



Idaho National Laboratory SEC-00219 Update

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Advisory Board on Radiation and Worker Health, 147th Meeting

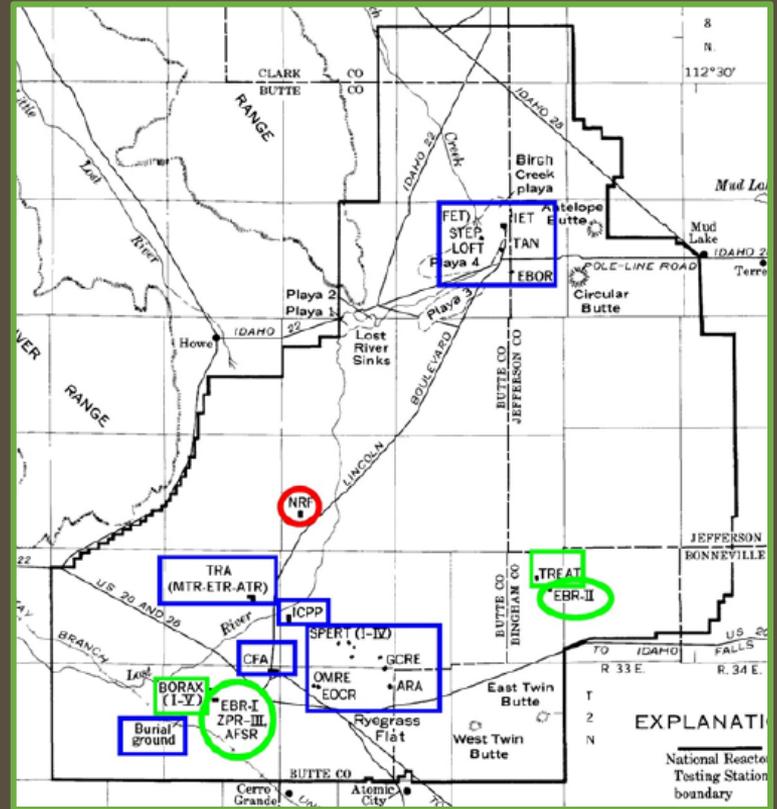
Teleconference

August 17, 2022

Overview

- Petition information
- Facility background and feasibility determination
- Update on current SEC-00219 tasks
 - Last INL/ANL-W WG meeting was on July 16, 2020

Petition Information



Other INL Related SEC Petitions and Classes

Petition

NIOSH Recommended SEC Class

SEC-00172

Did not qualify

SEC-00219

Chemical Processing Plant (CPP) workers (1963 – 1974)

**SEC-00238
(83.14)**

CPP workers who wore at least one film badge or TLD
between January 1, 1975 and December 31, 1980

SEC-00219 Petition

- Petition received on July 8, 2014 for requested class:
 - *All employees who worked in any area of the Idaho National Laboratory from January 1, 1949 through December 31, 1970.*

- Petition qualified on September 16, 2014 for class:
 - *All employees who worked in any area of the Idaho National Laboratory from January 1, 1949 through December 31, 1970.*

- Evaluation Reports sent to ABRWH:
 - Rev 0: March 12, 2015
 - Rev 1: July 21, 2015
 - Discovered change in administration of external dosimeters at INL
 - Revised class definition
 - Rev 2: February 22, 2017
 - Completed evaluation of three reserved areas: 1) TAN-607/TAN-615 2) ARA-I ²³³Pa separation, and 3) the initial drum retrieval at the Burial Ground
 - No revision to class definition

SEC-00219 Class Definition

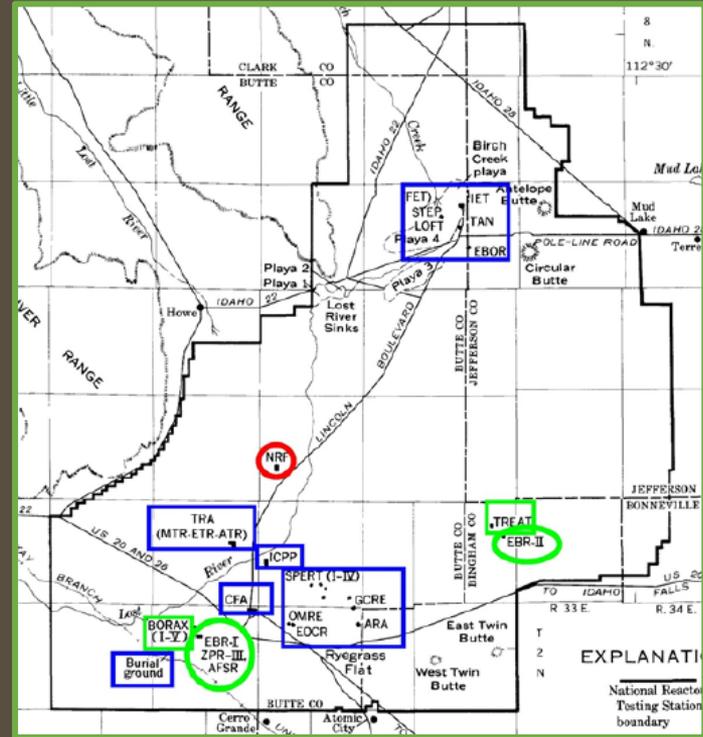
All employees of the Department of Energy, its predecessor agencies, and their contractors and subcontractors who worked at the Idaho National Laboratory (INL) in Scoville, Idaho, and

- a) who were monitored for external radiation at the Idaho Chemical Processing Plant (CPP) (e.g., at least one film badge or TLD dosimeter from CPP) between January 1, 1963 and February 28, 1970; or*
- b) who were monitored for external radiation at INL (e.g., at least one film badge or TLD dosimeter) between March 1, 1970 and December 31, 1974 for a number of work days aggregating at least 250 work days, occurring either solely under this employment, or in combination with work days within the parameters established for one or more other classes of employees in the Special Exposure Cohort.*

SEC-00238 (83.14)

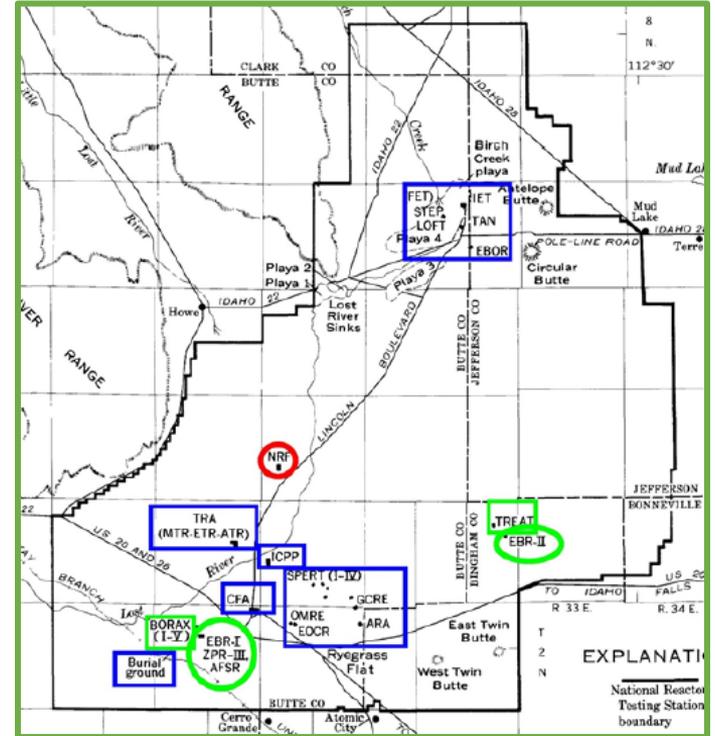
- Petition received on March 16, 2017
- Petition qualified on March 22, 2017
- Evaluation Report sent to ABRWH July 27, 2017
- SEC Class Definition:
 - *All employees of the Department of Energy, its predecessor agencies, and their contractors and subcontractors who worked at the Idaho National Laboratory (INL) in Scoville, Idaho, and who were monitored for external radiation at the Idaho Chemical Processing Plant (CPP) (e.g., at least one film badge or TLD dosimeter from CPP) between January 1, 1975 and December 31, 1980.*
- Extended class through 1980 when routine plutonium bioassay program implemented at CPP

Site Background & Feasibility Determination



Idaho National Laboratory– Site Description

- Major Areas
 1. Test Reactor Area (TRA)
 2. Idaho Chemical Processing Plant (ICPP)
 3. Test Area North (TAN)
 4. Miscellaneous Reactor Areas
 5. Central Facilities Area (CFA)
 6. Burial Ground



SEC-00219 Evaluation Report, Figure 5-2

Idaho National Laboratory – Feasibility Conclusion

SEC00219

Table 7-18: Summary of INL Feasibility Determinations by Operating Area (1949-1974)

INL Operating Area	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74
Test Reactor Area	N	N	N	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	C	C	C	C	N	N	N	N
Chemical Processing Plant	N	N	N	N	F	F	F	F	F	F	F	F	F	F	I	I	I	I	I	I	I	I	I	I	I	I
Test Area North	N	N	N	N	N	N	F	F	F	F	F	F	F	F	F	F	F	F	C	C	C	C	N	N	N	N
Misc. Reactor Areas	N	N	N	N	N	N	F	F	F	F	F	F	F	F	F	F	F	F	C	C	C	C	N	N	N	N
Central Facilities Area	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	C	C	C	C	N	N	N	N
Burial Ground	N	N	N	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	C	C	C	C	N	N	N	N

F = Dose reconstructions are feasible.

C = Dose reconstructions are feasible but a mixed-fission-product co-worker model is needed.

I = Dose reconstructions are infeasible.

N = Prior to radiological operations or outside of evaluation period

SEC00238

83.14 evaluation extended SEC class for CPP workers through December 31, 1980.

Update on Current SEC-00219 Tasks

Idaho National Laboratory – Current Tasks

- I. INL/ANL-W Reactor Evaluations
- II. Burial Ground/Radioactive Waste Management Complex (RWMC)
- III. INL/ANL-W Co-Exposure Models

I. INL/ANL-W Reactor Evaluations (1/4)

- In 2015/2016, as part of the SEC-00219 and SEC-00224 ER reviews, SC&A performed preliminary assessments as to whether the OTIB-0054 approach for addressing potential intakes of mixed fission and activation products (MFAPs) would adequately envelope all reactor and operating scenarios at INL and ANL-W
- The site was of primary interest because of the 52 unique reactors built there as prototypes, with various reactor configurations, fuel types and operating histories.
- Reactors were categorized by NIOSH and SC&A as high, medium and low priority based on the potential for underestimation of worker doses.

I. INL/ANL-W Reactor Evaluations (2/4)

- OTIB-0054 is a methodology for the assignment of radionuclide-specific intakes of MFAPs for use in the dose reconstruction when data associated with worker exposures are available only as gross or total beta or gamma activities.
<https://www.cdc.gov/niosh/ocas/pdfs/tibs/or-t54-r4.pdf>
- The assignment of radionuclide-specific intakes of MFAPs relative to an indicator radionuclides:
 - ^{90}Sr for gross beta
 - ^{137}Cs for gross gamma

I. INL/ANL-W Reactor Evaluations (3/4)

- ORAUT-RPRT-0099, *Evaluation of EBR-II and BORAX-IV for OTIB-0054 Applicability* presented at July 16, 2020 INL/ANL-W Work Group meeting. <https://www.cdc.gov/niosh/ocas/pdfs/orau/oraurpts/or-rprt-99-r0-508.pdf>
- Extensive reactor modeling required
- Objective of report was to analyze the potential organ doses to workers at EBR-II and BORAX-IV, two high-priority reactors to determine if OTIB-0054 provides a bounding internal dose computational approach.
 - SC&A concurred on January 15, 2021 [Review of ORAUT-RPRT-0099 Evaluation of EBR-II and BORAX-IV for ORAUT-OTIB-0054 Applicability \(cdc.gov\)](#)
- OTIB-0054 approach bounding for EBR-II and BORAX-IV

I. INL/ANL-W Reactor Evaluations (4/4)

- ORAUT-RPRT-0100, *Evaluation of Predicted Cesium-137 Intakes Using Site Whole Body Counting Detection Capabilities to Demonstrate that ORAUT-OTIB-0054 Bounds Worker Doses at INL and ANL-W*
- The purpose of the report is to present the results from an evaluation of the INL WBC detection capabilities against the mixed fission and activation products (MFAPs) calculated using the OTIB-0054 methodology for both an OTIB-0054 reactor case and the MTR Phoenix plutonium core case.
- ORAUT-RPRT-0100 under review by DCAS

II. Burial Ground/Radioactive Waste Management Complex (RWMC)

- During the July 16, 2020 INL/ANL-W Work Group teleconference meeting, questions about the airborne concentrations of transuranic radionuclides to which Burial Ground/Radioactive Waste Management Complex (RWMC) workers may have been exposed were raised.
- A data request requested a search of the Electronic Data Management System (EDMS) using five facility names and 22 keywords for air sampling and contamination data for 1963-1978 result in thousands of documents.
- This led NIOSH to request remote access to EDMS to reduce the number of applicable documents.

II. Burial Ground/RWMC cont'd: EDMS Access Timeline

Date	Action
7/30/2020	Initial data request (FY20-002) sent to DOE-ID POC for Burial Ground/RWMC air sampling and removable contamination surveys. Included 22 keywords.
11/10/2020	Received an encrypted drive with spreadsheet for results for 22 keywords (1000 results).
11/12/2020	Information was not what was expected and necessitated conference calls with INL to discuss.
6/10/2021	INL supplied requested information but were hyperlinks to EDMS search results. Do not have remote access to EDMS.
7/2/2021	Data request FY21-001 requests remote access to EDMS for NIOSH, SC&A, and ORAU Team personnel
2/1/2022	S numbers assigned by INL to those requesting remote EDMS access.
6/2/2022	Queries of EDMS for Burial Ground/RWMC air sampling and contamination data for 1963-1978 begins. Review of query results for provided keywords performed by INL Records Center staff sent 6/10/21 also being reviewed.

III. INL/ANL-W Co-Exposure Models

- SEC-00219 Evaluation Report identified the need for a mixed fission products (MFPs) co-exposure model beginning in 1967 due to a change in *in-vivo* counting protocols.
- DCAS Implementation Guide for Co-Exposure Models presented to the ABRWH at the July 2015 meeting. Savannah River and INL/ANL-W were identified as test cases to demonstrate methodology.
- Major effort to create complete *in-vitro* and *in-vivo* databases for INL up to 1995 from:
 - Hard copy records
 - BADGER

III. INL/ANL-W Co-Exposure Models Developed

1. Gross beta in urine (1953-1960)
2. Cs-137 by whole body count (1961-1995)
3. Total uranium in urine for all facilities (1953-1962)
 - Need identified by SC&A during review of SEC-00219 Evaluation Report
4. Total uranium in urine for SMC at TAN (1987-1995)
5. Isotopic uranium in urine (1981-1995)
6. Isotopic plutonium in urine (1981-1995)
 - Pu-238
 - Pu-239

III. Current Status of INL/ANL-W Co-Exposure

- Initially the INL/ANL-W co-exposure document was an OTIB but has been converted to a TKBS chapter
- ORAUT-TKBS-0007-7: *Internal Dosimetry Co-Exposure Data for Idaho National Laboratory and Argonne National Laboratory-West*
- Undergoing internal review

Questions?

For more information, contact CDC
1-800-CDC-INFO (232-4636)
TTY: 1-888-232-6348 www.cdc.gov

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

