



Air Quality Permitting
Technical Analysis

Permit to Construct No. 023-00001

U.S. Department of Energy - Idaho Operations Office
Idaho National Engineering and Environmental Laboratory

Test Reactor Area Evaporation Pond
Idaho Falls, Idaho

Prepared By:

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Project No. P-010509

Date Prepared:

August 27, 2002

Permit Status:

FINAL

PURPOSE

The purpose for this memorandum is to satisfy the requirements of IDAPA 58.01.01.200, *Rules for the Control of Air Pollution in Idaho* for issuing permits to construct (PTC).

PROJECT DESCRIPTION

The Department of Energy - Idaho Operations Office (DOE) is proposing to amend PTC No. 023-00001 issued on December 13, 1995, for the Idaho National Engineering and Environmental Laboratory's (INEEL) Test Reactor Area (TRA) evaporation pond.

The request includes changing the process description to reflect the maintenance and replacement of a process waste pipe and other editorial changes, to change the quarterly reporting due date from 30 days after the quarter to 45 days after the quarter, to make the operational requirements of the sodium iodide detector more specific, and to relieve the permittee of the requirement to perform weekly radiological surveys during weeks where inclement weather creates a safety concern. In addition, the requirements for the evaporation pond to comply with 40 CFR 61.93 have been removed as stated in an April 18, 1991 letter from the Idaho Department of Environmental Quality (Department) to the DOE.

SUMMARY OF EVENTS

September 25, 2001 The Department received an application from DOE for the amendment to the TRA evaporation pond PTC.

August 21, 2002 The Department received comments from DOE regarding the draft permit.

DISCUSSION

1. Process Description

The TRA evaporation pond (TRA-715) receives discharge from the warm wastewater system at the INEEL TRA. The warm waste water system consists of two 50 cubic foot (ft³) ion exchange beds in each of two warm waste-treatment facilities (WWTFs), the process water building (TRA-605), the retention basin inlet sump (TRA-712), and the evaporation pond pump station (TRA-716). Warm wastewater is typically processed through one mixed-ion exchange bed in the respective WWTF. The mixed-ion exchange beds are designed to remove radioactive impurities from essentially pure demineralized water. The mixed-ion exchange media are bypassed in situations involving high conductivity water and/or treatment of water where there would be no appreciable reduction in emissions.

The main discharge path is from the outlets of the WWTFs through the process water building (TRA-605) and the evaporation pond pump station (TRA-716) to the evaporation pond. The effluent water is monitored by the effluent radiation monitor (ERM) in the TRA-605 basement and sampled by the daily proportional sampling system in the TRA-636 building. Minor discharge paths include some buried piping from existing tanks and old reactor facilities which are routed directly to the retention basin inlet sump and infrequent discharges routed directly to the evaporation pond itself from generating sources both inside and outside of the TRA site. In cases where water is diverted around either the ERM or the daily proportional sampling system, the wastewater is sampled to confirm compliance with the emission limits section of the permit.

2. Equipment Listing

The equipment used at the evaporation pond is described in the Process Description above.

3. Emission Estimates

This action is a permit amendment. The allowable emissions have not been changed; therefore, emissions estimates were not calculated. The emission estimation method is detailed in the technical analysis dated November 24, 1995.

4. Modeling

Modeling is not required for this project because there is no increase in emissions associated with this permit amendment.

5. Facility Classification

The facility is a major facility as defined in IDAPA 58.01.01.006.55 and IDAPA 58.01.01.008.10. The Standard Industrial Classification Code is 9999, "not classifiable," and the Aerometric Information Retrieval System classification is "A" because actual emissions from the INEEL exceed 100 tons per year of a regulated air pollutant.

6. Area Classification

The portion of the facility that the TRA evaporation pond is on is located in Butte County, Air Quality Control Region 61. The attainment status for this area is designated as unclassifiable for all criteria pollutants.

7. Regulatory Review

IDAPA 58.01.01.201 - Permit to Construct Required

A permit amendment is required to reflect the actual process description and to allow additional time to submit quarterly reports.

IDAPA 58.01.01.210 - Demonstration of Preconstruction Compliance with Toxic Standards

No demonstration of preconstruction compliance with toxic standards is required for this permit amendment.

IDAPA 58.01.01.577 - Ambient Air Quality Standards for Specific Air Pollutants

No demonstration of compliance with ambient air quality standards is required for this permit amendment.

40 CFR 52 - Prevention of Significant Deterioration

This action does not trigger the requirements for prevention of significant deterioration review.

40 CFR 60 - New Source Performance Standards

No New Source Performance Standards apply to the TRA evaporation pond.

40 CFR 61 - National Emission Standards for Hazardous Air Pollutants

The INEEL is subject to 40 CFR 61.90, Subpart H - National Emission Standards for Emissions of Radionuclides other than Radon from Department of Energy Facilities.

8. Permit Requirements

8.1 Emission Limits

The TRA evaporation pond and all associated equipment must be operated in accordance with all applicable requirements contained in the National Emission Standards for Hazardous Air Pollutants (NESHAPS) for emissions of radionuclides from Department of Energy facilities (40 CFR 61.90). The emissions of radionuclides are limited to 27.1 Curies per month and 324.3 Curies per year for volatile radionuclide discharges and 42.6 Curies per month and 510.9 Curies per year for nonvolatile radionuclide discharges.

8.2 Operating Requirements

The permittee is required to calibrate and operate a sodium iodide detector (or equivalent alternative method) to monitor for gross gamma radiation in the effluent stream to the evaporation pond. An annual source check is required to be performed to ensure the sodium iodide detector is functioning properly. The source check must be performed in accordance with the Operations and Maintenance Manual 7.11.13.8.8 TRA-605 Effluent Radiation Monitor (ERM) System Chamber A and Chamber B Source Checks. The detector must trigger an alarm when the discharge stream radionuclide loading exceeds ten times the "normal" level. When the alarm sounds, the permittee is required to evaluate the cause of the alarm. If the cause is determined to be a resin bed malfunction, the permittee must place a backup mixed-ion exchange bed in service, or replace or regenerate the resin in the mixed-ion exchange bed within 24 hours of the alarm sounding. If the discharge stream radionuclide loading exceeds 100 times the "normal" levels, the discharge stream must be diverted to a 20,000-gallon interim storage tank. If the discharge stream radionuclide loading exceeds 1,000 times the "normal" levels, the discharge stream must be diverted to a 100,000-gallon interim storage tank. All water diverted to the 20,000-gallon and the 100,000-gallon interim storage tanks must be rerouted through the cleanup system prior to entering the evaporation pond. If required, the diverted water may be transported to the Idaho Chemical Processing Plant at the INEEL site or to some other facility for processing.

The "Normal" discharge or level is the amount of discharge that would cause radionuclides to be emitted at the values listed in Permit Condition 2.4 and above in the Emission Limits section of the technical analysis.

The permittee is also required to conduct daily proportional composite sampling on the effluent stream prior to the entry point to the evaporation pond. Each daily grab sample will be analyzed to demonstrate compliance with the nonvolatile radionuclide emission limit specified in Permit Condition 2.4. A composite sample will also be analyzed on a monthly basis using liquid scintillation counting methods to determine compliance with the volatile radionuclide emission limit specified in Permit Condition 2.4.

Each week, the permittee must perform radiological surveys of the pond liner, during the second and third quarters of each calendar year (April 1 to September 30). The permittee must decontaminate the liner as necessary to maintain contamination levels less than or equal to 10^5 disintegrations per minute per 100 square centimeters of any exposed evaporation pond liner (10^5 dpm/100 cm²). However, if inclement weather causes unsafe radiological survey work, the permittee may forgo the survey during the week of inclement weather.

Every quarter the permittee is required to submit report to the Department summarizing the results of the discharge stream monitoring required in Permit Condition 2.7. The report must contain an estimate of the amount of radionuclides discharged to the evaporation pond (in Curies) during each reporting period. The report will distinguish between volatile and nonvolatile radionuclide emissions, be based on a quarter calendar year, and is due to the Department no later than 45 days after the end of each quarter.

9. Permit Coordination

A Tier I operating permit is currently being drafted for the INEEL. A copy of this PTC amendment will be made available to the permit engineers for incorporation into the Tier I operating permit.

10. AIRS Information

AIRS/AFS^a FACILITY-WIDE CLASSIFICATION^b DATA ENTRY FORM

AIR PROGRAM	SIP ^c	PSD ^d	NSPS ^e (Part 60)	NESHAP ^f (Part 61)	MACT ^g (Part 63)	TITLE V	AREA CLASSIFICATION
POLLUTANT							A – Attainment U – Unclassifiable N – Nonattainment
SO ₂ ^h	A	A				A	U
No _x ⁱ	A	A				A	U
CO ^j	A					A	U
PM ₁₀ ^k	A	A				A	U
PT (Particulate) ^l	A					A	NA
VOC ^m	A					A	U
THAP (Total HAPs) ⁿ	A						NA
			APPLICABLE SUBPART				
			H				

^a Aerometric Information Retrieval System (AIRS) Facility Subsystem (AFS)

^b AIRS/AFS Classification Codes:

- A = Actual or potential emissions of a pollutant are above the applicable major source threshold. For NESHAP only, class "A" is applied to each pollutant which is below the 10 ton-per-year (T/yr) threshold, but which contributes to a plant total in excess of 25 T/yr of all NESHAP pollutants.
- SM = Potential emissions fall below applicable major source thresholds if and only if the source complies with federally enforceable regulations or limitations.
- B = Actual and potential emissions below all applicable major source thresholds.
- C = Class is unknown.
- ND = Major source thresholds are not defined (e.g., radionuclides).

^c State Implementation Plan

^d Prevention of Significant Deterioration

^e New Source Performance Standards

^f National Emission Standards for Hazardous Air Pollutants

^g Maximum Achievable Control Technology

^h Sulfur Dioxide

ⁱ Nitrogen Oxides

^j Carbon Monoxide

^k Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers

^l Particulate Matter

^m Volatile Organic Compounds

ⁿ Hazardous Air Pollutants

FEES

The DOE INEEL facility is a major facility as defined in IDAPA 58.01.01.008.10 and is therefore subject to registration and registration fees in accordance with IDAPA 58.01.01.387. This PTC amendment will not increase annual fees.

RECOMMENDATION

Based on review of application materials and all applicable state and federal rules and regulations, staff recommends DOE INEEL be issued amended PTC No. 023-00001 for the TRA evaporation pond. No public comment period is recommended, no entity has requested a comment period, and the project does not involve PSD requirements.

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cc: Rensay Owen, Idaho Falls Regional Office
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