State of Idaho
Department of Environmental Quality
Air Quality Division

**AIR QUALITY PERMIT**
**STATEMENT OF BASIS**

# Permit to Construct No. P-2008.0199

**Final**

**U.S. Department of Energy Idaho Operations Office (DOE-ID)**
**Idaho National Laboratory (INL)**
**Idaho Nuclear Technology and Engineering Center (INTEC)**
**Integrated Waste Treatment Unit (IWTU)**

**Idaho Falls, Idaho**

**Facility ID No. 023-00001**

**August 31, 2009**

**Shawnee Chen, P.E.** SYC

**Senior Air Quality Engineer**

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

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# Acronyms, Units, and Chemical Nomenclature

| | |
|---|---|
| AAC/AACC | acceptable ambient concentration |
| AFS | AIRS Facility Subsystem |
| AIRS | Aerometric Information Retrieval System |
| CAA | Clean Air Act |
| CAM | compliance assurance monitoring |
| CFR | Code of Federal Regulations |
| CO | carbon monoxide |
| CRR | Carbon Reduction Reformer |
| DEQ | Department of Environmental Quality |
| DMR | Denitration and Mineralization Reformer |
| DOE-ID | U.S. Department of Energy Idaho Operations Office |
| EPA | U.S. Environmental Protection Agency |
| EL | screening emissions levels |
| ft | feet |
| gal/yr | gallon per year |
| HAP | hazardous air pollutant |
| HEPA | high efficiency particulate air |
| IDAPA | a numbering designation for all administrative rules in Idaho promulgated in accordance with the Idaho Administrative Procedures Act |
| INL | Idaho National Laboratory |
| INTEC | Idaho Nuclear Technology and Engineering Center |
| IWTU | the Integrated Waste Treatment Unit |
| lb/hr | pounds per hour |
| MACT | Maximum Achievable Control Technology |
| $\mu g/m^3$ | micrograms per cubic meter |
| NESHAP | National Emission Standards for Hazardous Air Pollutants |
| Ni | nickel |
| $NO_x$ | nitrogen oxides |
| NSPS | New Source Performance Standards |
| 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 |
| PSD | Prevention of Significant Deterioration |
| PTC | permit to construct |
| Rules | Rules for the Control of Air Pollution in Idaho |
| $SO_2$ | sulfur dioxide |
| $SO_x$ | sulfur oxides |
| SOB | statement of basis |
| TAP | toxic air pollutant |
| T/yr | tons per year |
| Zn | zinc |

# 1. FACILITY INFORMATION

## 1.1 Facility Description

Approximately 900,000 gallons of mixed liquid waste, containing both hazardous and radioactive components, are stored in three 300,000-gallon tanks at the Tank Farm Facility at the Idaho Nuclear Technology and Engineering Center (INTEC). This waste is collectively known as sodium-bearing waste. A steam reforming process was selected to treat this waste. The specific steam reforming technology incorporated into the Integrated Waste Treatment Unit (IWTU) is a dual fluidized-bed process that uses superheated steam, carbon, and other additives to convert the sodium-bearing waste into a solid, granular treatment product that is packaged into canisters suitable for ultimate disposal. The process is named the Integrated Waste Treatment Unit because two fluidized-bed steam reformers are integrated into a single treatment process with a common air pollution control system.

## 1.2 Permitting Action and Facility Permitting History

This permitting action is a minor modification to an existing PSD major stationary source. The facility's permitting history can be found in the Statement of Basis for the facility's Tier I operating permit that can be found at DEQ's website at http://www.deq.idaho.gov/air/permits_forms/permitting/t1_permits_final_current.cfm.

# 2. APPLICATION SCOPE AND APPLICATION CHRONOLOGY

## 2.1 Application Scope

The applicant has requested to reduce the annual feed rate of the IWTU from 1,236,000 gallons per year to 1,114,000 gallons per year. The new annual feed rate ensures that the $NO_X$ increase of the IWTU project maintains below 40 tons per year, the significant level for $NO_X$ for a major source modification. Based on newly available information on $NO_X$ carryover from the Denitration and Mineralization Reformer (DMR), reduction of the annual feed rate becomes necessary to avoid PSD review for $NO_X$ for the IWTU project.

The applicant has also requested to revise the process description and the emissions control in existing PTC No. P-060520, issued on May 3, 2007, to reflect changes of the filters' design specifications and configurations.

This permitting action is a revision to PTC No. P-060520 issued on May 3, 2007. This permitting action does not qualify as "modification" in accordance with IDAPA 58.01.01.006.63 because there is not physical change in, or change in the method of operation of, a stationary source or facility, and the source has not completed construction yet. Therefore, when conducting emissions estimation, ambient impact analysis, and regulatory analysis for this permitting action, the applicant is required to look at emissions from the entire IWTU project rather than only look at emissions increase due to newly available information and specifications change to not yet built equipment.

The IWTU project is a minor modification to an existing PSD major stationary source (i.e., INL).

## 2.2 Application Chronology

| | |
|---|---|
| December 3, 2008 | DEQ received PTC application |
| January 2, 2009 | DEQ determined the application to be incomplete |
| March 30, 2009 | DEQ received application supplement |
| April 20, 2009 | DEQ received additional information on emissions calculations |
| April 29, 2009 | DEQ declared the application complete |
| June 25, 2009 | DEQ issued the draft permit for applicant review |
| July 6, 2009 | DEQ received PTC processing fee of $2,500 |
| July 7, 2009 | DEQ emailed the proposed permit to the applicant |

# 3. TECHNICAL ANALYSIS

## 3.1 Emission Unit and Control Device

**Table 3.1 EMISSION UNIT AND CONTROL DEVICE INFORMATION**

| Emissions Unit(s) / Process(es) | Emissions Control Device | Emissions Point |
|---|---|---|
| IWTU consists of :<br>• Denitration and Mineralization Reformer<br>• Carbon Reduction Reformer (CRR)<br>• Treatment Product Transfer and Loadout System | Process HEPA Filter System | IWTU stack<br>Stack height: 120 ft<br>Exit diameter: 5 ft<br>Exit temperature: 144°F<br>Exit velocity: 59 ft/second (estimated) |

## 3.2 Emissions Inventory

Emissions increases from what were permitted under PTC No. P-060520 issued on May 3, 2007 for $PM/PM_{10}$, $SO_2$, $NO_X$, lead, Ni, and Zn are caused by:

- The applicant has newly available information on the feed liquid.
- The applicant modifies the specifications of the process filters which have not been built yet.

The emissions estimations for $PM/PM_{10}$, $SO_2$, $NO_X$, lead, Ni, and Zn have been reviewed for this permitting action. Emissions estimations for other unchanged air pollutants are not reviewed because they were reviewed for PTC No. P-060520 issued on May 3, 2007.

Table 3.2 EMISSIONS INCREASE OF CRITERIA POLLUTANTS FROM THE IWTU PROJECT

| Emissions Unit | $PM_{10}$ | | $SO_2$ | | NOx | | CO | | Ni | Zn | LEAD |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | lb/hr, max | T/yr | lb/hr, max (annual average) | T/yr | lb/hr, max (annual average) | T/yr | lb/hr, max | T/yr | lb/hr, max | lb/hr, max | ton/yr |
| IWTU [1] | 0.16 [7] | 0.44 | 3.83 (2.32) [6] | 10.15 [5] | 12.4 (7.50) [3] | 32.86 [4] | 0.23 [8] | 0.61 | 0.258 | 0.121 | 7.24E-05 |
| Boilers [2] | --- | 0.35 | --- | 13.9 | --- | 6.53 | --- | 1.63 | --- | --- | --- |
| **Total** | --- | 0.79 | --- | 24.05 | --- | **39.4** | --- | 2.24 | --- | --- | --- |

[1] Emissions rates are taken from Table 2 of the application unless otherwise stated. The throughput limit for the IWTU project is 1,114,000 gal/yr of liquid waste fed.

[2] The steam for the IWTU project is provided by the existing oil-fired boilers in Building CPP-606, permitted in PTC No. P-030505, issued on January 21, 2004. Boilers emissions increases due to increasing utilization are taken from the Statement of Basis for PTC No. P-060520, issued on May 3, 2007. The IWTU project does not affect PTC No. P-030505 issued on January 21, 2004 for the boilers.

[3] Max. NOx lb/hr = (5.89 mole/l-nitrate in waste)(3.5 gal/min)(3.785 l/gal)(60 min/hr)(0.08 DMR carryover)(0.50 CRR carryover)(30.0 g/mole NOx)=5,620g/hr = 12.39 lb/hr (taken from p.1 of March 30, 2009 submittal). Annual avg. NOx lb/hr = [12.4 lb/hr x 1,114,000 gal/yr / (3.5 gal/min * 60 min/hr)] / (8,760 hr/yr) = 7.50 lb/hr, NOx annual avg.

[4] [(5,620g/hr NOx)(1,114,000 gal/yr)]/[(3.5 gal/min)(60 min/hr)(453.6 g/lb)(2000 lb/T)]=32.86 T/yr NOx (taken from p.1 of March 30, 2009 submittal)

[5] {(5.44E-02 mole-$SO_4$ /l)(3.785 l/gal)(1,114,000 gal/yr)(64.06 g/mole-$SO_2$ )( 1 lb/453.6 g)(0.005)+(0.012046) (3.15 lb/hr-coal)(l, 114,000 gal/yr)/[(3.5 gal/min)(60 min/hr)]}(1 T/2000 lb)=10.15 T/yr $SO_2$ . (taken from p.2 of March 30, 2009 submittal. More details are provided in the same document)

[6] $SO_2$ lb/hr, max = 10.15 T/yr * 2000 lb/T / [1,114,000 gal/yr /(3.5 gal/min * 60 min/hr)] = 3.83 lb/hr. $SO_2$ lb/hr, annual avg. = 10.15 T/yr * 2000 lb/T / 8,760 hr/yr = 2.32 lb/hr, annual avg.

[7] 0.436 T/yr * 2000 lb/T / [1,114,000 gal/hr / (3.5 gal/min * 60 min/yr)] = 0.436 T/yr * 2000 lb/ton / (5,305 hr/yr) = 0.164 lb/hr $PM_{10}$, max.

[8] CO lb/hr, max = 0.61 T/yr *2000 lb/T/[1,114,000/ (3.5 gal/min * 60 min/hr)]= 0.23 lb/hr

## 3.3 Ambient Air Quality Impact Analysis

According to DEQ's modeling guidance and DEQ modeling memo found in Appendix B, the facility has demonstrated compliance to DEQ's satisfaction that the IWTU project will not cause or significantly contribute to a violation of any ambient air quality standard. The supporting data are:

- The emissions increase due to the IWTU project is below respective modeling threshold for $PM_{10}$ and CO, as specified in DEQ's modeling guidance.
- Ambient impacts for $SO_2$ and $NO_2$ are below significant contribution levels for all relevant averaging periods.
- Emissions increments of TAPs or their ambient impacts due to the IWTU project do not exceed ELs, AACs, or AACCs.

Table 3.3 summarizes ambient impact from TAPs exceeding their respective ELs.

**Table 3.3 FULL IMPACT ANALYSIS RESULTS FOR TAPS**

| TAP | Averaging Period | Maximum Modeled Concentration ($\mu g/m^3$)[a] | AAC/AACC[b] ($\mu g/m^3$) | Percent of AAC/AACC |
|---|---|---|---|---|
| **Non-Carcinogenic TAPs** | | | | |
| Aluminum (soluble salts) | 24-hour | 11.7 | 100 | 12% |
| Calcium Oxide | 24-hour | 2.45 | 100 | 2% |
| Chlorine | 24-hour | 0.46 | 150 | 0.3% |
| Chromium III | 24-hour | 0.19 | 25 | 0.8% |
| Fluoride | 24-hour | 0.089 | 125 | 0.07% |
| Hydrochloric Acid | 24-hour | 0.47 | 375 | 0.1% |
| Mercury (vapor) | 24-hour | 0.96 | 2.5 | 38% |
| **Carcinogenic TAPs** | | | | |
| Arsenic | Annual | 1.39E-06 | 2.3E-04 | 0.6% |
| Beryllium | Annual | 4.45E-07 | 4.2E-03 | 0.01% |
| Cadmium | Annual | 3.26E-07 | 5.6E-03 | 0.006% |
| Nickel | Annual | 7.66E-04 | 4.2E-03 | 18% |

[a] Micrograms per cubic meter
[b] Acceptable ambient concentration /acceptable ambient concentration for carcinogens

Detailed ambient air quality analysis can be found in the modeling memorandum in Appendix B and the Statement of Basis for PTC No. P-060520 issued on May 3, 2007.

# 4. REGULATORY REVIEW

## 4.1 Attainment Designation (40 CFR 81.313)

The facility is located in Butte County which is designated as attainment or unclassifiable for $PM_{10}$, $PM_{2.5}$, CO, $NO_2$, $SO_X$, and Ozone. Reference 40 CFR 81.313.

## 4.2 Permit to Construct (IDAPA 58.01.01.201)

The proposed IWTU project does not meet the permit to construct exemption criteria contained in Sections 220 through 223 of the Rules; therefore, a PTC is required.

## 4.3 Tier II Operating Permit (IDAPA 58.01.01.401)

INL has not applied for a Tier II operating permit; therefore, this program does not apply.

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

INL is classified as a major facility under Title V program. The applicant has requested an administrative amendment to Tier I operating permit No. T1-060521, issued on October 23, 2007, to incorporate PTC requirements for this permitting action in accordance with IDAPA 58.01.01.209.05.c.

## 4.5 PSD Classification (40 CFR 52.21)

INL is a major source under PSD program. This permitting action is a minor modification to a PSD major source because the applicant has requested an emissions increase for NOx from the ITWU project to be less than significant, 40 tons per year.

## 4.6 NSPS Applicability (40 CFR 60)

This permitting action does not trigger any new NSPS requirements.

## 4.7 NESHAP Applicability (40 CFR 61)

This permitting action does not trigger any new NESHAP requirements.

## 4.8 MACT Applicability (40 CFR 63)

This permitting action does not trigger any new MACT requirements.

## 4.9 CAM Applicability (40 CFR 64)

This permitting action does not trigger any new CAM requirements.

## 4.10 Permit Conditions Review

This section describes only those permit conditions (PC) that have been added, revised, modified or deleted as a result of this permitting action. The added text is in bold, and the deleted text is text with strike out.

4.10.1 Permit Conditions 1.1 through 1.3 state the purpose of this permitting action and which PTC is to be replaced.

4.10.2 Permit Condition 1.4 lists regulated sources in this permit and their controls in Table 1.1 of the permit.

| Permit Section | Source Description | Emissions Control(s) |
|---|---|---|
| 2 | **IWTU consists of**<br>• Denitration and Mineralization Reformer (DMR)<br>• Carbon Reduction Reformer (CRR)<br>• Treatment Product Transfer and Loadout System<br><br>**ID: STK-SRE-140**<br>**Manufacturer: CH2M-WG, LLC**<br>**Maximum capacity: 3.5 gallons per minute design waste feed rate** | Process HEPA filter system<br><br>**ID: F-SRH-140-A/-B/-C/-D**<br>**Control efficiency: 99.97% for $PM/PM_{10}$ per DOE-STD-3020-05**<br>~~Building Ventilation HEPA Filter System~~ |

4.10.3 Changes are made to PCs 2.1 and 2.2 to reflect filters configuration change.

"2.1 ....

.... The IWTU air pollution control system includes the Process HEPA Filter system (which is located downstream from the DMR and CRR) ~~and the Building Ventilation HEPA Filter system~~."

"2.2...

| **Emissions Unit(s) / Process(es)** | Emissions Control Device | Emissions Point |
|---|---|---|
| **IWTU consists of** :<br>• Denitration and Mineralization Reformer<br>• Carbon Reduction Reformer (CRR)<br>• Treatment Product Transfer and Loadout System | Process HEPA filter system<br>~~Process HEPA Filter System~~<br>~~Building Ventilation HEPA Filter System~~ | **IWTU stack: 120 ft height; 5 ft exit diameter; 144°F exit temperature, and 59 ft/second estimated exit velocity**<br>~~IWTU stack~~ |

4.10.4 Permit Condition 2.4 limits NOx emissions increase of the IWTU project to be less than NOx significant level of 40 tons per year to avoid PSD review.

"2.4 $NO_x$ Emissions Limit

**The NOx emissions increase from the IWTU project shall not exceed 39.4 tons per any consecutive 12-month period.**

~~The $NO_x$ emissions from the IWTU stack shall not exceed any corresponding emission rate limit listed in the table below.~~

~~Table 2.2 IWTU $NO_x$ EMISSIONS LIMIT[a]~~

| ~~Emission Point~~ | ~~$NO_x$ T/yr~~ |
|---|---|
| ~~IWTU Stack~~ | ~~32~~ |

~~[a] The permittee shall not exceed the T/yr listed based on any consecutive 12-month period.~~

**[8/21/09]**

~~[IDAPA 58.01.01.211.01, 5/1/94]~~ "

4.10.5 The reduced annul liquid feed rate replaces the old feed rate to ensure that $NO_x$ emissions increase of the IWTU project does not exceed 40 tons per year of $NO_x$ significant level for PSD.

"2.6…

The ~~annual feed~~ **throughput** rate of liquid waste fed into the IWTU shall not exceed ~~1,236,000~~**1,114,000** gallons per **any** consecutive 12-month period ~~(gal/yr)~~.

**[~~IDAPA 58.01.01.211.01, 5/1/94~~8/21/09]**"

410.6 PC 2.8 is replaced with "**Reserved.**" Because of the filters configuration change, Building Ventilation HEPA Filter System will not be installed.

4.10.7 PC 2.12 is revised because of the filters configuration change - Building Ventilation HEPA Filter System will not be installed. It reads:

"…record the pressure drop across the HEPA filter stages of the Process HEPA Filter System ~~and the Building Ventilation HEPA System~~ according to…

**[IDAPA 58.01.01.211.01, 5/1/94 (State-only Requirement), 8/21/09]**"

4.10.8 A monitoring requirement to demonstrate compliance with $NO_x$ emissions limit in PC 2.4 is added to the permit as new PC 2.13.

"2.13 **Monitoring $NO_x$ emissions increase of the IWTU project**

**Within three months of the issuance of this permit or prior to initial startup of the source, whichever comes first, the permittee shall have developed and obtained DEQ's approval of a monitoring method to be used to demonstrate compliance with Permit Condition 2.4. The method shall require the permittee to monitor and record the following for each calendar month:**

- **Monthly boilers $NO_x$ emissions increase caused by the IWTU operation**
- **Monthly $NO_x$ emissions from the IWTU stack**
- **The monthly sum of these two emissions increase**
- **Using the monthly sum of these two emissions, calculate and record the $NO_x$ emissions for the IWTU project for each consecutive 12-month period.**

**[8/21/09]**"

4.10.9 Old PC 2.13 is renumbered as PC 2.14.

4.10.10 General Provisions are replaced with the General Provisions taken from current PTC template.

## 5. PERMIT FEES

Table 5.1 lists the processing fee associated with this permitting action. In accordance with IDAPA 58.01.01.225, the facility is subject to a processing fee of $2,500 because emissions increase from previously permitted level is within the range of one to ten tons. Refer to the chronology for fee receipt dates.

**Table 5.1 PROCESSING FEE TABLE**

| Pollutant | Annual emissions of IWTU permitted under PTC No. P-060520, issued on May 3, 2007 (T/yr)[1] | Annual emissions of IWTU permitted under this permitting action (T/yr) | Annual emissions change (T/yr) |
|---|---|---|---|
| $NO_X$ | 31.77 | 32.86 | 1.09 |
| $SO_2$ | 5.2 | 10.15 | 4.95 |
| CO | 1.44 | 0.61 | -0.83 |
| $PM_{10}$ | 0.04 | 0.44 | 0.4 |
| VOC | 0 | 0 | 0 |
| HAPS | 0 | 0 | 0 |
| **Total:** | **38.45** | **44.06** | **5.61** |
| Fee Due | **$2,500.00** | | |

## 6. PUBLIC COMMENT

The applicant has requested to process this permitting action in accordance with IDAPA 58.01.01.209.05.c. A public comment period for the draft PTC was provided.

A public comment period was made available to the public and affected state from July 14, 2009 to August 13, 2009. During this time, comments were not submitted in response to DEQ's proposed action.

The draft permit was also provided for EPA review from July 14, 2009 to August 28, 2009 in accordance with IDAPA 58.01.01.366 according to IDAPA 58.01.01.209.05.c.iv. During this time, EPA did not comment on DEQ's proposed action.

# Appendix A – AIRS Information

# AIRS/AFS Facility-wide Classification – Data Form

**Facility Name:** U.S. Department of Energy Idaho Operations Office (DOE-ID), Idaho National Laboratory (INL), Idaho Nuclear Technology and Engineering Center (INTEC), Integrated Waste Treatment Unit (IWTU)

**Facility Location:** Idaho Falls

**Facility ID:** 023-00001 **Date:** August 31, 2009

**Project/Permit No.:** P-2008.0199 **Completed By:** Shawnee Chen

☒ Check if there are no changes to the facility-wide classification resulting from this action. (compare to form with last permit)

Comments: This permitting action does not change the facility-wide classification. However, the AIRS table in current Tier I operating permit (i.e., Tier I No. T1-030520 issued on June 28, 2005) has "B" for $SO_2$. It should be "A" for $SO_2$. Please make correction to the AIRS.

☒ **PSD** [ 6 ] - Yes, this facility has a PSD permit.

Comments: No changes made to the pollutants applying to PSD.

# Appendix B – Ambient Air Quality Impact Analysis

# MEMORANDUM

**DATE:** June 3, 2009

**TO:** Shawnee Chen, P.E., Permit Writer, Air Program

**FROM:** Darrin Mehr, Air Quality Analyst, Air Program

**PROJECT NUMBER:** P-2008.0199

**SUBJECT:** Modeling Review for the Idaho National Laboratory Permit to Construct Revisions for the Integrated Waste Treatment Unit at their facility near Idaho Falls, Idaho

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## 1.0 Summary

The Idaho National Laboratory (INL), located near Idaho Falls, Idaho, submitted an application for a Permit to Construct (PTC) for the construction and operation of the Integrated Waste Treatment Unit (IWTU) on December 3, 2008. The application was declared incomplete on January 2, 2009. DEQ received a response to the incompleteness determination on March 30, 2009, which included a revised modeling demonstration.

The IWTU will process sodium bearing radioactive waste that is in a liquid form for the purpose of transforming the liquid waste to a solid waste for placement in containers. The containers are to be transported off-site to a permanent repository. This facility was issued a PTC for its original design on May 3, 2007. This project addresses changes to the design of the IWTU and requested emission and operation limits for the permit based on revised information from actual operating observations at the Hazen pilot plant. This PTC action will entirely replace the original PTC.

AERMOD has replaced ISCST3 as the regulatory guideline model for predicting ambient impacts since the initial PTC was issued. AERMOD was required to be used for this analysis because this project was determined to qualify as a separate stand-alone project and DEQ required the analysis to use the current regulatory guideline model. The application and modeling demonstration include a compliance demonstration with criteria air pollutants and toxic air pollutants (TAPs).

A technical review of the submitted air quality analyses was conducted by DEQ. The submitted modeling analyses in combination with DEQ's staff analyses: 1) utilized appropriate methods and models; 2) was 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, when appropriately combined with background concentrations, were below applicable air quality standards at all receptor locations. Table 1 presents key assumptions and results that should be considered in the development of the permit.

| Table 1. KEY ASSUMPTIONS USED IN MODELING ANALYSES | |
|---|---|
| **Criteria/Assumption/Result** | **Explanation/Consideration** |
| Emission rates for TAPs which are emitted as particulates, lead, and $PM_{10}$ have been altered from the original PTC. These changes are being processed as a PTC that will entirely replace the original 2006 PTC.<br><br>• Changes to process flow design affecting the emissions control efficiencies by filtration systems were accounted for in revised emission estimates and modeled emission rates for some pollutants.<br><br>• Emissions of nickel and zinc were stated in the application materials as being uncontrolled by any process or final HEPA filtration systems.<br><br>• Lead emissions were calculated at 7.24E-05 tons/yr and were assumed to be controlled by process filtration systems only. | INL's compliance demonstration for TAPs and criteria air pollutants reflected an overall 1,114,000 gallon per year throughput. Carcinogenic TAP compliance was demonstrated using the 5,305 hours per year of operation, which is the number of hours required to process the 1,114,000 gallon per year of material. The annual hours of operation are directly related to the annual requested throughput.<br><br>Impacts for TAPs and criteria air pollutants with short-term averaging periods (3-hour and/or 24-hour) were based on operation at the facility's listed capacity of 3.5 gallons per minute.<br><br>The modeling demonstration used the emission rates listed in Tables 5 and 6. The annual emission rate for $NO_2$ and $SO_2$ accounted was an average emission rate that accounted for the 1,114,000 gallon per year throughput.<br><br>Modeling staff did not analyze TAP emission rate calculations in great enough detail to verify whether the modeled emission rate of every TAP that is emitted as particulate matter was assumed by INL to be controlled or uncontrolled by process and/or HEPA filtration systems. Emissions inventory validation and determination of filtration equipment status as process equipment versus air pollution control equipment is primarily the responsibility and authority of the permit writer. The modeled TAP emission rates that are listed in Table 6 reflect the annual operating hours limitation that is based on the annual process material throughput limitation. This memorandum makes no recommendation on permit conditions for pollution control equipment. |
| $PM_{10}$ emissions were controlled by both process and HEPA filtration systems to a quantity of 3.92E-08 tons per year (T/yr). Disregarding the HEPA filtration system control efficiency, provides an emission rate of 0.436 T/yr. The hourly $PM_{10}$ emission rate at 0.436 T/yr and 5,305 hours per year of operation is 0.16 lb/hr. All solids were assumed to be emitted as $PM_{10}$.<br><br>Lead emissions were estimated to be 7.24E-05 tons/yr.<br><br>CO emission were estimated to be 0.23 lb/hr. | $PM_{10}$, CO, and lead emission estimates were below the modeling thresholds and did not require modeling analyses to demonstrate compliance with significant contribution levels or NAAQS. |
| Ambient impacts presented by INL for sulfur dioxide ($SO_2$) and nitrogen dioxide ($NO_2$) were below significant contribution levels for all relevant averaging periods. | Ambient impacts of criteria air pollutants were below levels that trigger facility-wide modeling to demonstrate compliance with the National Ambient Air Quality Standards (NAAQS). |
| INL modeled the IWTU stack at two locations to account for options in the actual construction requirements for the stack.<br><br>The UTM coordinates of these locations are:<br><br>1) X: 344,169.5 meters<br>Y: 4,825,876.6 meters<br>Base Elevation: 1497.41 meters<br><br>2) X: 344,186.0 meters<br>Y: 4,825,869.0 meters<br>Base Elevation: 1496.56 meters | Either proposed stack location used in the modeling is demonstrates compliance with ambient standards and increments. |

## 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 INL facility is located in Butte and Jefferson Counties, 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 ($PM_{10}$).

#### 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 IDAPA 58.01.01.006.102 then a full impact analysis is necessary to demonstrate compliance with IDAPA 58.01.01.203.02. A full impact analysis for attainment area pollutants involves adding ambient impacts from facility-wide emissions 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] | 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) | Rolling 3-month | NA | 0.15[k] | Maximum 1st highest[g] |
| | Quarterly | NA | 1.5[h] | Maximum 1st highest[g] |

[a]IDAPA 58.01.01.006.102
[b]Micrograms per cubic meter
[c]IDAPA 58.01.01.577 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 excceded 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]Never to be exceeded

#### 2.1.3 TAPs Analyses

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

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

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

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

Per Section 210 of the Idaho Air Rules, if the emissions increase associated with a new source or modification exceeds screening emission levels (ELs) of the Idaho Air Rules Section 585 or 586, then the ambient impact of the emissions increase must be estimated. If ambient impacts are less than applicable Acceptable Ambient Concentrations (AACs) for non-carcinogens of Idaho Air Rules Section 585 and Acceptable Ambient Concentrations for Carcinogens (AACCs) of Idaho Air Rules Section 586, then compliance with TAP requirements has been demonstrated. If DEQ determines T-RACT is used to control emissions of carcinogenic TAPs, then modeled concentrations of 10 times the AACC are considered acceptable, as per Idaho Air Rules Section 210.12. Table 3 lists the applicable screening emission rates and regulatory limits (allowable increments) for the TAP modeled for this project.

## 2.2 Background Concentrations

Ambient background concentrations were revised for all areas of Idaho by DEQ in March 2003[1]. Background concentrations in areas where no monitoring data are available were based on monitoring data from areas with similar population density, meteorology, and emissions sources. Background concentrations used in these analyses are listed in Table 3. Monitored ambient concentrations from the INL Van Buren monitoring site were used for the background concentration of nitrogen dioxide ($NO_2$) and sulfur dioxide ($SO_2$). These values are the default remote rural background concentrations.

**Table 3. BACKGROUND CONCENTRATIONS**

| Pollutant | Averaging Period | Background Concentration ($\mu g/m^3$)[a] |
|---|---|---|
| $NO_2$[b] | Annual | 4.3 |
| $SO_2$[c] | 3-hour | 34 |
| | 24-hour | 26 |
| | Annual | 8 |

[a] Micrograms per cubic meter
[b] Nitrogen dioxide
[c] Sulfur dioxide

# 3.0 Modeling Impact Assessment

## 3.1 Modeling Methodology

Table 4 provides a summary of the modeling parameters used in the submitted INL modeling analyses.

1 Hardy, Rick and Schilling, Kevin. *Background Concentrations for Use in New Source Review Dispersion Modeling*. Memorandum to Mary Anderson, March 14, 2003.

| Table 4. MODELING PARAMETERS | | |
|---|---|---|
| *Parameter* | **Description/Values** | **Documentation/Additional Description** |
| Model | AERMOD | AERMOD, Version 07026 |
| Meteorological data | 2001-2005 Aberdeen/Boise met data | INL used a met dataset provided by DEQ. The dataset covers 2001 through 2005 and uses surface met data from Aberdeen, Idaho, and Boise airport upper air data for the same period. |
| Land Use (urban or rural) | Rural | Urban island heat effect dispersion coefficients were not used by INL. This is appropriate considering the land usage surrounding the facility. |
| Terrain | Considered | Receptor 3-dimensional coordinates were obtained by INL from the webgis.com website. This data was Shuttle Radar Topography Mission (SRTM1) format and had a resolution of 30 meters and used to establish elevation of ground level receptors. DEQ did not re-import the topographic files. |
| Building downwash | Downwash algorithm | Building dimensions obtained from modeling files submitted, and BPIP-PRIME and AERMOD were used to evaluate downwash effects. |
| Receptor grid | Grid 1 – UCART1 | 1 kilometer (km) spacing over a 32 km (X) hy 33 km (Y) area centered on the INL site with a 1,000 meter spacing |
| | Grid 2 – UCART3 | 100-meter spacing of a 5.5 km (X) by 2.5 km (Y) area that covers the north side of elevated terrain of Big Southern Butte |
| | Grid 3 – UCART4 | 50-meter spacing in a 2 km (X) by 1 km (Y) grid along the southern border of the INL site for area of maximum off-site impacts |
| | Grid 4 – Discrete Cartesian | 20,000-meter long East-West oriented line of discrete receptors made up of 100-meter spacing along the southern border of the INL for area of highest impacts and 1000-meter spacing at both ends of the line of receptors. |
| | Grid 5 – UCART 1 Expanded Grid Coverage | 1000-meter spacing covering an area covering 64 km (X) by 59 km (Y) in a grid that generally contains the INL in the southwest portion of the grid. |

### *3.1.1 Modeling protocol*

A protocol was submitted by CWI Environmental Programs, on behalf of the U.S. Department of Energy, Assistant Secretary for Environmental Management, Idaho National Laboratory, to DEQ prior to submission of the application. The protocol was received on via email on January 26, 2009. A minor revision to the protocol was received via email on January 27, 2009.

Written approval of the modeling protocol, with comments on modeling methodology, was issued by Darrin Mehr, Air Quality Division, DEQ, by e-mail, on February 5, 2009. Modeling was conducted using methods and data presented in the modeling protocol and the *State of Idaho Air Quality Modeling Guideline*.

### *3.1.2 Model Selection*

AERMOD was used by INL to conduct the final ambient air impact analyses for this project. DEQ verified that AERMOD, Version 07026, which is the current version of this regulatory guideline model, is the appropriate model for this project.

### *3.1.3 Meteorological Data*

INL initially intended to use surface data obtained from on-site met towers for the modeling demonstration. Processing of this data with AERMET was not completed in time for this application. DEQ recommended using a 2000-2004 dataset with Aberdeen surface data and Boise upper air data. DEQ provided the AERMOD-ready Aberdeen/Boise dataset to INL.

### 3.1.4 Terrain Effects

The modeling analyses submitted by INL considered elevated terrain. The actual elevation of each receptor was determined using AERMAP. Topographic data was obtained by INL from the "webgis.com" website, where Shuttle Radar Topography Mission (SRTM) data for the modeling domain. This resource has a 30 meter resolution.

### 3.1.5 Facility Layout

DEQ verified proper identification of the facility boundary and layout by comparing the plot plan submitted with the application to the layout in the electronic modeling files. Only the IWTU building was included in the modeling demonstration's BPIP files to account for downwash effects.

### 3.1.6 Building Downwash

Plume downwash effects caused by the IWTU building were accounted for in the modeling analyses. The Building Profile Input Program-PRIME (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 for AERMOD. AERMOD identified the effects of structure-induced downwash on predicted ambient impacts.

### 3.1.7 Ambient Air Boundary

Ambient air was determined to exist for all areas immediately exterior to the INL site for the annual averaging period. Members of the general public are not allowed to remain within the site's boundaries for any extended period of time. US Highway 20/26 runs through the southern section of the INL site (located to the south of the INTEC and IWTU location). US Highway 20/26 is accessible for transportation across the INL site by the general public. The highway itself is considered ambient air for criteria air pollutants and TAPs with short term averaging periods of 3 hours or 24 hours for this project. INL security personnel monitor the site and control access by the public. This is the same ambient air boundary that was used in the initial PTC modeling in 2006.

### 3.1.8 Receptor Network

INL altered the receptor network for this project. The initial PTC project for the IWTU used an ISCST3 modeling demonstration. INL's analysis indicated that the use of AERMOD instead of ISCST3 and the change in the meteorological data for this modeling demonstration caused the maximum impacts in ambient air to occur along the southern boundary of INL. Receptors were placed in the immediate area of Highway 20/26, but this modeling demonstration showed that worst-case ambient impacts were not predicted to be located along the highway. Therefore, a finely spaced line of receptors along the highway was not included in the current analysis.

INL used a coarse grid with 1 kilometer spacing to determine the location of maximum ambient impacts at receptors within ambient air. The results of the coarse grid analysis determined the areas where INL located denser receptor grids for the modeling demonstration. INL also used past DEQ-approved dispersion modeling analyses to determine the location of the receptor grids.

INL placed a line of discrete receptors along the southern boundary of the INL site. The discrete receptors were spaced at a distance of 100 meters in the region of higher ambient impacts and at a spacing of 1,000 meters at either end of the line of receptors where ambient impacts were predicted to be lower.
A refined receptor grid covering a 2 km (X) by 0.95 km (Y) area with a spacing of 50 meters was placed at the southern boundary of the INL site, extending south in ambient air.

A receptor grid with 100-meter spacing was placed on the elevated terrain of the northern face of Big Southern Butte.

On May 5, 2009, the INL also submitted the results of an additional modeling run using a very large grid which covered an area of 64 km (X) by 59 km (Y). Receptors were spaced at 1,000 meters. The run using this grid verified that no additional hot spots existed to the north and east of the INL site ambient air boundary.

The receptor grid met the minimum recommendations specified in the *State of Idaho Air Quality Modeling Guideline*.

## 3.2 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 INL's modeling:

- All modeled toxic air pollutant (TAP) and criteria air pollutant emissions rates were equal to INL's emissions calculated in the PTC application or the permitted allowable rate.

Table 5 lists the hourly criteria air pollutant emission rates for the 3-hour, 24-hour, and annual averaging periods. Hourly emissions were modeled for 3 hours for the 3-hour averaging period, and 24 hours for the 24-hour averaging period. Hourly emissions were modeled for 8,760 hours per year for the annual $SO_2$ and $NO_2$ NAAQS compliance demonstration. Both $SO_2$ and $NO_2$ annual ambient impacts were estimated using the operation limitation of 1,114,000 gallons of throughput per year, which was reflected in the hourly emission rates.

Table 6 lists the hourly toxic air pollutant emissions rates for the source included in the dispersion modeling analyses for the 24-hour and annual averaging periods. Hourly emissions were modeled for 24 hours per day for 24-hour averaging period, and hourly emissions were modeled for 5,305 hours per year for annual TAPs compliance. All emissions were assumed to be emitted from the IWTU stack.

The modeling was conducted using a 1 pound per hour (lb/hr) emission rate from the IWTU stack. This is a valid approach because only one source was modeled, and all ambient impacts are directly attributable to the single source. The unit emission rate design concentration at an ambient air receptor for each averaging period was multiplied by the requested emission rate to estimate the compliance ambient impact.

**Table 5. MODELED CRITERIA AIR POLLUTANT EMISSIONS RATES**

| Pollutant | Averaging Period | Emissions (lb/hr)[a] |
|---|---|---|
| Nitrogen dioxide ($NO_2$) | Annual | 7.50 |
| Sulfur dioxide ($SO_2$) | 3-hour | 3.83 |
| | 24-hour | 3.83 |
| | Annual | 2.32 |

[a] Pounds per hour

| Table 6. MODELED TAPs EMISSIONS RATES | |
|---|---|
| **Pollutant** | **TAP Emissions (lb/hr)[a]** |
| **Non-Carcinogenic TAPs** | |
| Aluminum (soluble salts) | 32.4 |
| Calcium Oxide | 6.76 |
| Chlorine | 1.28 |
| Chromium III | 0.51 |
| Fluoride | 0.25 |
| Hydrochloric Acid | 1.31 |
| Mercury (vapor) | 2.65 |
| **Carcinogenic TAPs** | |
| Arsenic | 4.69E-04 |
| Beryllium | 1.50E-04 |
| Cadmium | 1.10E-04 |
| Nickel | 2.58E-01 |

[a] Pounds per hour

## 3. 3 Emission Release Parameters

Table 7 provides emissions release parameters, including stack height, stack diameter, exhaust temperature, and exhaust velocity for point sources. Values used in the analyses appeared reasonable and within expected ranges. Additional documentation and verification of these parameters was not required.

| Table 7. POINT SOURCE STACK PARAMETERS | | | | | |
|---|---|---|---|---|---|
| ***Release Point*** | **Source Type** | **Stack Height (m)[a]** | **Modeled Stack Diameter (m)** | **Stack Gas Flow Temperature (K)[b]** | **Stack Gas Flow Velocity (m/sec)[c]** |
| IWTU – IWTU Main Stack | Point | 36.6 | 1.5 | 298.4 | 16.9 |

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

The documentation in the modeling report stated that the stack exit temperature was 145.5 degrees Fahrenheit (336.2 Kelvin). Review of the input files indicates that an exit temperature of 77.5 degrees Fahrenheit (or 298.4 Kelvin) was actually used in the modeling. This reduced exit temperature will reduce thermal buoyancy and is conservative for predicting nearby ambient impacts. Increasing the exit temperature to 336 Kelvin is not expected to alter predicted ambient impacts by any significant amount, and the modeling was accepted as submitted.

## 3.4 Results for Significant Contribution Analyses

A significant contribution analysis was submitted for this application. INL modeled the increases in $SO_2$, for all NAAQS averaging periods, and annual $NO_2$ emissions that are associated with the IWTU source. Emissions of carbon monoxide, lead, and $PM_{10}$ were below modeling thresholds for this project.

Modeling of emissions from INTEC boilers due to increased boiler usage for supplying steam to the proposed IWTU was not necessary because the boilers are already permitted to operate at the increased steam production levels.

The results of INL's modeling analyses are shown in Table 8. These impacts represent the design concentrations used by INL to demonstrate compliance with NAAQS and TAPs increments. The predicted ambient impacts for

criteria air pollutants are listed in Table 9. The results show that a full ambient impact analysis was not required for emissions of any criteria air pollutant.

On May 5, 2009, DEQ received a submittal of additional information from the INL. This information consisted of modeling runs for the 3-hour, 24-hour, and annual averaging periods using an expanded receptor grid that extended beyond the eastern and western INL facility boundaries. This information verified that the unit emission rate design concentrations used in the modeling analyses are the maximum predicted ambient impacts for this project to DEQ's satisfaction. DEQ did not re-run the modeling.

**Table 8. MODELED DESIGN CONCENTRATIONS**

| Averaging Period | Modeled Design Concentration ($\mu g/m^3$/gram/sec)[a] |
|---|---|
| 3-hour | 2.77429 |
| 24-hour | 0.36221 |
| Annual | 0.00494 |

[a]Micrograms per cubic meter per gram per second of emissions

**Table 9. RESULTS OF SIGNIFICANT CONTRIBUTION IMPACT ANALYSES**

| Pollutant | Averaging Period | Modeled Design Concentration ($\mu g/m^3$/lb/hr)[a] | Emission Rate (lb/hr)[b] | Predicted Ambient Impact ($\mu g/m^3$)[c] | Significant Contribution Level ($\mu g/m^3$) | Full Impact Analysis Required? |
|---|---|---|---|---|---|---|
| $SO_2$[d] | 3-hour | 2.77429 | 3.83 | 10.63 | 25.0 | No |
| | 24-hour | 0.36221 | 3.83 | 1.39 | 5.0 | No |
| | Annual | 0.00494 | 2.32 | 0.011 | 1.0 | No |
| $NO_2$[e] | Annual | 0.00494 | 7.50 | 0.038 | 1.0 | No |

[a] Micrograms per cubic meter per pound per hour of emissions
[b] Pounds per hour
[c] Micrograms per cubic meter
[d] Sulfur dioxide
[e] Nitrogen dioxide

## 3.5 Results for TAPs Analyses

Compliance with TAP increments were demonstrated by modeling uncontrolled TAP emissions where any uncontrolled TAP emission rate exceeded the screening emission rate limit (EL). Daily hours of operation were assumed to be 24 hours per day. Annual operating hours were assumed to be 5,305 hours per year. Table 10 summarizes the ambient TAP analyses.

The ambient impacts used to demonstrate compliance with the non-carcinogenic allowable ambient concentration were determined by multiplying the hourly emission rate of each TAP for the worst-case 24-hour period by the unit emission rate design concentration for the 24-hour averaging period—which was 0.36221 $\mu g/m^3$. The compliance demonstration design impacts for carcinogenic TAPs were determined by multiplying the unit emission rate design concentration for the annual averaging period—a value of 0.00494 $\mu g/m^3$—by the maximum hourly emission rate and an hours of operation factor of 5,305 hours per year divided by 8,760 hours per year.

| Table 10. RESULTS OF TAP ANALYSES | | | | |
|---|---|---|---|---|
| **TAP** | **Averaging Period** | **Maximum Modeled Concentration ($\mu g/m^3$)[a]** | **AAC/AACC[b] ($\mu g/m^3$)** | **Percent of AAC/AACC** |
| **Non-Carcinogenic TAPs** | | | | |
| Aluminum (soluble salts) | 24-hour | 11.7 | 100 | 12% |
| Calcium Oxide | 24-hour | 2.45 | 100 | 2% |
| Chlorine | 24-hour | 0.46 | 150 | 0.3% |
| Chromium III | 24-hour | 0.19 | 25 | 0.8% |
| Fluoride | 24-hour | 0.089 | 125 | 0.07% |
| Hydrochloric Acid | 24-hour | 0.47 | 375 | 0.1% |
| Mercury (vapor) | 24-hour | 0.96 | 2.5 | 38% |
| **Carcinogenic TAPs** | | | | |
| Arsenic | Annual | 1.39E-06 | 2.3E-04 | 0.6% |
| Beryllium | Annual | 4.45E-07 | 4.2E-03 | 0.01% |
| Cadmium | Annual | 3.26E-07 | 5.6E-03 | 0.006% |
| Nickel | Annual | 7.66E-04 | 4.2E-03 | 18% |

[a] Micrograms per cubic meter

[b] Acceptable ambient concentration /acceptable ambient concentration for carcinogens

## 4.0 Conclusions

The ambient air impact analysis submitted, in combination with DEQ's verification analyses, 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 C – Facility Comments

The applicant emailed the comments on the draft permit to DEQ on July 2, 2009. DEQ has addressed all the comments. The following are comments from the applicant:

"*Comments on Draft Permit:*

*Page 4, Table 1.1, column 3 – Comment 1. Replace "99.97% for PM/$PM_{10}$" with "99.97% per DOE- STD-3020-05"*

*Page 6, Section 2.6, Comment 2. - Delete "annual" It seems "annual" may be inconsistent with " consecutive 12 calendar month period"*

*Page 8, Section 2.4.2 Comment 3. - The new IWTU Project emission limit of 39.4 T/yr NOx in section 2.4 assures emissions are below the 40 T/yr PSD threshold. Please consider deleting the individual partial emission limits for the IWTU portion of the boilers and the IWTU Stack. Only the sum of the two emissions is used to compare to the PSD threshold. The total emissions from both the IWTU stack and the IWTU portion of the boiler emissions will be determined by the requirements of Section 2.13 and will be maintained below 39.4 T/yr. Please delete Sections 2.4.1 and 2.4.2.*

*Comments on Statement of Basis:*

*Page 5, Section 3.2, Table 3.2, Comment 1. NOx annual avg (7.50) – footnote 3 indicates 7.51.*

*Comment 2. CO max (0.23) – need new footnote for Calculation (e.g., lb/hr, max = 0.61 T/yr *2000 lb/T/[1,114,000/ (3.5 gal/min * 60 min/hr)]= 0.23 lb/hr, max) This value was not otherwise noted, thus inferring it was from Table 2, which it was not.*

*Page 6, Section 3.3, Table 3.3, Comment 3. Fluoride Maximum Modeled Concentration (0.0089) - should be "0.089" instead of "0.0089", and Percent of AAC/AACC will then be "0.07%" instead of "0.007%".*

*Comment 4. Beryllium Maximum Modeled Concentration (4.47E-07) - should be "4.45E-07" instead of "4.47E-07"*