

Statement of Basis

**Permit to Construct No. P-2013.0023
Project ID 61181**

**U.S. Department of Energy, Idaho Operations Office (DOE-ID)
Idaho National Laboratory (INL), Idaho Nuclear Technology and Engineering
Center (INTEC)
Sodium-Vapor Distillation System (SDS)
Scoville, Idaho**

Facility ID 023-00001

Final

August 30, 2013

**Harbi Elshafei 
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.

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ACRONYMS, UNITS, AND CHEMICAL NOMENCLATURE

AIRS	Aerometric Information Retrieval System
ANSI	American National Standards Institute
AQCR	Air Quality Control Region
ASTM	American Society for Testing and Materials
ASME	American Society of Mechanical Engineers
CAM	Compliance Assurance Monitoring
CFR	Code of Federal Regulations
CO	carbon monoxide
DEQ	Department of Environmental Quality
DOE-ID	U.S. Department of Energy, Idaho Operations Office
EL	screening emission levels
EPA	U.S. Environmental Protection Agency
FDP	Fluorinel Dissolution Process
HAP	hazardous air pollutants
hr/yr	hours per year
IDAPA	a numbering designation for all administrative rules in Idaho promulgated in accordance with the Idaho Administrative Procedures Act
INTEC	Idaho Nuclear Technology and Engineering Center
lb/hr	pounds per hour
MACT	Maximum Achievable Control Technology
mrem/yr	millirem per year
NAAQS	National Ambient Air Quality Standard
NESHAP	National Emission Standards for Hazardous Air Pollutants
NO ₂	nitrogen dioxide
NSPS	New Source Performance Standards
O&M	operation and maintenance
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
RH-TRU	Remote-handled transuranic
Rules	Rules for the Control of Air Pollution in Idaho
SDS	Sodium Distillation System
SO ₂	sulfur dioxide

T/yr tons per consecutive 12-calendar month period
TAP toxic air pollutants
TRU transuranic
VOC volatile organic compounds

FACILITY INFORMATION

Description

The sodium distillation system (SDS) consists of the following components: distillation vessel with a knife gate valve and electric furnace, condenser heated and cooled by a thermal fluid system, collection vessel, transfer vessel, sintered metal filter, and vacuum pump.

The sodium distillation system is installed in Building CPP-666, the Fluorinel Dissolution Process (FDP) and Fuel Storage Facility, containing the FDP cell at the Idaho Nuclear Technology and Engineering Center (INTEC). Remote-handled transuranic (RH-TRU) wastes are sorted, sized, and repackaged for disposal in this building. The objective of the permit is to remove sodium, using the distillation process, from the RH-TRU wastes. The sodium-vapor-distillation system is located at the minus 31-ft level of CPP-666. A tube, delayed neutron interrogator tube, extending from the FDP cell down to the sodium distillation vessel will be used as a pass-through to lower remote-handled radioactive waste, which is contaminated with elemental sodium, down into the SDS for sodium removal. Once the waste has been secured in the sodium distillation vessel, the device used to lower the waste into the vessel from the FDP cell will be detached and removed from the vessel. Then, the top of the vessel will be sealed remotely using the servo motor driven knife gate valve on the top of the vessel, and the sodium will be distilled from the vessel and collected in a collection vessel. After completion of the distillation cycle, the waste in the distillation vessel will be retrieved up through the delayed neutron interrogator tube to the FDP cell, where it can be repackaged for final disposition.

Permitting History

This is the initial PTC for the SDS at INTEC thus there is no permitting history.

Application Scope

This permit is the initial PTC for the SDS at INTEC. This permit application seeks approval for the construction of a new process called Sodium Distillation System. Emissions from the process are controlled by two banks of HEPA filters before it released to the atmosphere. A radiological stack monitoring system is included to monitor emissions from the facility.

Application Chronology

April 4, 2013	DEQ received an application and an application fee.
April 9, 2013	DOE and CH2M-WG Idaho held an informational public meeting for the proposed project
April 18, 2013	DEQ approved pre-permit construction.
May 3, 2013	DEQ determined that the application was complete.
May 14 – May 29, 2013	DEQ provided an opportunity to request a public comment period on the application and proposed permitting action. During this time, a request for a full 30-day comment period was received
May 15, 2013	DEQ received supplemental information from the applicant.
June 20, 2013	DEQ made available the draft permit and statement of basis for peer and regional office review.
June 27, 2013	DEQ made available the draft permit and statement of basis for applicant review.
July 16 – August 15, 2013	DEQ provided a public comment period on the proposed action.
July 26, 2013	DEQ received the permit processing fee.

TECHNICAL ANALYSIS

Emissions Units and Control Equipment

Table 1 Emission Unit and Control Equipment Information

Source ID No.	Sources	Control Equipment	Emission Point ID No.
SDS at INTEC, Room CPP-666	Distillation of Sodium Contained in Remote-handled Transuranic (RH-TRU) Waste Lots 6 and 7at INTEC	<u>Control Device Name:</u> Two Banks of High-Efficiency Particulate Air (HEPA) Filters PM ₁₀ Control efficiency: 99.97%, each	FAST Stack, CPP-767-001

Emissions Inventories

Potential to Emit

An inventory of estimated radionuclides, criteria air pollutants, toxic air pollutants, and greenhouse gas emissions are developed by the permittee in the PTC application received on April 4, 2013. The estimated emissions are summarized below.

Radionuclide Emissions:

The radionuclides emissions from this process are subject to 40 CFR 61 Subpart H, National Emission Standards for Emissions of Radionuclides Other Than Radon From Department of Energy Facilities. In accordance with 40 CFR 61.92, "emissions of radionuclides to the ambient air from Department of Energy facilities shall not exceed those amount that would cause any member of the public to receive in any year an effective dose equivalent of 10 mrem/yr."

The radionuclide inventory, release, and doses from the SDS project are shown in Appendix A, Table A-2 of the PTC application. The radionuclides monitoring requirements are discussed in Section 5.2.1.2 of the PTC application and also in the NESHAP applicability section of this statement of basis (SoB).

Also, the SDS project is not exempt under the state Category I Exemption in accordance with IDAPA 58.01.01.221.02, because the source's radionuclides potential to emit (PTE) is higher than 1% of the applicable radionuclides standard in 40 CFR Part 61, Subpart H, which is 10 mrem/yr. Therefore, a state PTC is required for the project.

Criteria Air Pollutant Emissions:

According to Section 4.2 of the PTC application, the only criteria air pollutant that may be emitted from this process is a small amount of volatile organic compounds (VOCs). The permittee estimated and DEQ reviewed the PTE of VOCs emissions from this process which are as follow: 0.006 lbs/hr and 0.03 tons/yr. There is no other criteria air pollutant expected to be emitted from the SDS process.

Toxic Air Pollutants (TAP) Emissions:

The potential non-carcinogenic TAP emissions from the process are summarized in Table 2 below. There are no carcinogenic TAPs listed in IDAPA 58.01.01.586 emitted from the process. As shown in Table 2 all estimated emissions increases of TAP which are reviewed by DEQ and found to be below the applicable screening emission levels (EL) identified in IDAPA 58.01.01.585; therefore, no additional analysis is necessary under Section 210 of the Rules.

Table 2 Potential TAP Emission Rates from SDS

Chemical Name	Average Emissions Rate (lb/hr)	Screening Emissions Level, IDAPA 585 (lb/hr)	Exceeds Screening Levels? (Y/N)
Ethyl benzene	0.00075	29	No
2-methoxyethanol	0.0011	1.04	No
Xylene	0.0026	29	No
Acetic acid	0.0019	1.67	No

Greenhouse Gas (GHG) Emissions:

No GHG is expected to be emitted from this process.

Ambient Air Quality Impact Analyses

As presented in the emissions inventories above, the estimated emission rate increases of all pollutants resulting from this project were below applicable screening emission levels (EL) and published DEQ modeling thresholds established in IDAPA 58.01.01.585 and in the State of Idaho Air Quality Modeling Guidance¹. Therefore, modeling was not required for this project.

¹ Criteria pollutant thresholds in Table 1, State of Idaho Air Quality Modeling Guideline, Doc ID AQ-011, rev. 2, July, 2011.

REGULATORY ANALYSIS

Attainment Designation (40 CFR 81.313)

The INTEC facility is located in Butte County, which is designated as attainment or unclassifiable for PM_{2.5}, PM₁₀, SO₂, NO₂, CO, and Ozone. Refer to 40 CFR 81.313 for additional information.

Permit to Construct (IDAPA 58.01.01.201)

IDAPA 58.01.01.201Permit to Construct Required

The proposed source has an estimated radionuclide dose that would exceed the PTC exemption criteria set forth in IDAPA 58.01.01.221.02. Therefore, the permittee has requested that a PTC be issued. This permitting action was processed in accordance with the procedures of IDAPA 58.01.01.200-228.

IDAPA 58.01.01.224-228Permit to Construct Fees

The PTC application fee of \$1,000.00 applies per Section 224. In addition, the PTC processing fee of \$1,000.00 applies per Section 225 since this project will result in an emissions increase of less than one ton per year. Refer to the chronology for the fee receipt dates.

IDAPA 58.01.01.210Demonstration of Preconstruction Compliance with Toxic Standards

The potential uncontrolled emissions of TAPs from the proposed SDS project are all less than the corresponding screening emission level (EL) listed in Section 585 of the Rules. Refer to the TAP emissions in the emission inventory section above. No additional information is necessary to demonstrate compliance with the TAP standards per Section 210.05.

IDAPA 58.01.01.213Pre-Permit Construction

The permittee applied for and complied with the requirements for obtaining pre-permit construction approval for the SDS project. This included compliance with the requirements for providing notice and holding an informational meeting to inform the public of the proposed project. This meeting was held at the Idaho Falls Public Library on April 9, 2013. The application materials were reviewed and found to be complete and include information to describe how compliance will be achieved with applicable requirements for the proposed project. On this basis, pre-permit construction approval was issued by DEQ on April 18, 2013. With this approval the applicant may commence construction, at risk as described in Section 213.02 of the Rules; however, commencement of operations as described under the proposed project shall not occur until after the PTC is issued.

Tier II Operating Permit (IDAPA 58.01.01.401)

IDAPA 58.01.01.401 Tier II Operating Permit

The procedures of IDAPA 58.01.01.400-410 for a Tier II operating permit do not apply.

Visible Emissions (IDAPA 58.01.01.625)

IDAPA 58.01.01.625 Visible Emissions

The sources of PM₁₀ emissions at this facility are subject to the State of Idaho visible emissions standard of 20% opacity. This requirement is assured by conditions in the Tier I operating permit that set forth requirements for periodic visual inspections at the facility.

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

IDAPA 58.01.01.301 Requirement to Obtain Tier I Operating Permit

The INL is classified as a major facility under the Title V program and a Tier I operating permit has been issued for this purpose. It is not necessary to amend the Tier I permit as a result of issuance of this PTC since it already contains site-wide requirements to meet the NESHAP regulations under 40 CFR 61 Subpart H.

PSD Classification (40 CFR 52.21)

40 CFR 52.21Prevention of Significant Deterioration of Air Quality

The INL is classified as an existing major stationary source under the PSD program. It is noted that there is not a reasonable possibility that this project would be a major modification, since the increase in emissions is far below the significant thresholds. Also, no limitations were applied to this project to prevent it from being a major modification. The PSD requirements, including the recordkeeping requirements under 52.21(r)(6) do not apply to this project.

NSPS Applicability (40 CFR 60)

The SDS project is not subject to any NSPS requirements 40 CFR Part 60.

NESHAP Applicability (40 CFR 61)

The SDS project is subject to NESHAP regulations according to 40 CFR 61 Subpart H, National Emission Standards for Emissions of Radionuclides other than Radon from Department of Energy Facilities. Under 40 CFR 61.93, this project will trigger stack monitoring requirements for the SDS. As specified in 40 CFR 61.93(e), radionuclide emissions were evaluated by DOE to determine whether the stack release point (CPP-767 FAST Stack) is subject to the new source emission measurement requirements under 40 CFR 61.93(c). In evaluating the potential of a release point to discharge radionuclides for the purposes of determining monitoring requirements, the permittee estimated the uncontrolled potential radionuclide release rates. The resulting effective dose equivalent (EDE) was calculated based on the discharge of the effluent stream that would result if all pollution control devices did not exist, but the facility's operations were otherwise normal (40 CFR 61.93(f)). The results are shown in Table A-2 of the PTC application. From Table A-2 of the application the calculated uncontrolled potential EDE is equal to 6.1 mrem/yr. Because the uncontrolled potential radionuclide dose is greater than 1% of the 10-mrem/yr threshold, the radioactive monitoring requirements shall apply in accordance with 40 CFR 61.93(c).

The FDP cell air is exhausted through two banks of HEPA filters and out the CPP-767 FAST Stack. The FAST Stack effluent is measured using the methods specified in ANSI/HPS N13.1-1999 and Sections (c)(1) and (c)(2) of 40 CFR 61.93. The sampling location in the CPP-666 heating, ventilation, and air conditioning exhaust tunnel was qualified by in-place testing (PNNL 2010). In accordance with 40 CFR 61.93(e), radionuclides that could contribute greater than 10% of the EDE shall be measured. For the SDS project, Sr-90, Cs-137, and Pu-239/240, each exceeds the 10% of the potential EDE (see Appendix A in the PTC application) and therefore, will be measured. Per Section 2.3.2 of the PTC application, these radionuclides are presently measured by the existing monitoring system.

It is noted that EPA has retained authority to administer Subpart H and has not delegated this authority to DEQ, therefore, any approvals or interpretations of this regulation will be managed by EPA. This SDS project triggers the requirement to apply for an "approval to construct" from the EPA in accordance with 40 CFR 61.96. This application was sent to EPA Region 10 and approved on June 25, 2013. Refer to the copy attached in Appendix A for details. The Tier I permit already contains site-wide requirements to meet the NESHAP regulations under 40 CFR 61 Subpart H. Similar permit conditions are included in this permit also. The existing Tier I permit conditions for Subpart H are sufficient to address this project for the SDS, and they do not require modification as a result of issuance of this permit.

MACT Applicability (40 CFR 63)

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

CAM Applicability (40 CFR 64)

The Compliance assurance Monitoring (CAM) requirements under 40 CFR Part 64 do not apply to the HEPA filter system because the potential pre-control device emissions of PM/PM₁₀ are less than 100 tons per year in accordance with 40 CFR 64.2(a)(3).

Permit Conditions Review

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

Initial Permit Conditions 1-4

These are standard permit conditions that provide a description of the project.

Initial Permit Conditions 5, 6, 8 and 10

These permit conditions set forth the NESHAP regulations under 40 CFR 61 Subpart H as they apply to the SDS. The NESHAP regulations include the following; emission standard/limit under 40 CFR 61.92 that applies to all sources at the INL, including the SDS; detailed operating monitoring and recordkeeping requirements under 40 CFR 61.93, including requirements for the SDS to install and operate an emission monitoring system to monitor radionuclide emissions; and recordkeeping and reporting to document radionuclide emissions and effective dose equivalent values in accordance with 40 CFR 61.94 and 61.95.

Initial Permit Conditions 7 and 9

For consistency across the INL site, HEPA filter system permit conditions have been standardized in the most recently issued permits. The standard HEPA filter system permit conditions are included in this permit. A HEPA filter system is integral to this facility to capture radionuclides and prevent their release out of the stack. This system also controls emissions of any other PM and particulate TAPs. Since credit is taken for reduction of TAP emissions by the HEPA filter system, requirements for installation and operation of this system are included in the permit as "state-only requirements". The PTC conditions are included to assure that the filter system continues to operate in the manner described in the permit application, and for which compliance with applicable requirements was demonstrated in the permit application. Those specific requirements include the following: minimum filter efficiency; standards for installation and testing; procedures for operation and maintenance; and requirements for monitoring and recordkeeping of pressure drop measurements.

Initial Permit Condition 11

The standard permit condition that addresses the applicability of CFR requirements was added to this permit. This is consistent with the permit condition that is used in the facility-wide section of the INL Tier I renewal permit. It is important to note that whenever there is a conflict in the meaning between a PTC permit condition and a CFR requirement, the CFR will take precedence.

Initial Permit Conditions 12 through 27; PTC General Provisions

Standardized "General Provisions" that are included in all Permits to Construct are also included in this permit. Those provisions are described individually below:

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

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

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

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

The construction and operation notification provision requires that the permittee notify DEQ of the dates of construction and operation, in accordance with IDAPA 58.01.01.211.

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

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

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

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

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

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

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

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

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

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

PUBLIC REVIEW

Public Comment Opportunity

An opportunity for public comment period on the application was provided in accordance with IDAPA 58.01.01.209.01.c from May 14 to May 29, 2013. During this time a request for a full comment period was received, therefore a 30-day public comment period on the draft PTC was provided in accordance with IDAPA 58.01.01.209.01.c. Refer to the chronology for public comment opportunity dates.

Public Comment Period

A public comment period was made available to the public in accordance with IDAPA 58.01.01.209.01.c. During this time, comments were submitted in response to DEQ's proposed action. Refer to the chronology for public comment period dates.

A response to public comments document has been crafted by DEQ based on comments submitted during the public comment period. That document is part of the final permit package for this permitting action.

APPENDIX A – EPA REGION 10 APPROVAL, 40 CFR 61 SUBPART H NESHAP



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue, Suite 900
Seattle, WA 98101-3140

JUN 25 2013

OFFICE OF
AIR, WASTE AND TOXICS

Mr. Tim J. Safford
Environmental Technical Support Division
Department of Energy
Idaho Operations Office
1955 Fremont Avenue
Idaho Falls, Idaho 83415

Re: Idaho National Laboratory Application to Construct – Distillation of Sodium from Wastes
at the Idaho Nuclear Technology and Engineering Center

Dear Mr. Safford:

This letter is in response to the *Application to Construct for the Distillation of Sodium from Wastes at the Idaho Nuclear Technology and Engineering Center* from the Department of Energy (DOE) on April 1, 2013. In the application, the DOE requests that the U.S. Environmental Protection Agency (EPA) review and approve the construction of the unit for Distillation of Sodium from Wastes (“Sodium Distillation System”) at the Idaho National Laboratory (INL), Idaho Nuclear Technology and Engineering Center (INTEC). The Sodium Distillation System is a new emissions source subject to the requirements of the National Emission Standards for Emissions of Radionuclides other than Radon from Department of Energy Facilities (40 C.F.R. Part 61, Subpart H). Approval from the EPA is required pursuant to 40 C.F.R. § 61.08 prior to the construction of a new emissions source subject to 40 C.F.R. Part 61, Subpart H. This new emission source is a subset of the INL’s ongoing Remote-Handled Transuranic (RH-TRU) Waste Repackaging Project. Upon completion of construction of the Sodium Distillation System, sodium removed from the RH-TRU wastes will be stored on-site until it can be sent off-site for treatment and disposal, and remaining waste will be repackaged for final disposal. Based on the information provided in your letter as summarized below, the EPA approves your request to construct the Sodium Distillation System.

BACKGROUND

The Sodium Distillation System is proposed to be constructed in Building CPP-666 at the INTEC. As part of the RH-TRU Waste Repackaging Project, the Sodium Distillation System will remove sodium contained in RH-TRU Waste Lots 6 and 7 by distillation. The RH-TRU Waste Lots 6 and 7 contain wastes that primarily consist of uranium, plutonium, transuranic isotopes, and short-lived isotopes (e.g. cesium and cobalt). The Waste Lots also contain the hazardous constituents of sodium and sodium-potassium alloy, which are categorized as reactive and ignitable. The highly reactive nature of sodium in waste makes the waste difficult to handle and treat, thus requiring the removal of sodium prior to packaging for final disposal.

The Sodium Distillation System will be installed and remotely controlled in a room 31-feet below ground level in Building CPP-666. Waste contaminated with elemental sodium will be lowered into the Sodium Distillation System for sodium removal. Upon completion of the distillation cycle, the waste in the distillation vessel will be retrieved for repackaging and final disposal in Building CPP-666. Gas stream in the Sodium Distillation System and Building CPP-666 will be exhausted through two banks of high-efficiency particulate air filters and out the Flourinel Dissolution Process and Fuel Storage (FAST) Stack for Building CPP-767. The FAST Stack is equipped with an Annubar flow meter measuring stack flow and a continuously operating sampler that extracts a sample at a flow proportion to stack flow. Samples are collected using a shrouded probe and delivered to a particulate filter for analysis.

The following assumptions were relied upon by the DOE to determine whether continuous monitoring is required per 40 C.F.R. § 61.93:

1. For Potential-To-Emit (PTE) calculations, all material will be heated above 100 °C, thus considered gaseous and released to the atmosphere in its entirety;
2. For calculation of abated effective dose equivalent (EDE), all gaseous radionuclides are assumed released; and
3. For calculation of abated EDE, one percent of the inventory is assumed released through two HEPA filters at 99.97% efficiency.

The calculated PTE for this project is 610 millirem (mrem) per year, and the abated EDE from anticipated Sodium Distillation System activities will be $8.7E-07$ mrem per year.

DETERMINATION

The EPA has reviewed the information in your application and your methodology for estimating radionuclide emissions. The following determinations were made based on the information provided by the DOE regarding the Sodium Distillation System construction:

According to 40 C.F.R. § 61.07(a), the owner or operator shall submit to the EPA Administrator an application for approval of the construction of any qualifying new source or modification of any existing source. Based on the $8.7E-07$ mrem per year estimated emissions from Sodium Distillation System operations, the dose to the Maximally Exposed Individual will not exceed the 10 mrem per year limit set forth in 40 C.F.R. § 61.92. The EPA, therefore, approves the construction of the Sodium Distillation System of at Building CPP-666 the Idaho National Laboratory, Idaho Nuclear Technology and Engineering Center.

Please note that, because the PTE is potentially in excess of 1% of the 10 mrem standard specified in 40 CFR 61.92, radionuclide emission measurements in conformance with requirements of 40 C.F.R. § 61.93(c) shall be made. Additionally, radionuclides that could contribute greater than 10% of the potential EDE shall be measured.

Finally, this approval only allows the use of the methods described in the *Application to Construct for the Distillation of Sodium from Wastes at the Idaho Nuclear Technology and Engineering Center*. If DOE wishes to use alternative methods for PTE estimation, it will be required to submit an additional request for EPA review and approval. It is DOE's responsibility also to ensure that the DOE is compliant with all State and local requirements for calculating radionuclide air emissions doses.

If you have any questions regarding this approval, please contact Davis Zhen of my staff at 206-553-7660 or email at zhen.davis@epa.gov.

Sincerely,

A handwritten signature in blue ink, appearing to read 'Kate Kelly', is written over the word 'Sincerely,'.

Kate Kelly, Director
Office of Air, Waste and Toxics

APPENDIX B – PROCESSING FEE

PTC Fee Calculation

Instructions:

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

Company: INL INTEC
Address: INL INTEC
City:
State:
Zip Code:
Facility Contact: Tim Safford
Title:
AIRS No.: 023-00001

- 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	0	0.0
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	0	0.0
Fee Due	\$ 1,000.00		

Comments:

APPENDIX C – PUBLIC COMMENT PERIOD COMMENTS

The following comments were received from Mr. Roger Turner, Pocatello, Idaho, on August 15, 2013:

Comment #1: The draft permit application did not provide the information necessary to determine if this is a major or minor source. The applicant did not provide a chemical analysis of the raw material, nor did they indicate the total mass or volume of waste to be treated. While the applicant *did* provide an estimate of the radionuclide emissions, and a vague narrative statement of the raw material constituents, details are too limited for IDEQ to ensure this is a minor source modification. In appendix C of the application there is a checklist (form CSPTC) of required application submittals. The DOE applicant did not check the emission inventory section, nor provide the appropriate form to provide it. The applicant did not provide basic information to determine if the source is major or minor, the radiation source calculation does not indicate the inventory of contaminants (chemical analyses by percent of raw materials) destined to be treated at this facility.

DEQ Response: Section 4.3 of the application addressed PSD applicability of Sodium Distillation System (SDS) project at INL. The only criteria air pollutant that is expected to be emitted from the SDS is VOCs (precursors to ozone.) The emission rate of VOCs from this project is estimated at 0.03 T/yr, which is well below the 40 T/yr of significant emission rate, as defined in IDAPA 58.01.01.006.106.a.v.

Radionuclides are not a regulated air pollutant in accordance with 40 CFR 52.21(b)(50)(v) and therefore, they are not applicable to major or minor classification under the PSD program.

The applicant submitted the emission inventory for criteria air pollutants, TAPs, and HAPs for this project and are included in the application in Table 2, Table 3, and Table 4, respectively.

Radionuclides inventory, release, and doses were also included in the application for the SDS project. Please refer to Table A-2 of the application. This information was also reviewed by EPA Region 10 and a copy of the EPA Approval to Construct Letter is included in Appendix A of this statement of basis. In addition, please refer to the information provided by INL that is attached below.

Comment #2: The applicant failed to provide the most basic required sections of the application. There was no emission inventory (with weights or mass total) there was no flow rate raw material provided; there was no chemical analysis of the raw material. A vague narrative statement of the contents was all that was provided. Without the above information, it is pure speculation as to the emissions. And, not surprisingly, this is reflected within the draft permit where insufficient permit limits were established.

DEQ Response: The chemical analysis of the material released from this project is shown in Table A-2 "Radionuclide inventory, releases, and doses for the Sodium Distillation Project" of the PTC application. The PTC has a radionuclide emissions limit, which is included in Permit Condition 5. It states the following: "In accordance with 40 CFR 61.92, emissions of radionuclides to the ambient air from Department of Energy facilities shall not exceed those amounts that would cause any member of the public to receive, in any year, an effective dose equivalent of 10 millirems per year (mrem/yr). Table A-2 of the PTC application contains the emissions inventory for this project.

Comment #3: The draft permit fails to control this facility's emissions. The permit has failed to place any type of limit to the through-put of raw material to be processed at this facility. There is no limit to the hours of operation, no limit to the flow rate through the facility, and no limit to the pounds per hour, no requirement to chemically analyze the raw material before startup. It's an empty permit. This combined with the lack of emission inventory data, and lack of characterization of the waste, in the application, makes for a poorly drafted permit. The air quality scrubbers may also be inadequate.

DEQ Response: With regard to control of the facility's radionuclide emissions, please refer to Permit Condition 7 (SDS HEPA Filter Systems.) This permit condition requires that the permittee control radionuclide emissions from the SDS project by using a HEPA filter system. There is no scrubber associated with this process for control

of particulates. HEPA filters are far more effective particulate matter control devices than are scrubbers. The emissions limit set forth in Permit Condition 5 limits radionuclide from this process as required by 40 CFR 61, Subpart H. A HEPA filter system is the control device which is required to control the radionuclide emissions. Appropriate and sufficient operating, monitoring and recordkeeping requirements for the HEPA filter system are contained in Permit Conditions 6, 7, 8, and 9.

Permit Condition 10 requires that the INL report to EPA the radionuclide emissions from this process. DEQ's responses to the two previous comments address the emissions inventory, and material being processed.

Comment #4: Firstly, a HEPA filter system is integral to this facility to capture radionuclides and prevent their release out of the stack. This system may also control emissions of other particulate matter. The description of the HEPA filter system sounds adequate to capture particulate matter. However the HEPA filters can only operate at full efficiency when the pressure drop is continually monitored. The draft permit provides that the operator check the pressure drop only once per day. This is inadequate to ensure that the HEPA filters are operating at their optimum efficiency. A continuous pressure drop sensor should be installed with a warning system sent to the operator if there is an excursion from the manufacturer's recommended range. Such pressure drop equipment is routinely used at the INL.

Secondly, the applicant should have explored alternative controls in addition to the HEPA filters. If gaseous organic pollutants or gaseous radionuclide compounds are given off, as part of the process, characterized by a particle size below efficient capture by the filters, the best air quality control strategy is to incorporate another scrubber in addition to the HEPA filters. For example, a Granulated Activated Carbon (GAC) scrubber in the off-gas train may be considered. At the least, the applicant should have addressed gases and particle size and the alternatives to best capture pollutants from this source.

DEQ Response: The HEPA filter system required by Permit Condition 7 is the approved and recognized option to control radionuclide emissions. There is no better control technology to control particulate radionuclides than that of HEPA filters.

The radionuclide emissions from this project meet the emissions standard specified in 40 CFR 61.92 and EPA has not delegated authority to DEQ to implement 40 CFR 61, Subpart H. Therefore, DEQ has no authority to request from the permittee to install different control equipment than the proposed HEPA filters system that is used for the SDS.

Comment #5: I support the permit requirement to adhere to 40 CFR 61.93. However, there are various alternative stack monitoring and flow (velocity and volumetric) monitoring alternatives listed his section of the CFR. There is also an alternative to require, in addition to operating a Continuous Emission Monitor (CEM) for radionuclides, a performance stack test. The permit should be more specific as to which alternative(s) are to be used. If the applicant requested any waivers or special alternatives for monitoring, other than the standard one listed in 40 CFR 61.93 it should have been provided in the application and permit.

Flow velocity and flow volume are critical to the proper operation of the Air Quality controls and the permit should specify velocity and flow limits.

DEQ Response: A BACT review is required for a minor sources permit. Nonetheless, HEPA filters are considered the best available control technology to control both radionuclide and non-radionuclide particulate emissions.

The radionuclides in-stack monitoring is included in Permit Conditions 6 and 8 and is in accordance with 40 CFR 61.93. The radionuclide monitoring method that INL requested in the application submitted to EPA is specified in 40 CFR 61.93(c)(1) and (c)(2). The EPA Region 10 Approval to Construct Letter (see Appendix A of this Statement of Basis) has mandated INL to comply with the monitoring requirements of 40 CFR 61.93(c). The EPA approval occurs as a separate action from issuance of this PTC for the SDS project at INL.

The in-stack CEM monitoring to measure radionuclides emissions from the SDS stack is sufficient for meeting the PTC emissions limits specified in Permit Condition 5. A performance test is not required.

Comment #6: In order to sure that the Continuous Emission Monitor (CEM) for radionuclides in the stack is calibrated correctly, a performance stack test should be carried out semi-annually to compare with the continuous one. Such a performance stack test is listed as an alternative in 40 CFR 60.93. Sections 18.19. 20 of the permit should be amended to require a performance source test.

DEQ Response: Please see DEQ response immediately above this comment. Also, please refer to the information provided by INL that is attached below.

Comment #7: Summary

Given the history of INL and the number of past air quality and RCRA violations, the DOE and the IDEQ should go the extra step to solicit public comment, clearly define air emission source characteristics and include basic permit limits. Unfortunately the draft permit package does not provide the simple characteristics of this waste material and does not address safety concerns in treating it through this air permit: A violation of administrative Rules. (IDAPA 58.01.01)

One of the primary components of this waste-stream is Sodium Potassium (NaK). This material is highly explosive. A large explosion took place at the Oak Ridge Y-12 facility on December 8, 1999, when NaK was mishandled. The application should be returned for more information of the characteristics of the waste mixture and the amount to be processed.

The applicant failed to provide the form required to report the emission inventory, failed to report the total through-put, waste volume, waste mass, and chemical analyses of the waste stream. Without this, the IDEQ's hands are tied to provide adequate permit limits. One of the most basic requirements of air quality permits is to place a limit on the process volume or hours of operation. Surprisingly, the draft permit lacks nearly all such basic permit limits. Gaseous emissions are uncontrolled and not required to be monitored. Air quality control alternatives, beyond the HEPA filters are not explored or presented in the application.

When ones consider the explosive nature of the sodium constituents, combined with the large levels of curies in this waste stream, the permit application is inadequate to protect the public. This application process, if not totally denied by IDEQ, should be returned to DOE, re-done, with additional public comment period.

DEQ Response: This permit is written specifically for the SDS process. The permit provides adequate operating, monitoring and recordkeeping requirements to assure compliance with the emissions limit. In addition, please refer to the information provided by INL that is attached below.

The DOE/INL provided the following responses to the comments received on the Draft PTC:

Section of Public Comment	Applicant Response
<p>Minor or Major Modification status, not determined.</p>	<p>Sections 4.2 and 4.3 of the Permit Application states the only potential criteria pollutant emissions are 0.03 Ton/year of Ozone (as VOC) and that this source is not a major modification.</p> <p>A conservative best engineering estimate was made of potential Toxic Air Pollutant emissions as shown in appendix B of the Application. There it is stated only 1 drum per day (at 901 lb/drum) can be processed, by design, and non-carcinogenic TAP compliance is based on a 24 hour average. It was not required to estimate TAP emissions for any other period. No emission factors are available based on volume or mass of the waste proposed to be processed, they were not parameters used to determine emissions, and therefore were not included. As required by IDAPA Section 58.01.01.210.02, the TAP emissions were determined using equipment operating time with no restrictions and amount of material processed in that time. Potential to Emit for PSD was determined using the above methodology, conservatively assuming 8760 hours/year operation, proposed modification was not major, and was so stated in Section 4.3 of the application. Annual HAP Emissions were calculated similarly to verify they are below major source levels in Section 4.5 of the application.</p>
<p>The application is incomplete.</p>	<p>Raw material feed and compositions were as described above and Included as required in Appendix B of the application.</p>
<p>Permit weaknesses Identified</p>	<p>The waste has been adequately characterized and consists primarily of various metal reactor components. These components are contaminated with small amounts of elemental sodium. A few of the containers contain very small amounts of sodium-potassium alloy. Because these components were in a reactor environment the possibility of organic constituents is extremely small.</p>
<p>Permit weaknesses Identified</p>	<p>The emissions did not require scrubbers other than HEPA filters, which are designed and operated to meet the standards, (ANSI) N510 and DOE Standard 3020-2005.</p> <p>Pressure drop of filters for this source are monitored continuously and alarmed. Per procedure, filters are not operated above 5 in. W. C.</p> <p>No gaseous pollutants (radiological or non-radiological) were identified that were at a level requiring controls.</p>
<p>Monitoring and Recordkeeping Need more Detail</p>	<p>Qualification and QA/QC evaluations are required to be conducted on installation, and periodically thereafter per ANSI-13.1-1999 as stated in 40 CFR Part 61.93(c) and Subpart A of Part 61 (40 CFR Part 61.14). The monitoring system was upgraded to meet current requirements of 40 CFR Part 61.93(c) and ANSI N13.1-1999. There is no need to apply for an alternative such as Section (d) or (g) of 40 CFR Part 61.93.</p> <p>There were no alternatives requested as evidenced by lack of any requests in the</p>

	<p>PTC application which was also transmitted to the EPA Region 10 as the Approval to Construct Application. In addition, the EPA Approval to Construct states the monitoring system must comply with the 40 CFR Part 61.93(c) requirements.</p>
<p>Radionuclide Performance Stack Test Recommended</p>	<p>QA/QC evaluations are required to be conducted periodically per ANSI-13.1-1999, Section 7, as required by 40 CFR Part 61.93(c).</p>
<p>Summary</p>	<p>The overall safety envelope for the sodium distillation system (SDS) is encompassed by the ICP Safety Management Programs (SMPs). Safety is a prerequisite in every activity at the ICP. The proposed SDS is located in a nuclear facility, therefore the requirements of 10 CFR 830, Subpart B^[1] apply and must be satisfied. Hazard and accident analyses are essential, central elements of the safety analysis required by 10 CFR 830, Subpart B. Hazard analysis is a systematic and comprehensive process that identifies and qualitatively evaluates hazards that can affect the off-Site public, on-Site (co-located) workers, facility workers, or the environment. All components of the SMPs are engaged to develop the nuclear safety envelope which includes operation of the SDS. A hazard analysis for the SDS identified hazardous conditions and operability issues. In addition to the hazardous event, the cause of the event, potential consequences, and potential controls that prevent or mitigate the event are identified. As part of developing the overall safety basis for the SDS, operational experience and Lessons Learned were reviewed to ensure all expected and unexpected events were considered. Potential controls may include safety-significant structures, systems, and components (SSCs), Specific Administrative Controls, or Technical Safety Requirement (TSR) administrative controls. In conjunction with control development, the hazards analysis confirms the functional classification of controls required to prevent and/or mitigate potential hazardous conditions. Normally, this safety discussion would not be included in a PTC Application.</p> <p>Adequate description was included and potential to emit calculations were based on maximum throughputs stated in the application.</p> <p>Total mass throughput was used to ensure major thresholds were not exceeded for both PSD and HAPs.</p> <p>1. 10 CFR 830, Subpart B, "Safety Basis Requirements," <i>Code of Federal Regulations</i>, Office of the Federal Register, Current Revision.</p>

