from any affected facility any gases which contain sulfur dioxide in excess of 2 kg per metric ton of acid produced (4 lb per ton), the production being expressed as 100 percent H_2SO_4.

Nu-West is subject to this sulfur dioxide performance standard and it is included in the permit.

§ 60.83 Standard for acid mist

(a) On and after the date on which the performance test required to be conducted by §60.8 is completed, no owner or operator subject to the provisions of this subpart shall cause to be discharged into the atmosphere from any affected facility any gases which:

(1) Contain acid mist, expressed as H_2SO_4, in excess of 0.075 kg per metric ton of acid produced (0.15 lb per ton), the production being expressed as 100 percent H_2SO_4.

(2) Exhibit 10 percent opacity, or greater.

Nu-West is subject to this acid mist performance standard and it is included in the permit.

§ 60.84 Emission monitoring

Nu-West is subject the emissions monitoring requirements included in this section. All of these emission monitoring requirements are paraphrased in the permit. The permit also specifies that if there is a conflict between the paraphrased requirements of § 60.84, § 60.84 shall govern. The continuous emission monitoring requirements allow for options, it is the intent of the permit to preserve all of those monitoring requirements, including the options, for use at the facilities discretion.

At the time of permit issuance the source is using the following alternative to developing conversion factors used to calculate emission rates:

§ 60.84(d) *Alternatively, a source that processes elemental sulfur or an ore that contains elemental sulfur and uses air to supply oxygen may use the following continuous emission monitoring approach and calculation procedures in determining SO_2 emission rates in terms of the standard. This procedure is not required, but is an alternative that would alleviate problems encountered in the measurement of gas velocities or production rate. Continuous emission monitoring systems for measuring SO_2, O_2, and CO_2 (if required) shall be installed, calibrated, maintained, and operated by the owner or operator and subjected to the certification procedures in Performance Specifications 2 and 3. The calibration procedure and span value for the SO_2monitor shall be as specified in paragraph (b) of this section. The span value for CO_2(if required) shall be 10 percent and for O_2shall be 20.9 percent (air). A conversion factor based on process rate data is not necessary. Calculate the SO_2emission rate as follows:*

$$E_s=(C_sS)/[0.265-(0.0126^6\ \%O_2)-(A\ \%CO_2)]$$

where:

E_s=emission rate of SO_2, kg/metric ton (lb/ton) of 100 percent of H_2SO_4produced.

C_s=concentration of SO_2, kg/dscm (lb/dscf).

S=acid production rate factor, 368 dscm/metric ton (11,800 dscf/ton) of 100 percent H_2SO_4produced.

$\%O_2$=oxygen concentration, percent dry basis.

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6 Corrected from what appears in the CFR. "0.126" was changed to "0.0126" per guidance provided by Zach Klotovich, IDEQ.

A=auxiliary fuel factor =0.00 for no fuel.

$\%CO_2$= carbon dioxide concentration, percent dry basis.

§ 60.85 Test methods and procedures

Since the East Sulfuric Acid Plant is not being modified for NSPS purposes a source test is not required. An initial source test was required not later than 180 days after initial startup. Permitting records show that the East Sulfuric Acid Plant was in existence over 20 years ago.

NESHAP Applicability (40 CFR 61& 63)

The proposed source is not an affected source subject to NESHAP in 40 CFR 61 or 63, and this permitting action does not alter the applicability status of existing affected sources at the facility.

CAM Applicability (40 CFR 64)

40 CFR 64..... Compliance Assurance Monitoring

The general applicability criteria for the Compliance Assurance Monitoring (CAM) program under 40 CFR Part 64 is as follows:

40 CFR 60.2(a). General Applicability Criteria (1) The unit is subject to an emission limitation or standard for the applicable regulated air pollutant (or a surrogate thereof), other than an emission limitation or standard that is exempt under paragraph (b)(1) of this section;

(2) The unit uses a control device to achieve compliance with any such emission limitation or standard; and

(3) The unit has potential pre-control device emissions of the applicable regulated air pollutant that are equal to or greater than 100 percent of the amount, in tons per year, required for a source to be classified as a major source. For purposes of this paragraph, "potential pre-control device emissions" shall have the same meaning as "potential to emit," as defined in §64.1, except that emission reductions achieved by the applicable control device shall not be taken into account.

(b) Exemptions. (1) Exempt emission limitations or standards. The requirement of this part shall not apply to any of the following emission limitations or standards:

(i) Emission limitations or standards proposed by the Administrator after November 15, 1990 pursuant to section 11 or 12 of the Act. (e.g., 40 CFR Part 63 Subparts AA and BB).

(vi) Emission limitations or standards for which a part 70 permit specified a continuous compliance determination method, as defined in § 64.1.

For the East Sulfuric acid plant there are only two pollutants which questions arise regarding CAM applicability. The pollutants are SO_2 and sulfuric acid mist. For both pollutants, Nu-West is exempt from CAM for the following reasons.

Nu-West is exempt from the CAM requirements for SO_2 under 40 CFR 60.2(b)(vi) because the permit, and NSPS Subpart H, require the use of a continuous emission monitor for SO_2.

With regard to the sulfuric acid mist eliminator at the sulfuric acid plant, this device is determined to be inherent process equipment, as defined at 40 CFR 64.1, and not a control device. The mist eliminator is a design feature that serves to passively limit emissions.

The mist eliminators installed at the east sulfuric acid plant are inherent process equipment as defined under the CAM rule, and therefore do not meet the definition of control device for the purpose of CAM

applicability to the NSPS sulfuric acid mist limit. "Inherent process equipment" is defined in § 64.1 as follows:

> . . . equipment that is necessary for the proper or safe functioning of the process, or material recovery equipment that the owner or operator documents is installed and operated primarily for purposes other than compliance with air pollution regulations. Equipment that must be operated at an efficiency higher than that achieved during normal process operations in order to comply with the applicable emission limitation or standard is not inherent process equipment. For the purposes of this part, inherent process equipment is not considered a control device.

Consistent with this definition, in the preamble to the CAM rule[7], EPA identified three criteria for distinguishing inherent process equipment from control devices for the purpose of CAM applicability.

(1) Is the primary purpose of the equipment to control air pollution? No. The sulfuric acid plant was originally constructed in 1964 and included installation of mist eliminators. The primary purposes for installing an acid mist eliminator are to prevent acid from attacking the metal equipment downstream and to capture product.

(2) Where the equipment is recovering product, how do the cost savings from the product recovery compare to the cost of the equipment? The mist eliminators are inherent process equipment because they are a design element that is necessary for the proper and safe functioning of the plant and for product recovery. Sulfuric acid is extremely corrosive to metal and if not removed would damage downstream equipment (e.g., heat exchangers and duct work). The mist eliminators' recovery of sulfuric acid also is important from an economic perspective. The current mist eliminators can recover approximately 62 pounds per ton of acid produced -- up to the permitted production level of 1,550 tons per day. That recovered acid is available for sale at an estimated price of $44 per ton. Although some form of mist eliminator would be needed to meet the NSPS sulfuric acid mist limit, existence of that limit was not the reason for original installation of original mist eliminators (which pre-dated the NSPS) or the selection of the current high efficiency mist eliminators, which control sulfuric acid beyond what is necessary to meet the NSPS limit. The cost savings in terms of product recovery and equipment protection (reducing maintenance/equipment costs) are significant, and CPO would operate the current mist eliminators and their design efficiency regardless of the NSPS limit.

(3) Would the equipment be installed if no air quality regulations are in place? Yes, mist eliminators are, and were historically, utilized by the plant to recover product and to extend the useful life of the metal equipment downstream in the plant. Mist eliminator efficiencies have improved over time to enhance product recovery.

Permit Conditions Review

The existing permit conditions are included below in italicized font, following each existing permit condition any changes made to the condition is discussed.

1. EMISSION LIMITS

1.1 <u>Sulfur Dioxide Emissions from the East Sulfuric Acid Plant</u>

1.1.1 Sulfur dioxide emissions shall not exceed four pounds per ton of 100% sulfuric acid production, as specified in 40 CFR 60.82(a).

Remains unchanged except that all NSPS permit conditions are consolidated in one section of the permit.

1.1.2 Sulfur dioxide emissions shall not exceed 258 lb/hr and 945 tons per any consecutive 12-month period.

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7 62 FR 54940, October 22, 1997

The facility requested a sulfur dioxide potential to emit limitation reduction from 945 tons per year to 735.5 tons per year to be consistent with the PSD applicability determination for the proposed modification. The hourly emission rate limit remains unchanged. The pound per hour and ton per year emission rate limits are now included in the permit in table format instead of sentence format. The tons per year emission limitation is equivalent to a sulfur dioxide emission rate of 2.6 pounds per ton of 100% sulfuric acid produced.

The potential to emit for PM, PM-10, H_2S and NOx are inherently limited by the daily production limit of 1,550 tons per day. Specific emission rate limits are not needed for PM, PM-10 and NOx because the emissions increases do not exceed 20% of what is defined as significant, and because the application certified that the ambient impact from the emissions increases[8] are less than the significant impact levels. H_2S emissions are from fugitive sources and emission rate limits are not practically enforceable. H_2S emissions are inherently limited by the sulfuric acid plants production limit of 1,550 tons per day; this is a practically enforceable limit and is a surrogate for H_2S emissions limits.

PM and PM-10 emission estimates provided in the application are based on source tests conducted on the East Sulfuric acid plant. NOx emissions estimates were obtained through the use of emission tests on similar facilities. Hydrogen sulfide emissions estimates we obtained through the use of a Material Safety Data Sheet that gave the concentration of hydrogen sulfide in sulfur shipments to the facility.

The PSD analysis projected sulfuric acid emissions increases of 1.28 tons per year, which is below the 7 ton per year significant emission rate threshold. The production rate is limited to 1,550 tons per day, or 565,750 tons per year. This production limitation along with historical tested emission rates[9] of sulfuric acid mist reasonably assures emissions do not exceed the 7 ton per year significant emission rate threshold.

1.2 Sulfuric Acid Mist Emissions from the East Sulfuric Acid Plant

Sulfuric Acid mist emissions from the East Sulfuric Acid Plant shall not exceed 0.15 lb per ton of 100% sulfuric acid production, as specified in 40 CFR 60.83(a)(1).

Remains unchanged except that all NSPS permit conditions are consolidated in one section of the permit (Conditions 13-17).

1.3 Visible Emission Limits

Visible emission limits from the East Sulfuric Acid Plant shall not exceed 10% opacity as specified in 40 CFR 60.83(a)(2).

Remains unchanged except that all NSPS permit conditions are consolidated in one section of the permit (Conditions 13-17).

2. OPERATING REQUIREMENTS

2.1 Production Rate

The East Sulfuric Acid Plant shall have a maximum daily production rate of 1,550 tons per day.

Remains unchanged, except that the condition is renumbered to Permit Condition 9.

2.2 NSPS Operating Requirements

The permittee shall operate the East Sulfuric Acid Plant in accordance with the operating requirements of 40 CFR Part 60 Subpart H.

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8 As determined between baseline actual emissions and the potential to emit.

9 December 11, 2007 – 0.033 lb H_2SO_4/ T 100% lb H_2SO_4; December 14, 2008 – 0.04 lb H_2SO_4/ T 100% lb H_2SO_4; November 18, 2009 – 0.03 lb H_2SO_4/ T 100% lb H_2SO_4

Remains unchanged except that all NSPS permit conditions are consolidated in one section of the permit (Conditions 13-17).

3. MONITORING REQUIREMENTS

3.1 Performance Tests

3.1.1 Sulfur dioxide and sulfuric acid mist emission tests shall be performed during each 13-month period of the permit term using U.S. EPA Reference Methods 1, 2, 3, and 8, or DEQ approved alternative methods. All emission tests shall be performed at the process equipment's maximum operating capacity.

The first sentence of this permit condition remains unchanged. The second sentence has been deleted; the permit now requires source testing to be conducted in accordance with General Provisions 30, 31, and 32.

General Provision 31 requires that source testing be conducted in accordance with IDAPA 58.01.01.157. §157 requires testing to be conducted under "worst-case normal conditions".

3.1.2 Visible emissions shall be observed and recorded with the emissions test required in Section 4.1 of this Permit, using U.S. EPA Reference Method 9. A minimum of 24 observations shall be recorded.

Remains unchanged except is renumbered to Permit Condition 12.

3.1.3 The maximum production following each emission test shall not exceed 105% of the rate achieved during the test unless the following conditions are met, and this rate shall not exceed 1550 tons per day:

3.1.3.1 The sulfur dioxide monitor is calibrated at least once every 24 hours using certified test gases, one of which has a sulfur dioxide concentration equal or less than the expected stack gas sulfur dioxide concentration, and one of which has a sulfur dioxide concentration greater than the expected stack gas sulfur dioxide concentration.

3.1.3.2 Prior written approval by DEQ is received.

3.1.3.3. An emission test is performed at the requested increased production rate, and the test demonstrates that the continuous emission monitor is accurate at the increased rate.

3.1.3.4 Sulfur dioxide and acid mist emission limits will not be violated at the requested increased production rate.

Section 3.1.3, and all subcategories, have been deleted from the permit. This permit condition stated that production is limited to 105% of the value achieved during the source test unless the "following conditions" are met. Agrium has certified that historically they have always operated under the "following conditions" including the 1,550 production limit. Operating under the "following conditions" of the terms of the permit negates the limitation on production to 105% of the production obtained during the test.

Source testing is now required to be conducted at "worst case normal" operating conditions. Since source testing is conducted under worst case conditions the permittee may operate up to the maximum permitted production rate of 1,550 tons per day after any source test. This is consistent with the *Rules for the Control Pollution in Idaho* (IDAPA 58.01.01.157) and DEQ's *Source Test Guidance Manual* located on DEQ's web page. As agreed during DEQ's March 16, 2010 meeting with Agrium, operating under these conditions is not considered a violation of the existing Tier I permit conditions.

3.2 CEMS Requirement

The permittee shall install, calibrate, maintain and operate a continuous emission monitoring system for the measurement of sulfur dioxide emissions, as described in 40 CFR 60.84 and 60.13. The accuracy of the monitoring results shall be in accordance with 40 CFR 60, Appendix B, Performance Specification 2.

Remains unchanged, except that all NSPS permit conditions are consolidated in one section of the permit (Conditions 13-17).

3.3 Production Monitoring

Each day, the permittee shall monitor and record the production of the East Sulfuric Acid Plant in tons/day.

Remains unchanged, except is renumbered to Permit Condition 11.

3.4 SO_2 Hourly and Annual Emission Rate Monitoring

Using the CEMS required under Permit Condition 3.2, the permittee shall monitor and record the SO_2 emissions from the East Sulfuric Acid Plant to demonstrate compliance with Permit Condition 1.1.2, as specified below:

- *in pounds per hour; and*
- *in tons for each consecutive 12-month period;*

This permit condition has been enhanced. It now clearly specifies how emission rates are to be calculated. These requirements are included in Permit Condition 10.

3.5 Other NSPS Monitoring Requirements

The permittee shall comply with any and all other pertinent NSPS monitoring requirements as listed in 40 CFR Part 60 Subpart H.

This permit condition has been enhanced by paraphrasing the NSPS monitoring requirements instead of simply providing a high level citation to the requirements; in addition all NSPS requirements are consolidated into one section of the permit (Conditions 13-17).

3.6 Monitoring and Recordkeeping

All monitoring records and support information shall be retained for a period of at least five years from the date of the monitoring sample, measurement, report, or application. Supporting information includes, but is not limited to, all calibration and maintenance records, all original strip-chart recordings for continuous monitoring instrumentation, and copies of all reports required by this permit. All records required to be maintained by this permit shall be made available in either hard copy or electronic format to DEQ.

This permit condition is redundant with Tier I permit recordkeeping requirements therefore it is not repeated in this permit.

4. REPORTING REQUIREMENTS

4.1 Performance Test Protocol

The permittee shall submit for approval to DEQ a source test protocol for the tests required in Section 3.1 of this Permit. The test protocol shall be submitted to DEQ no later than 30 days prior to the date of the initial performance test. Once the test protocol is approved by DEQ, the permittee shall conduct all subsequent source tests in accordance with the approved protocol. The permittee may submit a new test protocol for review and approval in the event that there is any change in the protocol. The new test protocol shall be approved by DEQ prior to any testing conducted in accordance with the new protocol.

This permit condition remains in the permit. It now simply states that the test shall be conducted in accordance with a DEQ approved protocol and is included in Permit Condition 12. The facility has requested that modified permit does not violate any existing Tier I permit conditions so that the permit can be processed in accordance with IDAPA 58.01.01.209.05.a and allow the source to operate the source after permit issuance; otherwise the requirement to submit a protocol would have been deleted.

4.2 ***Performance Test Results***

The data and results of all emissions tests shall be reported to DEQ within 30 days of the completion of the tests. The report shall also include continuous emission monitoring data, production rates, and visible emissions data.

This permit condition is redundant with the reporting requirements of the General Provisions of the Permit and has been deleted.

4.3 ***Sulfur Dioxide Emissions Report***

All three-hour running average sulfur dioxide emissions and quarterly emissions of sulfur dioxide mist shall be reported to DEQ in a calendar-quarterly report. The quarterly emissions of sulfuric acid mist shall be calculated by using the most recent source test emission factor multiplied by the production rate. The report shall be received by DEQ no later than 30 days after each calendar quarter.

The modified permit continues to require quarterly reporting of all three-hour rolling (running) average sulfur dioxide emissions. The requirement to calculate and report quarterly and annual emissions of sulfuric acid mist has been deleted from the permit. This is because the existing permit, and the modified permit, does not limit sulfuric acid mist emissions on a quarterly or annual basis. Sulfuric acid mist is limited in the existing, and modified permit, on a pounds per ton of 100% sulfuric acid basis. The PSD analysis projected sulfuric acid emissions increases of 1.28 tons per year, which is below the 7 ton per year significant emission rate threshold. The production rate is limited to 1,550 tons per day, or 565,750 tons per year. This production limitation along with historical tested emission rates[10] of sulfuric acid mist reasonably assures emissions do not exceed the 7 ton per year significant emission rate threshold.

4.4 ***CEMS Report***

All repairs or changes to the continuous emissions monitoring systems (CEMS) and any calibration problem shall be reported to DEQ within seven days and shall be included in the quarterly report.

Remains unchanged, except is renumbered and included in Permit Condition 10. The facility has requested that modified permit does not violate any existing Tier I permit conditions so that the permit can be processed in accordance with IDAPA 58.01.01.209.05.a and allow the source to operate the source after permit issuance without violating the existing Tier I permit.

4.5 ***Other NSPS Reporting Requirements***

The permittee shall comply with any and all pertinent reporting requirements as listed in 40 CFR Part 60 Subpart H. All NSPS Subpart H reporting requirements are included in the permit.

All NSPS Subpart A requirements, including reporting requirements, will be included in the renewed Tier I operating permit that is currently being processed.

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. On January 15, 2010 the Idaho Conservation League (ICL) requested a public comment period. On January 19, 2010 ICL withdrew its request for a comment period. No other requests were received for a comment period.

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10 December 11, 2007 – 0.033 lb H_2SO_4/ T 100% lb H_2SO_4; December 14, 2008 – 0.04 lb H_2SO_4/ T 100% lb H_2SO_4; November 18, 2009 – 0.03 lb H_2SO_4/ T 100% lb H_2SO_4

APPENDIX A – MODELING MEMO

MEMORANDUM

DATE: January 26, 2010

BY: Darrin Mehr, Air Quality Analyst, Air Program

PROJECT NUMBER: P-2010.0002

SUBJECT: Modeling Demonstration for Nu-West Industries, Inc. (also referred to as Agrium) PTC Application for a Proposed Replacement of the No. 2 Absorbing Tower in the East Sulfuric Acid Plant at Their Nu-West Conda Phosphate Operations Facility near Conda, Idaho

1.0 Summary

Nu-West Industries, Inc. (NWI) submitted an application for a PTC to modify the existing East Sulfuric Acid Plant. The application is for a minor modification. The requested potential emissions are to remain below the major source thresholds for criteria air pollutants regulated under the Prevention of Significant Deterioration (PSD) program.

This modeling analysis was based on the permit application and modeling files received on December 31, 2009. This project's modeling analysis also utilizes information from the PSD permit application, which was officially withdrawn on December 21, 2009, and the modeling protocol and DEQ approval letter for that project. Please refer to the permit statement of basis to review a complete history for this project.

The NWI facility is a *designated facility*, as defined in IDAPA 58.01.01.006, Rules for the Control of Air Pollution in Idaho (Rules). The facility's potential to emit (PTE) of particulate matter with an aerodynamic diameter of ten microns or less (PM_{10}), sulfur dioxide (SO_2), carbon monoxide (CO), and nitrogen oxides (NO_x) each are greater than 100 tons per year (T/yr). The NWI facility is therefore a major facility under the New Source Review (NSR) PSD program.

The proposed project is subject to review under Section 200 of the Rules. Section 203.02 of the Rules requires the facility to demonstrate compliance with the National Ambient Air Quality Standards (NAAQS). Section 210 of the Rules requires the facility to demonstrate compliance with the toxic air pollutants (TAPs) increments, which are listed in Sections 585 and 586 of the Rules.

The modeling analyses: 1) utilized appropriate methods and models; 2) were conducted using reasonably accurate or conservative model parameters and input data; 3) adhered to established DEQ guidelines for new source review dispersion modeling; 4) showed that predicted pollutant concentrations from emissions associated with the facility were below significant contribution levels or other applicable increments/standards at all ambient air locations. The modeling analysis was performed by Environmental Resources Management, on behalf of NWI.

Key assumptions and results that should be considered in the development of the permit are shown in Table 1.

Table 1. KEY ASSUMPTIONS USED IN MODELING ANALYSES	
Criteria/Assumption/Result	**Explanation/Consideration**
There will be a net reduction in annual SO_2 emissions from the current 945 T/yr limitation to the requested annual limitation of 735.5 T/yr. Future potential emissions of all other pollutants are anticipated to either remain equal to current potential emissions or be less than current potential emissions.	For minor source permitting, the modeling analysis regards the difference between the future potential emissions and the current potential emissions as the metric for determining whether a modeling threshold has been exceeded. It does not appear that the emissions of any regulated air pollutant associated with this permit action will increase. Therefore, an approved modeling analysis was not required to be performed prior to issuance of the PTC. Permitting staff has verified that there will be no increase in potential emissions as a result of this project. The ambient impacts presented in this memorandum were reviewed by DEQ for informational purposes only.
The exhaust release height of the No. 2 Absorption Tower Stack will be 125.9 feet above grade not the 110 feet used in this modeling analysis. A previous 2006 facility-wide modeling demonstration submitted by NWI used a stack release height of 125 feet. A reduction in stack height could trigger the requirement to model emissions of criteria air pollutants according to short-term and annual potential to emit limitations to verify that NAAQS compliance is assured.	The modeling submitted with this application used a release height of 110 feet. It was corrected by email communication received on January 11, 2010, and the stack release height will be 125 feet and 10 5/8th inches high (125.9 feet). The modeling files submitted with the application should be conservative because they used a lower stack height. All impacts modeled by Nu-West Industries were below significant contribution levels.

2.0 Background Information

2.1 Applicable Air Quality Impact Limits and Modeling Requirements

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

2.1.1 Area Classification

The NWI facility is located in Caribou County, which is designated as an attainment or unclassifiable area for sulfur dioxide (SO_2), nitrogen dioxide (NO_2), carbon monoxide (CO), lead (Pb), ozone (O_3), and particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers (PM_{10}).

There are no Class I areas within 10 kilometers of the facility.

2.1.2 Significant and Full Impact Analyses

If estimated maximum pollutant impacts to ambient air from the emissions sources at the facility exceed the significant contribution levels (SCLs) of Section 006.102 of the Rules, then a full impact analysis is necessary to demonstrate compliance with Section 203.02. A full impact analysis for attainment area pollutants involves adding ambient impacts from facility-wide emissions, and emissions from any identified co-contributing sources, to DEQ-approved background concentration values that are appropriate for the criteria pollutant/averaging-time at the facility location and the area of significant impact. The resulting maximum pollutant concentrations in ambient air are then compared to the National Ambient Air Quality Standards (NAAQS) listed in Table 2. Table 2 also lists SCLs and specifies the modeled value that must be used for comparison to the NAAQS.

Table 2. CRITERIA AIR POLLUTANTS APPLICABLE REGULATORY LIMITS				
Pollutant	**Averaging Period**	**Significant Contribution Levels[a] ($\mu g/m^3$)[b]**	**Class II NAAQS Regulatory Limit[c] ($\mu g/m^3$)**	**Modeled Value Used[d]**
PM_{10}[e]	Annual	1.0	50[f]	Maximum 1st highest[g]
	24-hour	5.0	150[h]	Maximum 6th highest[i]
Carbon monoxide (CO)	8-hour	500	10,000[j]	Maximum 2nd highest[g]
	1-hour	2,000	40,000[j]	Maximum 2nd highest[g]
Sulfur Dioxide (SO_2)	Annual	1.0	80[f]	Maximum 1st highest[g]
	24-hour	5	365[j]	Maximum 2nd highest[g]
	3-hour	25	1,300[j]	Maximum 2nd highest[g]
Nitrogen Dioxide (NO_2)	Annual	1.0	100[f]	Maximum 1st highest[g]
Lead (Pb)	Quarterly	NA	1.5[f, k]	Maximum 1st highest[g]

[a] Idaho Air Rules Section 006.102
[b] Micrograms per cubic meter
[c] National Ambient Air Quality Standards specified by Idaho Air Rules Section 577 for criteria pollutants
[d] The maximum 1st highest modeled value is always used for significant impact analysis
[e] Particulate matter with an aerodynamic diameter less than or equal to a nominal ten micrometers
[f] Never expected to be exceeded in any calendar year
[g] Concentration at any modeled receptor
[h] Never expected to be exceeded more than once in any calendar year.
[i] Concentration at any modeled receptor when using five years of meteorological data
[j] Not to be exceeded more than once per year
[k] Measured as total suspended particulates

2.1.3 TAPs Analyses

The increase in emissions from the proposed project are required to demonstrate compliance with the toxic air pollutant (TAP) increments, with an ambient impact dispersion analysis required for any TAP having a requested potential emission rate that exceeds the screening emission rate limit (EL) specified by Idaho Air Rules (Rules) Section 585 or 586.

This project is for an existing facility. Any TAP emissions increases associated with this project are subject to the requirements of the TAPs regulations. The analyses submitted in the application and supplemental addenda included a TAPs compliance demonstration per the requirements of Section 210 of the Rules. A compliance demonstration was included for emission increases requested with this permitting action. Only non-carcinogenic TAPs regulated by Section 585 of the Rules were expected to increase. No increase in carcinogenic TAPs emissions, which are regulated by Section 586 of the Rules, was requested.

2.2 Background Concentrations

Background concentration values were not requested by the applicant for this project. The submitted analyses provide ambient impacts below significant impact levels (SILs). Therefore, formal facility-wide modeling and background concentration values were not needed for this project's modeling demonstration.

3.0 Modeling Impact Assessment

3.1 Modeling Methodology

Table 3 provides a summary of the modeling parameters used in the submitted modeling analyses.

Table 3. MODELING PARAMETERS		
Parameter	**Description/ Values**	**Documentation/Additional Description**
Model	AERMOD	AERMOD, Version 09292
Meteorological data	2006	DEQ provided 2005, 2006, and 2007 met data sets to AECOM. The 2006 year of data was used in this modeling demonstration.
Land Use (urban or rural)	Rural	Urban heat rise coefficients were not used. DEQ agrees with NWI's assessment that a rural land use designation is appropriate.
Terrain	Considered	3-dimensional receptor coordinates were obtained from files obtained from the USGS National Elevation Data (NED) database.
Building downwash	Downwash algorithm	AERMOD, Version 09292, uses BPIP-Prime and the PRIME algorithms to evaluate structure-induced downwash effects.
Receptor grid	Grid 1	25-meter spacing along the ambient air boundary
	Grid 2	100-meter spacing at a distance of 1km meters surrounding the facility.
	Grid 3	500-meter spacing from 1 km to 5 km in a grid surrounding the ambient air boundary of the facility.
	Grid 4	1000-meter spacing in a nested grid centered on the facility extending from 5 km to 15 km from the ambient air boundary.

3.1.1 Modeling protocol

A modeling protocol was submitted to DEQ by AECOM, Inc., on May 4, 2009 in support of a PSD PTC application. The PSD application was subsequently withdrawn by NWI. This modeling protocol was approved by DEQ with comments.

A separate modeling protocol was not submitted for this minor source PTC project. Submittal of a modeling protocol is not required by the Idaho Air Rules for minor source PTC projects. However, the December 31, 2009 permit application references the PSD project's DEQ-approved modeling protocol and the conference call in which DEQ and AECOM participated in April of 2009. Therefore it assumed that relevant portions of the modeling protocol and the protocol approval are still in effect for this minor source PTC application.

Modeling was conducted using methods documented in the modeling protocol and the *State of Idaho Air Quality Modeling Guideline*.

3.1.2 Model Selection

AERMOD, Version 09292, was used by NWI to conduct the ambient air analyses for NAAQS and TAPs compliance demonstrations.

3.1.3 Meteorological Data

Environmental Resources Management (ERM) performed the ambient air dispersion modeling analyses for this project to demonstrate compliance with NAAQS and TAPs increments on behalf of NWI. The current application's modeling report references a modeling protocol submitted by AECOM, Inc., on behalf of NWI, for determining the representativeness of the meteorological (met) data. A new modeling protocol was not submitted by NWI or their consultant, ERM, for the current permit project. The AECOM protocol was submitted in support of a previous PSD PTC permit application. The PSD permit application contained the documentation requested by DEQ in the protocol approval letter for validation of the met data used in the modeling analyses. This documentation including a review and discussion of the representativeness and a detailed review of the quality assurance/quality control measures for the 2006 met data set. Hourly observations were reviewed for each of the 3 tower monitor heights (10-, 37-, and 65-meters). In addition, the PSD application provided thorough and well-presented documentation on

assumptions and information used to determine input parameters for the AERSURFACE program that calculates input parameters for met data processing using the AERMET met data processor. It is assumed by DEQ that this supporting data contained in the withdrawn PSD PTC application is representative of the contents of NWI's current minor source PTC application since the withdrawn application specifically addresses DEQ modeling protocol approval comments.

DEQ provided AECOM with 3 years (2005, 2006, and 2007) of met tower monitoring data that was gathered by P4 Production, LLC at their facility's on-site met tower which is located approximately 3 miles southwest of the NWI facility. NWI used a single year of met data (2006) for the modeling demonstration, and they conducted a quality assurance/quality control (QA/QC) review of the data used in analysis, per DEQ's request. The data was determined to meet QA/QC requirements. Of the 10-, 37-, and 65-meter data available in the dataset, only the 10-meter data was used as input data in AERMET for the surface data component. Salt Lake City, Utah data was used as for the upper air data inputs to AERMET.

3.1.4 Terrain Effects

The modeling analyses conducted by ERM considered elevated terrain. The elevation of each receptor was obtained from United Geological Survey (USGS) digital elevation map (DEM) files for the area surrounding the facility. Elevations for emission sources and buildings were determined by NWI.

3.1.5 Facility Layout

DEQ verified proper identification of the facility boundary and buildings on the site by comparing the modeling input file layout to Google Earth images, Figure 5-2 of the withdrawn PSD PTC application, and the scaled aerial photograph of the facility contained in Figure A-3 of the August 10, 2006 facility-wide modeling demonstration for PTC projects.

3.1.6 Building Downwash

Plume downwash effects caused by structures at the facility were accounted for in the modeling analyses. The Building Profile Input Program-Plume Rise and Building Downwash Model (BPIP-PRIME) was used by the applicant to calculate direction-specific building dimensions and Good Engineering Practice (GEP) stack height information from building dimensions/configurations and emissions release parameters. The output from BPIP-PRIME was used as input to AERMOD, Version 09292, to account for building-induced downwash effects.

3.1.7 Ambient Air Boundary

Ambient air was determined to exist for all areas immediately exterior to the facility's property boundary. The modeling protocol described a fenceline around the entire facility perimeter to prohibit access by any member of the general public. A fenced property boundary is sufficient to establish as the ambient air boundary, in accordance with the methods specified in the *State of Idaho Air Quality Modeling Guideline.*

3.1.8 Receptor Network

The receptor grids used by NWI met the minimum recommendations specified in the *State of Idaho Air Quality Modeling Guideline.* DEQ determined the receptor grid was adequate to reasonably resolve the maximum modeled ambient impacts.

3.2 Emission Rates

3.2.1 Modeled Emission Rates

Emissions rates used in the dispersion modeling analyses submitted by the applicant were reviewed against those in the permit application. The following approach was used for NWI's modeling demonstration:

- All modeled criteria air pollutant and TAP emissions rates were equal to or greater than the facility's emissions calculated in the PTC application and the requested permit allowable emission rates listed in the air quality permit.

Table 4 lists the hourly emission rates that were modeled to demonstrate compliance with the significant contribution levels (SCLs) with annual averaging periods. The emission rates listed in the table below were modeled continuously for 8,760 hours per year.

Table 4. MODELED ANNUAL AVERAGE EMISSIONS RATES

Source ID	Description	Emission Rates (lb/hr[a])		
		PM_{10}[b]	SO_2[c]	NO_x[d]
ESAPMAIN	East Sulfuric Acid Plant—Absorption Tower No. 2	0.20	8.56	1.55

[a] Pounds per hour
[b] Particulate matter with an aerodynamic diameter less than or equal to a nominal ten micrometers
[c] Sulfur dioxide
[d] Nitrogen dioxide

The non-carcinogenic toxic air pollutant (TAP) 24-hour average emission rates listed below in Table 5 were modeled to demonstrate compliance with the applicable acceptable ambient concentration (AAC) increment. Emissions of all other TAPs were estimated to be below emissions screening levels (ELs) listed in Sections 585 and 586 of the Rules, and air impact analyses were not required. The emission rates were modeled continuously for 24 hours per day without any restriction on emission rate or hours of operation.

Table 5. MODELED NON-CARCINOGENIC TOXIC AIR POLLUTANTS EMISSIONS RATES

Source ID	Description	Sulfuric Acid Mist (SAM) (lb/hr[a])	Hydrogen Sulfide (H_2S) (lb/hr)
ESAPMAIN	East Sulfuric Acid Plant—Absorption Tower No. 2	0.29	NA[b]
SLOADING	Sulfur Loading Operation	NA[b]	1.13

[a] Pounds per hour
[b] Pollutant not emitted by this source

3. 3 Emission Release Parameters

3.3.1 Point Sources

Table 8 provides emissions release parameters, including stack height, stack diameter, exhaust temperature, and exhaust velocity for point sources. DEQ compared the exhaust parameters used in this modeling analysis to the 2006 facility-wide modeling demonstration performed by Kleinfelder, on behalf of NWI. The exhaust parameters used in this analysis were identical to those used in the 2006 analysis except for the stack height of the East Sulfuric Acid Plant No. 2 Absorption Tower. The stack height was reduced by 15 feet to a proposed height of 110 feet (33.5 meters) in the submitted modeling analysis, but this height was corrected a to 125.9 feet by email communication. Modeling is not required for the 0.9 foot increase in stack height that will occur for this project.

This stack's modeled exit velocity was 11.5 m/s. The permit application contained a 2003 test using EPA Reference Methods 1-4, which revealed the tested exit velocity was 87% of the value used in the modeling (10.0 m/s versus 11.5 m/s). DEQ staff also looked at source test documentation compiled by DEQ's Technical Services Group on the results and pertinent information derived from submitted source tests. The Technical Services review of multiple source tests from 2005 to 2008 confirmed all modeled exhaust parameters for the sulfuric acid plant stack including the exhaust velocity.

Values used in the analyses appeared reasonable and within expected ranges for the assumptions used in the submitted analyses.

Table 8. POINT SOURCE STACK PARAMETERS

Release Point	Description	Stack Height (m)[a]	Stack Gas Flow Temperature (K)[b]	Stack Gas Flow Velocity (m/sec)[c]	Stack Diameter (m)
ESAPMAIN	East Sulfuric Acid Plant No. 2 Absorption Tower Stack	38.4	348	11.5	2.29

[a] Meters
[b] Kelvin
[c] Meters per second

3.3.3 Volume Sources

Volume source exhaust parameters are listed below in Table 9, and were accepted as submitted in the application.

Table 9. VOLUME SOURCE RELEASE PARAMETERS

Release Point	Description	Release Height (m[a])	Initial Horizontal Dispersion Coefficient, σ_{y0} (m)	Initial Vertical Dispersion Coefficient, σ_{z0} (m)
SLOADING	Sulfur Loading Operation	3.05	7.09	0.71

[a] Meters

3.4 Results for Ambient Impact Analyses

3.4.1 Significant Impact Analyses

A significant impact analysis was performed by NWI for this project. There will be no difference in short-term emissions limits when comparing current potential emissions to future potential emissions. Therefore, modeling for carbon monoxide 1-hour and 8-hour NAAQS and SO_2 3-hour and 24-hour NAAQS was not performed.

See the discussion in Table 1 to review DEQ's interpretation of any requirement to perform a significant impact analysis.

Table 10. RESULTS OF SIGNIFICANT CONTRIBUTION IMPACT ANALYSES				
Pollutant	**Averaging Period**	**Predicted Ambient Impact ($\mu g/m^3$)[c]**	**Significant Contribution Level ($\mu g/m^3$)**	**Full Impact Analysis Required?**
SO_2[d]	3-hour	NA[g]	25	No
	24-hour	NA[g]	5	No
	Annual	0.73	1.0	No
NO_2[e]	Annual	0.13	1.0	No
PM_{10}[f]	24-hour	0.18	5.0	No
	Annual	0.02	1.0	No

[a] Micrograms per cubic meter per gram per second of emissions
[b] Grams per second
[c] Micrograms per cubic meter
[d] Sulfur dioxide
[e] Nitrogen dioxide
[f] Particulate matter with an aerodynamic diameter less than or equal to a nominal ten micrometers
[g] NA-no increase in emissions for this "project" under this averaging period

3.4.2 Full Impact Analyses

A full impact analysis was not performed by NWI for this project. Impacts attributed to the project's increase in emissions were less than the applicable significant contribution levels so a full impact analysis is not required.

3.4.3 Toxic Air Pollutant Impact Analyses

Dispersion modeling for TAPs was required to demonstrate compliance with TAP increments specified by Idaho Air Rules Section 585. No increase in TAPs emissions with an annual averaging period (carcinogenic TAPs) was requested for this project. NWI modeled the emissions increase in TAPs resulting from the comparison of future actual emissions to current actual emissions. Modeling of the TAPs is not triggered if future potential emissions equal current potential emissions from this source.

A compliance demonstration for sulfuric acid mist (SAM) is not required for this project. The results presented by NWI were included for information only. Any TAP that is regulated by a New Source Performance Standard (NSPS) is exempt from the requirement to demonstrate preconstruction compliance for that TAP, in accordance with Section 210.20 of the Idaho Air Rules for TAPs, and 40 CFR 60 Subpart Cd , which is the NSPS for "sulfuric acid production units."

The results of the TAPs analyses are listed in Table 11. The predicted ambient TAPs impacts were below allowable increments.

Table 11. RESULTS OF TAPs ANALYSES				
Toxic Air Pollutant	**CAS No.[a]**	**Maximum Modeled Concentration ($\mu g/m^3$)[b]**	**AAC[c] ($\mu g/m^3$)**	**Percent of AAC**
Noncarcinogenic TAPs – 24-hr avg				
Sulfuric Acid Mist (SAM)	7664-93-9	0.27	50	0.5%
Hydrogen Sulfide (H_2S)	7783-06-4	64.3	700	9%

[a] Chemical Abstract Service Number
[b] Micrograms per cubic meter
[b] Acceptable ambient concentration for non-carcinogens

4.0 Conclusions

The ambient air impact analysis submitted demonstrated to DEQ's satisfaction that emissions from the facility, as represented by the applicant in the permit application, will not cause or significantly contribute to a violation of any air quality standard.

APPENDIX B – PERMIT FEES

PTC Fee Calculation

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

Company: Nu-West, Conda Phosphate
Address:
City: Soda Springs
State: Idaho
Zip Code:
Facility Contact: Jim Cagle
Title: EHS Manager
AIRS No.: 029-00003

N Does this facility qualify for a general permit (i.e. concrete batch plant, hot-mix asphalt plant)? Y/N

Y Did this permit require engineering analysis? Y/N

N Is this a PSD permit Y/N (IDAPA 58.01.01.205.04)

Emissions Inventory

Pollutant	Annual Emissions Increase (T/yr)	Annual Emissions Reduction (T/yr)	Annual Emissions Change (T/yr)
NO_x	0.0	209.5	-209.5
SO_2	0.0	0	0.0
CO	0.0	0	0.0
PM10	0.0	0	0.0
VOC	0.0	0	0.0
TAPS/HAPS	0.0	0	0.0
Total:	0.0	209.5	-209.5
Fee Due	$ 1,000.00		

Comments: There is no increase in permitted emissions due to this modificaiton.

APPENDIX C – FACILITY DRAFT COMMENTS

Permit Condition 6. (Emission Limits)

Nu-West commented that emission limits were not needed for PM, PM-10 and NOx. Nu-West provided that the potential to emit was inherently limited by the sulfuric acid production limitation of 1,550 tons per day. DEQ agreed and removed emission rate limits for these pollutants. For additional information see the Statements of Basis Section on Permit Conditions Review, specifically item 1.1.1.

Permit Condition 10. (Compliance with SO_2 Limits)

The draft permit provided 6 bullet items in Permit Condition 10. The first 3 bullets repeated NSPS provisions provided in Permit Conditions 13-17. Nu-West requested to eliminate this redundancy. DEQ agreed and removed the first 3 bullet items.

Permit Conditions 19 -21 (Source Obligation)

The draft permit included Source Obligation requirements of 40 CFR 52.21(r)(6). Nu-West provided comments that the requirements are not applicable. DEQ agreed and removed the provisions from the permit. For additional information see the Statements of Basis Section on PSD.

Modifying the Tier I permit to include the revised PTC

Nu-West originally requested that the PTC be included in the Tier I through an administrative amendment as specified in IDAPA 58.01.01.209.05.c. Upon further evaluation Nu-West elected to include the PTC in the Tier I permit at the time of renewal in accordance with IDAPA 58.01.01.209.05.a. The PTC has been written so that compliance with terms of the PTC will also assure that a violation of the Tier I permit does not occur; this allows the source to construct and operate the source in accordance with IDAPA 58.01.01.209.05.a.iii.