SEC Petition Evaluation Report

Petition SEC-00230

Report Rev Number:	0
Report Submittal Date:	July 12, 2016
Subject Expert(s):	Roger Halsey, Mutty Sharfi
Site Expert(s):	N/A

Petition Administrative Summary

Petition Under Evaluation

Petition Number:	SEC-00230
Petition Type:	83.13
Petition Receipt Date:	March 1, 2016
Qualification Date:	May 10, 2016
DOE/AWE Facility Name:	Bliss & Laughlin Steel

Petition Class

Petitioner-Requested Class Definition:	All employees of the Bliss & Laughlin Steel Company located at 110 Hopkins Street, Buffalo, New York, during the period from January 1, 1951 through January 31, 1999.
Class Evaluated by NIOSH:	All atomic weapons employees who worked in any area at the Bliss & Laughlin Steel site in Buffalo, New York, during the period from January 1, 1999 through December 31, 1999.
NIOSH-Proposed Class to be Added to the SEC:	None

Related Petition Summary Information

SEC Petition Tracking Number(s):	SEC-00131
Petition Type:	83.13
DOE/AWE Facility Name:	Bliss & Laughlin Steel Company
Petition Status:	Class not added

Related Evaluation Report Information

Report Title:	SEC Petition Evaluation Report for Petition SEC-00131
DOE/AWE Facility Name:	Bliss & Laughlin Steel Company

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Evaluation Report Summary: SEC-00230, Bliss & Laughlin Steel

The National Institute for Occupational Safety and Health (NIOSH) prepared this evaluation report in response to a petition to add a class of workers at Bliss & Laughlin Steel to the Special Exposure Cohort (SEC). The *Energy Employees Occupational Illness Compensation Program Act of 2000*, as Bliss & Laughlin Steelamended, (EEOICPA) and 42 C.F.R. pt. 83, *Procedures for Designating Classes of Employees as Members of the Special Exposure Cohort under the Energy Employees Occupational Illness Compensation Program Act of 2000* describe the process for considering the addition of classes to the SEC.

Petitioner-Requested Class Definition

NIOSH received petition SEC-00230 on March 1, 2016, and qualified it on May 10, 2016. The petitioner requested that NIOSH consider the following class: *All employees of the Bliss & Laughlin Steel Company located at 110 Hopkins Street, Buffalo, New York, during the period from January 1, 1951 through January 31, 1999.*

Class Evaluated by NIOSH

In 2009, NIOSH evaluated petition SEC-00131 for a class that covered all employees of Bliss & Laughlin Steel. That petition and evaluation report addressed the site's Atomic Weapons Employer (AWE) operational period from January 1, 1951 through December 31, 1952, and the residual radiation period from January 1, 1953 through December 31, 1998 (NIOSH, 2009). At the time of NIOSH's evaluation of SEC-00131, the covered residual radiation period for the Bliss & Laughlin site ended on December 31, 1998. Subsequent to NIOSH's 2009 evaluation, the covered residual radiation period for the site was extended to include calendar year 1999.

The petitioner-requested evaluation period for SEC-00230 includes all the dates in the previously evaluated class, plus one additional month. Based on its preliminary research, NIOSH determined that the petition and supporting documents did not provide substantially new information and therefore did not meet the criteria required to re-examine the period previously evaluated in SEC-00131[1]. The only portion of the petitioner-requested class that had not previously been evaluated by NIOSH includes the period from January 1, 1999 through January 31, 1999. For completeness, NIOSH extended the period for the class under evaluation for this report through December 31, 1999, the end of the currently defined residual radiation period. The NIOSH-evaluated class includes all atomic weapons employees who worked in any area at the Bliss & Laughlin Steel site in Buffalo, New York, during the period from January 1, 1999 through December 31, 1999.

NIOSH Determination about the Proposed Class to be Added to the SEC

NIOSH has access to site-specific area monitoring data that characterize the site during the 1999 residual period and before. NIOSH can apply these data with methods previously reviewed by the Advisory Board on Radiation and Worker Health that are specific to the Bliss & Laughlin Steel site.

[1] 42 CFR § 83.9(c)(5)

Based on its analysis of these available resources, NIOSH found no part of the class under evaluation for which it cannot estimate radiation doses with sufficient accuracy.

Feasibility of Dose Reconstruction

Per EEOICPA and 42 C.F.R. § 83.13(c) (1), NIOSH has established that it has access to sufficient information to: (1) estimate the maximum radiation dose, for every type of cancer for which radiation doses are reconstructed, that could have been incurred in plausible circumstances by any member of the class; or (2) estimate radiation doses of members of the class more precisely than an estimate of maximum dose. Information available from the site profile and additional resources is sufficient to estimate the maximum internal and external potential exposure to members of the evaluated class under plausible circumstances during the specified period.

The NIOSH dose reconstruction feasibility findings are based on the following:

- In 2009, NIOSH evaluated petition SEC-00131 for a class of workers at Bliss & Laughlin Steel during the AWE operational period from January 1, 1951 through December 31, 1952, and during the residual radiation period from January 1, 1953 through December 31, 1998. In March 2011, the Advisory Board on Radiation and Worker Health concurred that NIOSH had access to adequate exposure monitoring and other information necessary to perform individual dose reconstructions with sufficient accuracy for the period from January 1, 1951 through December 31, 1998. Subsequent to NIOSH's 2009 evaluation, the covered period for the site was extended to include calendar year 1999.

- During the months January through March 1999, the US Army Corps of Engineers (USACE) remediated uranium contamination in the Special Finishing Area at Bliss & Laughlin Steel. The scope of work for the remediation included specific contamination control measures including: scheduling work for weekends and holidays; enclosures with HEPA filtration; HEPA vacuuming of areas; use of air monitors and confirmatory surveys for contamination control; and restoration of remediated areas to a usable condition for general site employees at the end of each remediation workday.

- Principal sources of internal and external radiation for members of the proposed class included exposures to residues of natural uranium metal and short-lived progeny resulting in possible direct external exposure, and possible internal exposure through inhalation or ingestion.

- The assignment of medical X-ray dose is not required during residual radiation periods for AWE facilities. Consequently, NIOSH concludes that it is not applicable to reconstruct occupational medical dose for Bliss & Laughlin Steel workers during the period being evaluated from January 1, 1999 through December 31, 1999.

- NIOSH has examined the workplace monitoring data available for the remediation activities in the period under evaluation. NIOSH finds no indications of increased exposures to site AWE employees resulting from the well-controlled remediation activities performed by USACE through March 1999. Site contamination levels after the remediation were significantly reduced.

- NIOSH has determined that the internal and external dose reconstruction approaches for AWE employees through December 31, 1998, as reviewed in 2011 by the Advisory Board on Radiation

and Worker Health for SEC-00131, are applicable and bounding for AWE employees at the Bliss & Laughlin Steel site between January 1, 1999 and December 31, 1999.

Health Endangerment Determination

Per EEOICPA and 42 C.F.R. § 83.13(c) (3), a health endangerment determination is not required because NIOSH has determined that it has sufficient information to estimate dose for the members of the evaluated class.

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SEC Petition Evaluation Report for SEC-00230

ATTRIBUTION AND ANNOTATION: This is a single-author document. All conclusions drawn from the data presented in this evaluation were made by the ORAU Team Lead Technical Evaluator: Roger Halsey, Oak Ridge Associated Universities (ORAU). The rationales for all conclusions in this document are explained in the associated text.

1.0 Purpose and Scope

This report evaluates the feasibility of reconstructing doses for all atomic weapons employees who worked in any area at the Bliss & Laughlin Steel site in Buffalo, New York, during the period from January 1, 1999 through December 31, 1999. It provides information and analyses germane to considering a petition for adding a class of employees to the congressionally-created SEC.

This report does not make any determinations concerning the feasibility of dose reconstruction that necessarily apply to any individual energy employee who might require a dose reconstruction from NIOSH. This report also does not contain the final determination as to whether the proposed class will be added to the SEC (see Section 2.0).

This evaluation was conducted in accordance with the requirements of EEOICPA, 42 C.F.R. pt. 83, and the guidance contained in the Division of Compensation Analysis and Support's (DCAS) *Internal Procedures for the Evaluation of Special Exposure Cohort Petitions*, DCAS-PR-004.[2]

2.0 Introduction

Both EEOICPA and 42 C.F.R. pt. 83 require NIOSH to evaluate qualified petitions requesting that the Department of Health and Human Services (HHS) add a class of employees to the SEC. The evaluation is intended to provide a fair, science-based determination of whether it is feasible to estimate with sufficient accuracy the radiation doses of the class of employees through NIOSH dose reconstructions.[3]

42 C.F.R. § 83.13(c)(1) states: *Radiation doses can be estimated with sufficient accuracy if NIOSH has established that it has access to sufficient information to estimate the maximum radiation dose, for every type of cancer for which radiation doses are reconstructed, that could have been incurred in plausible circumstances by any member of the class, or if NIOSH has established that it has access to sufficient information to estimate the radiation doses of members of the class more precisely than an estimate of the maximum radiation dose.*

Under 42 C.F.R. § 83.13(c)(3), if it is not feasible to estimate with sufficient accuracy radiation doses for members of the class, then NIOSH must determine that there is a reasonable likelihood that such radiation doses may have endangered the health of members of the class. The regulation requires

[2] DCAS was formerly known as the Office of Compensation Analysis and Support (OCAS).

[3] NIOSH dose reconstructions under EEOICPA are performed using the methods promulgated under 42 C.F.R. pt. 82 and the detailed implementation guidelines available at http://www.cdc.gov/niosh/ocas/.

NIOSH to assume that any duration of unprotected exposure may have endangered the health of members of a class when it has been established that the class may have been exposed to radiation during a discrete incident likely to have involved levels of exposure similarly high to those occurring during nuclear criticality incidents. If the occurrence of such an exceptionally high-level exposure has not been established, then NIOSH is required to specify that health was endangered for those workers who were employed for at least 250 aggregated work days within the parameters established for the class or in combination with work days within the parameters established for one or more other SEC classes.

NIOSH is required to document its evaluation in a report, and to do so, relies upon both its own dose reconstruction expertise as well as technical support from its contractor, Oak Ridge Associated Universities (ORAU). Once completed, NIOSH provides the report to both the petitioner(s) and the Advisory Board on Radiation and Worker Health (referred to as Advisory Board throughout this report). The Advisory Board will consider the NIOSH evaluation report, together with the petition, petitioner(s) comments, and other information the Advisory Board considers appropriate, in order to make recommendations to the Secretary of HHS on whether or not to add one or more classes of employees to the SEC. Once NIOSH has received and considered the advice of the Advisory Board, the Director of NIOSH will propose a decision on behalf of HHS. The Secretary of HHS will make the final decision, taking into account the NIOSH evaluation, the advice of the Advisory Board, and the proposed decision issued by NIOSH. As part of this decision process, petitioners may seek a review of certain types of final decisions issued by the Secretary of HHS.[4]

3.0 SEC-00230, Bliss & Laughlin Steel Class Definitions

The following subsections address the evolution of the class definition for SEC-00230, Bliss & Laughlin Steel. When a petition is submitted, the requested class definition is reviewed as submitted. Based on its review of the available site information and data, NIOSH will make a determination whether to qualify for full evaluation all, some, or no part of the petitioner-requested class. If some portion of the petitioner-requested class is qualified, NIOSH will specify that class along with a justification for any modification of the petitioner's class. After a full evaluation of the qualified class, NIOSH will determine whether to propose a class for addition to the SEC and will specify that proposed class definition.

3.1 Petitioner-Requested Class Definition and Basis

Petition SEC-00230 was received on March 1, 2016, and qualified on May 10, 2016. The petitioner requested that NIOSH consider the following class: *All employees of the Bliss & Laughlin Steel Company located at 110 Hopkins Street, Buffalo, New York, during the period from January 1, 1951 through January 31, 1999.*

The petitioner provided information in support of the petitioner's belief that accurate dose reconstruction over time is impossible for the Bliss & Laughlin Steel workers in question. The petition qualified on the basis that radiation exposures and radiation doses potentially incurred

[4] See 42 C.F.R. pt. 83 for a full description of the procedures summarized here. Additional internal procedures are available at http://www.cdc.gov/niosh/ocas/.

by members of the proposed class were not monitored either through personal monitoring or through area monitoring. NIOSH deemed the following information sufficient to qualify SEC-00230 for evaluation:

- The petitioner included the statement "No health monitoring."

- The NIOSH evaluation report for SEC-00131 was submitted as a supporting document for this petition. The SEC-00131 report evaluated all employees of Bliss & Laughlin Steel for the period from January 1, 1951 through December 31, 1952, and during the residual radiation period from January 1, 1953 through December 31, 1998. The NIOSH report indicated that there was no employee monitoring during the residual radiation period from 1953 through 1998, supporting the petitioner's basis for SEC-00230. As noted previously, subsequent to NIOSH's 2009 evaluation, the residual radiation period was extended through December 31, 1999.

Based on its Bliss & Laughlin Steel research and data capture efforts, NIOSH determined that it has access to survey data that characterize the site during the residual radiation period for Bliss & Laughlin Steel workers during the time period under evaluation. However, NIOSH found no monitoring data for the workers during the period from January 1, 1999 through December 31, 1999. NIOSH concluded that there is sufficient documentation to support, for at least part of the requested time period, the petition basis that internal and external radiation exposures and radiation doses were not adequately monitored at Bliss & Laughlin Steel, either through personal monitoring or area monitoring. The information and statements provided by the petitioner qualified the petition for further consideration by NIOSH, the Advisory Board, and HHS. The details of the petition basis are addressed in Section 7.4.

3.2 Class Evaluated by NIOSH

In 2009, NIOSH evaluated petition SEC-00131 for a class that covered all employees of Bliss & Laughlin Steel. That petition and evaluation report addressed the site's AWE operational period from January 1, 1951 through December 31, 1952, and the residual radiation period from January 1, 1953 through December 31, 1998 (NIOSH, 2009). At the time of NIOSH's evaluation of SEC-00131, the covered residual radiation period for the Bliss & Laughlin site ended on December 31, 1998. Subsequent to NIOSH's 2009 evaluation, the covered residual radiation period for the site was extended to include calendar year 1999.

The petitioner-requested evaluation period for SEC-00230 includes all the dates in the previously evaluated class, plus one additional month. Based on its preliminary research, NIOSH determined that the petition and supporting documents did not provide substantially new information and therefore did not meet the criteria required to re-examine the period previously evaluated in SEC-00131. The only portion of the SEC-00230 petitioner-requested class that had not been previously evaluated by NIOSH includes the time between January 1, 1999 and January 31, 1999. For completeness, the period for the class under evaluation for this report was extended through December 31, 1999, the end of the currently defined residual radiation period. The NIOSH-evaluated class includes all atomic weapons employees who worked in any area at the Bliss & Laughlin Steel site in Buffalo, New York, during the period from January 1, 1999 through December 31, 1999.

3.3 NIOSH Determination about the Proposed Class to be Added to the SEC

NIOSH has access to site-specific area monitoring data that characterize the site during the 1999 residual period and before. NIOSH can apply these data with methods previously reviewed by the Advisory Board that are specific to the Bliss & Laughlin Steel site. Based on its analysis of these available resources, NIOSH found no part of the class under evaluation for which it cannot estimate radiation doses with sufficient accuracy.

4.0 Data Sources Reviewed by NIOSH to Evaluate the Class

As is standard practice, NIOSH completed an extensive database and Internet search for information regarding Bliss & Laughlin Steel. The database search included the Department of Energy (DOE) Legacy Management Considered Sites database, the DOE Office of Scientific and Technical Information (OSTI) database, the Energy Citations database, and the Hanford Declassified Document Retrieval System. In addition to general Internet searches, the NIOSH Internet search included OSTI Information Bridge searches, Nuclear Regulatory Commission (NRC) Agency-wide Documents Access and Management (ADAMS) web searches, and the DOE-National Nuclear Security Administration-Nevada Site Office-search. Attachment One contains a summary of Bliss & Laughlin Steel documents. The summary specifically identifies data capture details and general descriptions of the documents retrieved.

In addition to the database and Internet searches listed above, NIOSH identified and reviewed numerous data sources to determine information relevant to determining the feasibility of dose reconstruction for the class of employees under evaluation. This included determining the availability of information on personal monitoring, area monitoring, industrial processes, and radiation source materials. The following subsections summarize the data sources identified and reviewed by NIOSH.

4.1 Site Profile Technical Basis Documents (TBDs)

A Site Profile provides specific information concerning the documentation of historical practices at the specified site. Dose reconstructors can use the Site Profile to evaluate internal and external dosimetry data for monitored and unmonitored workers, and to supplement, or substitute for, individual monitoring data. A Site Profile consists of an Introduction and five Technical Basis Documents (TBDs) that provide process history information, information on personal and area monitoring, radiation source descriptions, and references to primary documents relevant to the radiological operations at the site. The Site Profile for a small site may consist of a single document. As part of NIOSH's evaluation detailed herein, it examined the following TBDs/site profile for insights into Bliss & Laughlin Steel operations or related topics/operations at other sites:

- *Site Profiles for Atomic Weapons Employers that Worked Uranium Metals, Appendix D, Bliss and Laughlin Steel*, Battelle-TBD-6000, Appendix D; Rev. 0; effective September 11, 2012; SRDB Ref ID: 118507

- *Site Profiles for Atomic Weapons Employers that Worked Uranium Metals*, Battelle-TBD-6000; Rev. 1; effective June 17, 2011; SRDB Ref ID: 101251

4.2 ORAU Technical Information Bulletins (OTIBs) and Procedures

An ORAU Technical Information Bulletin (OTIB) is a general working document that provides guidance for preparing dose reconstructions at particular sites or categories of sites. An ORAU Procedure provides specific requirements and guidance regarding EEOICPA project-level activities, including preparation of dose reconstructions at particular sites or categories of sites. NIOSH reviewed the following OTIBs as part of its evaluation:

- *OTIB: Dose Reconstruction from Occupationally Related Diagnostic X-Ray Procedures*, ORAUT-OTIB-0006, Rev. 04; effective June 20, 2011; SRDB Ref ID: 98147

- *OTIB: Guidance on Assigning Occupational X-ray Dose Under EEOICPA for X-Rays Administered Off Site*, ORAUT-OTIB-0079, Rev.01; effective March 18, 2016; SRDB Ref ID: 152173

4.3 Facility Employees and Experts

To obtain additional information in support of its 2009 evaluation of petition SEC-00131, NIOSH attempted to interview four former Bliss & Laughlin employees. A review of Bliss & Laughlin claimants showed that most are deceased or not employed during the period then under evaluation. Details regarding the interviews that were conducted for SEC-00131 can be found in the SEC-00131 Bliss & Laughlin Steel Co. evaluation report (NIOSH, 2009). Additional interviews for the specific purpose of supporting this SEC-00230 evaluation were not considered likely to produce new information for the period under evaluation. Additional interviews were therefore not conducted.

4.4 Previous Dose Reconstructions

NIOSH reviewed its NIOSH DCAS Claims Tracking System (referred to as NOCTS) to locate EEOICPA-related dose reconstructions that might provide information relevant to the petition evaluation. Table 4-1 summarizes the results of this review. (NOCTS data available as of June 9, 2016)

Table 4-1: No. of Bliss & Laughlin Steel Claims Submitted Under the Dose Reconstruction Rule

Description	Totals
Total number of claims submitted for dose reconstruction	54
Total number of claims submitted for energy employees who worked during the period under evaluation (January 1, 1999 through December 31, 1999)	10
Number of dose reconstructions completed for energy employees who worked during the period under evaluation (i.e., the number of such claims completed by NIOSH and submitted to the Department of Labor for final approval).	9
Number of claims for which internal dosimetry records were obtained for the identified years in the evaluated class definition	0
Number of claims for which external dosimetry records were obtained for the identified years in the evaluated class definition	0

NIOSH reviewed each claim to determine whether internal and/or external personal monitoring records could be obtained for the employee. NIOSH has obtained no personnel internal or external

monitoring data for any Bliss & Laughlin Steel claimants for the period under evaluation. However, workplace monitoring data are available as discussed in the following sections.

4.5 NIOSH Site Research Database

NIOSH also examined its Site Research Database (SRDB) to locate documents supporting the assessment of the evaluated class. There were 163 documents in this database that were identified as pertaining to Bliss & Laughlin Steel. These documents were evaluated for their relevance to this petition. The documents include historical background on operations during the AWE production period (including progress reports and contamination control methods) and background information on the remediation process (including planning documents, pre-remediation contamination surveys, and post-remediation contamination surveys).

4.6 Documentation and/or Affidavits Provided by Petitioners

In qualifying and evaluating the petition, NIOSH reviewed the following documents submitted by the petitioners:

- *Office of Workers' Compensation Programs, Division of Energy Employees Occupational Illness Compensation (DEEOIC), New York Resource Center Handout*; Department of Labor (DOL); printed September 18, 2015; DSA Ref ID: 126493

- *EEOICPA Information*, screenshot of website page; Lipsitz & Ponterio, LLC Attorneys at Law; printed September 23, 2014; DSA Ref ID: 126494

- *Summary Notes of Technical Issues Raised at the Bethlehem Steel Meeting Held in Hamburg, NY, June 21, 2006*; Final Notes on July 23, 2006; DSA Ref ID: 126495

- *Site Profiles for Atomic Weapons Employers that Worked Uranium Metals, Appendix D, Bliss and Laughlin Steel*, Battelle-TBD-6000, Appendix D; Rev. 0; Division of Compensation Analysis and Support (DCAS); effective September 11, 2012; SRDB Ref ID: 118507, DSA Ref ID: 126496

- *Correspondence to the Secretary of Defense regarding Responsibility for* FUSRAP; Federico Pena; October 10, 1997; DSA Ref ID: 126497

- *SEC Petition Evaluation Report for Petition SEC-00131, Bliss and Laughlin Steel Company*; National Institute for Occupational Safety and Health (NIOSH); June 30, 2009; SRDB Ref ID: 156493, DSA Ref ID: 126498

- *Review of the Potential for Residual Contamination at Bethlehem Steel Corporation*; Grady Calhoun, Samuel Glover, and James Neton; May 23, 2013; DSA Ref ID: 126499

- *Advisory Board on Radiation and Worker Health, Review of NIOSH Site Profile for Bethlehem Steel Plant, Lackawanna, NY*; S. Cohen & Associates; October 2004; DSA Ref ID: 126500

- *Report on Residual Radioactive and Beryllium Contamination at Atomic Weapons Employer Facilities and Beryllium Vendor Facilities*; National Institute for Occupational Safety and Health (NIOSH), Division of Compensation Analysis and Support (DCAS); August 2011; DSA Ref ID: 126501

- *Radiological Survey of the Former Bliss and Laughlin Steel Company Facility Buffalo, New York*; T. J. Vitkus; January 1995; DSA Ref ID: 126502

- *Radiological Survey of the Former Bliss and Laughlin Steel Company Facility Buffalo, New York*; J. D. Berger; June 1992; DSA Ref ID: 126503

5.0 Radiological Operations Relevant to the Class Evaluated by NIOSH

The following subsections summarize both radiological operations at Bliss & Laughlin Steel from January 1, 1999 through December 31, 1999, and the information available to NIOSH to characterize particular processes and radioactive source materials. From available sources NIOSH has gathered process and source descriptions, information regarding the identity and quantities of each radionuclide of concern, and information describing processes through which radiation exposures may have occurred and the physical environment in which they may have occurred. The information included within this evaluation report is intended only to be a summary of the available information.

5.1 Bliss & Laughlin Steel Plant and Process Descriptions

The former Bliss & Laughlin Steel site is a 366,000 ft^2 tract located at 110 Hopkins Street in Lackawanna, New York, a suburb approximately four miles southeast of downtown Buffalo. Bliss & Laughlin Steel operated the site from 1929 to 1971, producing cold-finished steel bars for heavy equipment such as automobiles, appliances, construction machinery, and farm equipment. The plant was closed by a strike in 1971 and was sold the following year. After a number of ownership changes, as of June 2016, the plant is owned by the Niagara LaSalle Corporation (NLC, 2016).

Under contract to the National Lead Company of Ohio (Fernald), Bliss & Laughlin Steel rolled uranium rods for the Atomic Energy Commission (AEC) and also provided uranium slug-machining services. Bliss & Laughlin Steel was part of a complex called "The Buffalo Works," portions of which were operated by Bliss & Laughlin Steel, Bethlehem Steel, and American Car and Foundry, which fashioned components for the early weapons program (Battelle TBD-6000, Appendix D). Site operations evaluated in this report involved natural uranium metal owned by the AEC. Operations at Bliss & Laughlin Steel consisted of machine-turning and straightening uranium rods to improve the rod-diameter tolerance.

The facility consists of a single slab-on-grade building with a floor area of approximately 129,600 ft^2 (Radian, 1999). The uranium metal-finishing operations were conducted at a location within the building designated as the Special Finishing Area that occupies approximately 3,230 ft^2 of floor space. The floor in that area was characterized as rough surface concrete. Further description and analysis of radiological conditions during the AWE production era at Bliss & Laughlin Steel can be found in NIOSH's evaluation report for SEC-00131.

A radiological survey of the site was performed by Oak Ridge Institute for Science and Education (ORISE) in 1992 (Berger, 1992). As a result of this survey, the site was added to the Formerly Utilized Sites Remedial Action Program (FUSRAP) (Fiore, 1992).

A site characterization was performed by Bechtel National, Inc. for DOE in 1995. This survey found elevated radiation levels in the overhead areas and floor surfaces in the Special Finishing Area

(Artates, 1995). For both this survey and the one conducted by ORISE in 1992, other building areas were surveyed and found to be uncontaminated. In both surveys, spectrographic results for samples collected in the Special Finishing Area indicated the material to be natural uranium.

The site was remediated under the FUSRAP program after it was transferred from DOE to USACE in 1997. A "Scope of Work" document issued by the USACE included the following specific contamination-control requirements for the remediation project (USACE, post-Jun1998):

- "The Contractor shall work only on Sundays (22 hours work shift) and some Saturdays and holidays, if the facility owner agrees."
- "The Contractor shall enclose each work area to prevent spread of contamination to other areas of the facility."
- "The contractor shall control dust during the performance of decontamination activities by spraying water or using other methods approved by USACE."
- "The Contractor shall install air monitors for work area monitoring."
- "The Contractor shall restore the remediated areas of the building to a usable condition at the end of each working day."

Radian International, a division of Dames and Moore, was selected by USACE for the remediation work. Site decontamination began in December 1998 and all on-site work was completed by March 1999. A closure report created by Radian detailed the site activities and documented the post-remediation confirmation survey results (Radian, 1999). AWE employees at the Bliss & Laughlin Steel site did not perform remediation activities.

Radian's closure report contains details on each of the three areas in the Special Finishing Area that were decontaminated: the overhead steel trusses, the concrete floor, and trenches within the floor. There are also data for subsequently surveyed vertical steel columns located in the same area, performed to confirm that the decontamination activities did not spread contamination.

The steel trusses were scraped, wiped down with masslin, and then vacuumed with a HEPA vacuum. Any existing equipment in the affected area were covered prior to the work (Radian, 1999, PDF p. 17).

The 3,230 ft^2 concrete floor of the Special Finishing Area was surveyed and 15 areas were decontaminated by scabbling, with areas ranging from less than 11 ft^2 to greater than 43 ft^2. "For the scabbling operation, an enclosure with a HEPA filtration unit was constructed to capture dust generated from the operation. A HEPA vacuum was used to remove concrete debris and dust during and after scabbling" (Radian, 1999, PDF p. 24).

The floor in the Special Finishing Area contained several shallow utility trenches. Previous surveys had found no elevated readings in these trenches. During the remediation, two trenches that were covered with concrete were exposed and surveyed. One of these trenches extended into a pit and was found to contain metal shavings and other radioactive debris (Radian, 1999, PDF p. 18). The trench and pit were cleaned with a jackhammer-mounted scabbler, a jackhammer, and sand blasting. "All jack hammering, scabbling and sand blasting operations were conducted in an enclosure with HEPA

filtration" (Radian, 1999, PDF p. 26). A total of 60 cubic yards of contaminated material were removed and shipped for burial (Radian, 1999, PDF p. 29).

Post remediation survey data were published in the closure report for the steel trusses, trenches, and floor (Radian, 1999, PDF pp. 52-102), as well as for the vertical steel columns (Radian, 1999, PDF pp. 103-105). The data for the steel columns showed no spread of contamination. Included in the section regarding the Radiation Protection Program was the statement, "Based on the review of the air monitoring analytical data and TLD analysis, no releases or exposures were documented" (Radian, 1999, PDF p. 28).

The Buffalo District of USACE completed remediation of the Bliss & Laughlin Steel site in March 1999 (USACE, 2009).

5.2 Radiological Exposure Sources from Bliss & Laughlin Steel Operations

The following subsections provide an overview of the internal and external exposure sources for the Bliss & Laughlin Steel class under evaluation.

5.2.1 Internal Uranium Exposures from Bliss & Laughlin Steel Operations

The principal source of internal radiological exposure to workers at the Bliss & Laughlin Steel site during the residual radiation period was from inhalation of dust residues remaining from 1951-1952 AWE uranium operations. The site had machined uranium metal that had been separated from decay progeny. The remaining uranium isotopes provided a source of alpha exposure when inhaled.

Normal Bliss & Laughlin Steel worker activities during the residual radiation period may have disturbed any removable activity, raising contaminants into the air. Both removable and fixed-in-place activity was documented in the surveys conducted in 1992 and 1995. In both reports, spectrographic results of samples taken in the Finishing Area indicate uranium as the contaminant.

In the 1992 survey, the highest removable alpha activity was 430 dpm/100 cm^2. The greatest majority of 18 swipes taken in the Finishing Area were at background. "Surface activity levels, measured at all other building locations, were less than the detection limits of the procedures" (Berger, 1992, PDF pp. 14-15). Figure 5-1 shows these results, sorted from highest to lowest values.

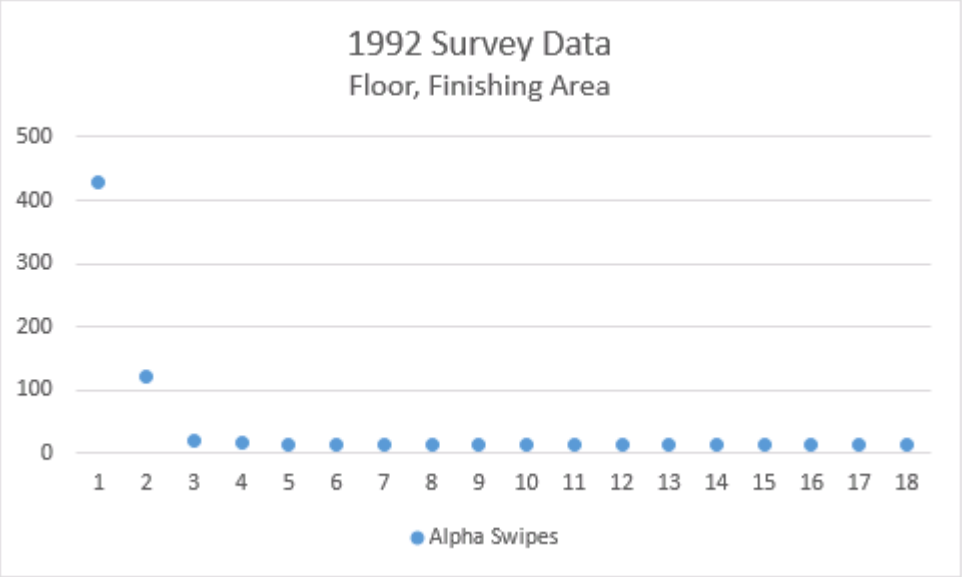

Figure 5-1: Graph of sorted results from alpha swipes taken in 1992 (Finishing Area)

In the 1995 survey, the highest value was 224 dpm/100 cm^2. Results from 39 swipes taken in the Finishing Area showed the greatest majority also to be at background (Artates, 1995, PDF pp. 22-23). Figure 5-2 shows these results, sorted from highest to lowest values.

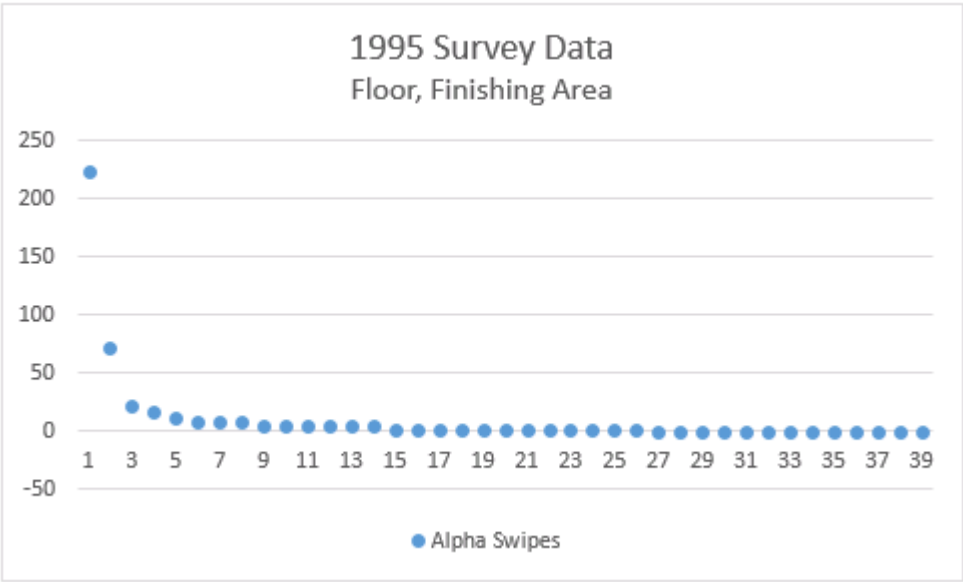

Figure 5-2: Graph of sorted results from alpha swipes taken in 1995 (Finishing Area)

5.2.2 External Uranium Exposures from Bliss & Laughlin Steel Operations

The principal source of external photon and beta exposures to workers at the site during the residual radiation period was from dust residues remaining from AWE uranium operations in 1951-1952.

Short-lived progeny and the uranium isotopes provided sources of gamma exposure and beta exposure. The presence of fixed and removable uranium metal contaminants provided additional external photon and beta exposures to workers in the immediate vicinity.

The neutron dose rate from uranium metal is a negligible fraction of the total beta/gamma dose (< 0.07%) (Battelle-TBD-6000). Neutron dose rates are not considered in the reconstruction of external doses at the Bliss & Laughlin Steel facility.

6.0 Summary of Available Monitoring Data for the Class Evaluated by NIOSH

The following subsections provide an overview of the state of the available internal and external monitoring data for the Bliss & Laughlin Steel class under evaluation.

6.1 Available Bliss & Laughlin Steel Internal Monitoring Data

NIOSH has not found any internal monitoring data for the AWE employees at the Bliss & Laughlin Steel site for the period under evaluation, calendar year 1999.

Air monitoring was required in the FUSRAP Scope of Work for the Bliss & Laughlin site decontamination efforts (USACE, post-Jun1998). The USACE closure report states that during the remediation activities between December 1998 and March 1999, a review of air monitoring data during the remediation showed "no release" (Radian, 1999, PDF p. 28).

The surveys taken in 1992 and 1995 measured removable alpha activity on surfaces. For both surveys, the only removable activity found above background was in the Special Finishing Area. The greatest number of survey locations within the Special Finish Area were at background. The locations for the results are identified in the reports (Berger, 1992, PDF p. 13; Artates, 1995, PDF pp. 4-5).

The highest removable alpha activity measured in the 1992 survey was 430 dpm/100cm^2 (Berger, 1992), with the highest in the 1995 survey being 224 dpm/100 cm^2 (Artates, 1995). The removable contamination levels for all measurements in the Special Finishing Area for each survey are presented in Figures 5-1 and 5-2 above.

The 1995 survey report indicated that "floor monitors" were used to scan for areas of elevated radiation in the Special Finishing Area and in other areas within the building. Elevated surface readings were identified in the Special Finishing Area. A six-meter wide path around each identified area received a "100% scan using a floor monitor" and at least "50% of the floors in the remainder of the building" were surveyed (Artates, 1995, PDF p. 3). Measurements in other areas of building showed no evidence of contamination and floor monitors did not show any elevated areas or hot spots (Artates, 1995, PDF p. 5).

The USACE closure report published post-remediation survey results for all areas found to be contaminated and remediated; the floor, the overhead trusses, the trenches, and the pit adjacent to one of the trenches. In the overhead trusses, 59 locations were reported with the highest removable alpha measured at 7 dpm/100 cm^2. For the trenches and the pit, 166 measurements were reported with the highest at 4 dpm/100cm^2. For the floor, 81 measurements are listed with the highest at 2 dpm/100cm^2. All measurements were taken prior to the end of March 1999.

6.2 Available Bliss & Laughlin Steel External Monitoring Data

NIOSH has not found any external monitoring data for the AWE employees at the Bliss & Laughlin Steel site for the period under evaluation, calendar year 1999.

In the 1992 survey report, a value of 9 µR/hour, measured with a pressurized ionization chamber, is stated as the external gamma background for the site. The only mention of locations that were found to exceeded this were readings taken over a slag-like material, measured at "2 to 3 times background." This material was sampled and found to be naturally occurring and unrelated to the uranium work. "No additional indoor or outdoor locations, indicating possible residual radioactive material, were identified by the gamma scans" (Berger, 1992, PDF p. 13).

The USACE closure report stated that during the remediation activities between December 1998 and March 1999, based on TLD analysis, no exposures were documented.

7.0 Feasibility of Dose Reconstruction for the Class Evaluated by NIOSH

The feasibility determination for the class of employees under evaluation in this report is governed by both EEOICPA and 42 C.F.R. § 83.13(c)(1). Under that Act and rule, NIOSH must establish whether or not it has access to sufficient information either to estimate the maximum radiation dose for every type of cancer for which radiation doses are reconstructed that could have been incurred under plausible circumstances by any member of the class, or to estimate the radiation doses to members of the class more precisely than a maximum dose estimate. If NIOSH has access to sufficient information for either case, NIOSH would then determine that it would be feasible to conduct dose reconstructions.

In determining feasibility, NIOSH begins by evaluating whether current or completed NIOSH dose reconstructions demonstrate the feasibility of estimating with sufficient accuracy the potential radiation exposures of the class. If the conclusion is one of infeasibility, NIOSH systematically evaluates the sufficiency of different types of monitoring data, process and source or source term data, which together or individually might assure that NIOSH can estimate either the maximum doses that members of the class might have incurred, or more precise quantities that reflect the variability of exposures experienced by groups or individual members of the class. This approach is discussed in NIOSH's SEC Petition Evaluation Internal Procedures which are available at http://www.cdc.gov/niosh/ocas. The next four major subsections of this evaluation report examine:

- The sufficiency and reliability of the available data. (Section 7.1)
- The feasibility of reconstructing internal radiation doses. (Section 7.2)
- The feasibility of reconstructing external radiation doses. (Section 7.3)
- The bases for petition SEC-00230 as submitted by the petitioner. (Section 7.4)

7.1 Pedigree of Bliss & Laughlin Steel Data

This subsection answers questions that need to be asked before performing a feasibility evaluation. Data Pedigree addresses the background, history, and origin of the data. It requires looking at site methodologies that may have changed over time; primary versus secondary data sources and whether they match; and whether data are internally consistent. All these issues form the bedrock of the researcher's confidence and later conclusions about the data's quality, credibility, reliability, representativeness, and sufficiency for determining the feasibility of dose reconstruction. The feasibility evaluation presupposes that data pedigree issues have been settled.

NIOSH has not found any internal or external monitoring data for AWE employees at the Bliss & Laughlin Steel site for the time between January 1, 1999 and December 31, 1999. Methods to provide a realistic and accurate upper bound estimate of internal exposure to workers when monitoring data are absent are based on documents previously developed by NIOSH for this purpose. These documents include the technical basis documents Battelle-TBD-6000 and Battelle-TBD-6000, Appendix D (specific to the Bliss & Laughlin Steel site), along with the evaluation report for SEC-00131 which examined a class that included all employees at the site between January 1, 1951 and December 31, 1998. These documents have been reviewed by the Advisory Board and its contractor. Battelle-TBD-6000, Appendix D was developed for the Bliss & Laughlin Steel site, applying the methods in Battelle-TBD-6000 with parameters specific to the site.

7.2 Evaluation of Bounding Internal Radiation Doses at Bliss & Laughlin Steel

The principal source of internal radiation doses for members of the class under evaluation was the inhalation of the uranium isotopes found in natural uranium metal, U-238, U-235, and U-234 (Battelle-TBD-6000, Appendix D). The following subsections address the ability to bound internal doses, methods for bounding doses, and the feasibility of internal dose reconstruction.

7.2.1 Evaluation of Bounding AWE-Period Process-Related Internal Doses

This report does not include an evaluation of process-related internal doses during the AWE period 1951-1952. The evaluated period of 1999 only consists of the residual radiation period. An evaluation of the process-related AWE period can be found in SEC-00131 (NIOSH, 2009).

7.2.2 Methods for Bounding Residual Radiation Period Internal Dose at Bliss & Laughlin Steel

A previous evaluation of the Bliss & Laughlin site was performed by NIOSH in response to petition SEC-00131. It examined conditions during the AWE operational period from 1951 through 1952, and the residual radiation period as defined at the time of the report, from 1953 through 1998. The definition of the residual radiation period has since been extended through the end of 1999.

The NIOSH evaluation report for SEC-00131 was presented to the Advisory Board on Radiation Worker and Health. In a March 28, 2011, letter to the Secretary of the Department of Health and Human Services, the Advisory Board concurred that NIOSH had access to adequate exposure monitoring and other information necessary to perform individual dose reconstructions with sufficient accuracy for members of the class consisting of all AWE employees at the Bliss & Laughlin Steel site between January 1, 1951 and December 31, 1998 (ABRWH, 2011).

The method used to estimate internal exposure during the residual radiation period in the SEC-00131 evaluation report is based on the combined alpha activity for all uranium isotopes present.

The internal exposure pathways during the residual radiation period were the inhalation and ingestion of uranium resulting from activities that disturbed material remaining from the production period. Battelle-TBD-6000, Appendix D contains factors specific to the Bliss & Laughlin Steel site. These were used with the methods in the evaluation report for SEC-00131 and Battelle-TBD-6000.

Table 7.5 in Battelle-TBD-6000 contains an analysis of measurements of air concentrations at contemporary uranium machining facilities for various jobs. The highest concentration listed was for the machine operators with a geometric mean value of 5480 dpm/m^3. To estimate the amount of material that may have settled to the floor from uranium metal machining during the production period, a calculation was made assuming an air concentration of 5480 dpm/m^3 existed continuously during operations in 1951 and 1952 and it deposited to the floor with a settling velocity of 7.5 E-4 m/s. This results in a surface contamination level of 6510 dpm/100 cm^2 and is used for the initial conditions prior to the residual radiation period starting on January 1, 1953. Removal of this contamination would have occurred through normal site activities such as cleaning. Using the 5480 dpm/100 cm^2 value as the estimated amount of surface contamination as of January 1, 1953, and the value of 430 dpm/100 cm^2, the highest surface contamination found in the 1992 survey, a removal factor of 0.0001888/day was calculated (Battelle-TBD-6000, Appendix D, PDF p. 4). This removal factor was applied against the initial conditions to develop surface contamination and air concentrations levels for subsequent years.

Table D-1 of Battelle-TBD-6000, Appendix D for the Bliss & Laughlin Steel site lists inhalation and ingestion values for the years between 1951 and 1998. In 1998, it shows 0.2888 dpm/calendar day inhaled and 0.006016 dpm/calendar day ingested. Details of the calculations used may be found in Battelle-TBD-6000, Appendix D (Battelle-TBD-6000, Appendix D, PDF p. 8).

The values and methods described for internal dose reconstruction were reviewed by the Advisory Board and deemed appropriate for site AWE employees immediately prior to the remediation activities (ABRWH, 2011).

7.2.3 Internal Dose Reconstruction Feasibility Conclusion

The locations and levels of contamination at the site were known from the published FUSRAP survey data presented above. NIOSH has developed methods to estimate internal dose for the residual period immediately prior to the 1999 period under evaluation. These methods, as reviewed by the Advisory Board in 2011, were determined to be: consistent with Battelle-TBD-6000 and its site-specific Appendix D; assume 100 times the MAC depositing on floor surfaces for one year with a daily site-specific removal rate of 0.0001888 for the next two years with no further reduction; and are based on site-specific FUSRAP survey data.

During the months January through March 1999, uranium contamination in the Special Finishing Area was remediated by USACE. The scope of work for the remediation included specific contamination control measures including: scheduling work to occur Sundays, some Saturdays, and on holidays; enclosures with HEPA filtration; HEPA vacuuming of areas; use of air monitors and confirmatory surveys for contamination control; removal of 60 cubic yards of contaminated material from the site; and restoration of remediated areas of the building to a usable condition for general site employees at the end of each remediation workday.

All affected areas were surveyed post-remediation and found to be at a small fraction of the contamination levels prior to the cleanup. NIOSH finds no indications of increased exposures to site AWE employees resulting from the well-controlled remediation activities performed by USACE through March 1999. Site contamination levels after the remediation were significantly reduced. NIOSH has determined that the internal dose reconstruction approaches for AWE employees through December 31, 1998 (SEC-00131) are applicable and bounding for AWE employees at the Bliss & Laughlin Steel site between January 1, 1999 and December 31, 1999. Applying a continuous inhalation rate of 0.2888 dpm/day of uranium alpha activity and ingestion of 0.006016 dpm/day of uranium alpha activity (pre-remediation levels in Battelle-TBD-6000, Appendix D) is conservative and claimant-favorable for the 1999 post-remediation period.

NIOSH finds sufficiently accurate internal dose reconstruction feasible using the methods described in the SEC-00131 evaluation report, Battelle-TBD-6000, and Battelle-TBD-6000, Appendix D. Extending the methods from SEC-00131 through December 31, 1999, is considered claimant favorable for Bliss & Laughlin Steel site AWE employees from January 1, 1999 through December 31, 1999.

7.3 Evaluation of Bounding External Radiation Doses at Bliss & Laughlin Steel

The principal source of external radiation doses for members of the evaluated class was the direct exposure to the uranium isotopes and their short-lived progeny found in natural uranium metal, U-238, U-235, U-234, Th-234, Pa-234m, Pa-234, and Th-231 (Battelle-TBD-6000, Appendix D).

The following subsections address the ability to bound external doses, methods for bounding doses, and the feasibility of external dose reconstruction for the period under evaluation.

7.3.1 Evaluation of Bounding AWE-Period Process-Related External Doses

This report does not include an evaluation of process-related external doses during the AWE period 1951-1952. The evaluated period of 1999 only consists of the residual radiation period. An evaluation of the process-related AWE period can be found in SEC-00131 (NIOSH, 2009).

7.3.2 Bliss & Laughlin Steel Occupational X-Ray Examinations

The assignment of medical X-ray dose is not required during residual radiation periods for AWE facilities (ORAUT-OTIB-0006 and ORAUT-OTIB-0079). Consequently, NIOSH concludes that it is not applicable to reconstruct occupational medical dose for Bliss & Laughlin Steel workers during the period being evaluated from January 1, 1999 through December 31, 1999.

7.3.3 Methods for Bounding Residual Radiation Period External Dose at Bliss & Laughlin Steel

Photon Dose

Battelle-TBD-6000 presents calculations that estimate the dose that may have been received at typical sites that machined uranium. Battelle-TBD-6000, Appendix D contains factors specific to Bliss & Laughlin Steel that are used with the methods described in the main document (i.e., Battelle-TBD-6000).

Battelle-TBD-6000, Appendix D describes methods to estimate external photon dose from exposures to contaminated surfaces and submersion in contaminated air. As described previously, the initial conditions are estimated by using an air concentration of 5800 dpm/m^3 and a settling velocity 7.5 E-4 m/s. The removal constant of 0.0001888/day is applied to provide conditions for later years in the residual radiation period.

For dose reconstruction, all workers at Bliss & Laughlin Steel are assumed to have worked daily in the Special Finishing Area during the residual radiation time period. Table D.3 of Battelle-TBD-6000, Appendix D, contains external dose values in mrem/year, which are applied as a lognormal distribution with a GSD of 5 (Battelle-TBD-6000, Appendix D, PDF p. 31). Penetrating radiation is assigned as photons with 76.7% in the >30 keV energy range, 10% in the 30-250 keV energy range, and 13.3% in the >250 keV energy range. For the years 1990 through 1998, the exposure estimate for photon dose is 0.07917 mrem/year.

Site contamination levels after the remediation were significantly reduced. The 0.07917 mrem/year estimate may be applied for external photon exposure for AWE employees at the Bliss & Laughlin Steel site between January 1, 1999 and December 31, 1999.

Beta Dose

Battelle-TBD-6000 includes a dose conversion factor of 3.82E-08 mRad/hour per dpm of alpha/m^2 to estimate external beta exposure from working near surface contamination consisting of natural uranium metal. The factor assumes exposure to occur one meter above an infinitely thin source of natural uranium. The uranium is aged 100 days past separation to account for ingrowth of the short-lived beta-producing progeny. The beta dose rate to the skin was determined using dose conversion factors from ICRP 74 (Battelle-TBD-6000, PDF pp. 25-26).

The methods used in Battelle-TBD-6000, Appendix D, assume that in 1998 the entire floor was contaminated at 430 dpm/100 cm^2. This was the highest removable alpha-activity result found in 1992. A conservative assumption was made that the contamination remained at this level for the period from 1992 through 1998. Note that the highest removable alpha value measured in 1995 was 224 dpm/100 cm^2.

Using the beta conversion factor from Battelle-TBD-6000 and the measured floor contamination concentration of 430 dpm/100 cm^2 results in a beta exposure of 0.001643 mRad/hour. Assuming constant exposure for the entire time for workers in the immediate vicinity and a 40-hour work week results in 0.0657 mRad per week. For any given hours-worked per week, a similar result may be calculated.

These values may be used to estimate external beta exposure for AWE employees at the Bliss & Laughlin Steel site during the period from January 1, 1999 through March 31, 1999. No beta exposure is assumed to occur after completion of the remediation.

7.3.4 External Dose Reconstruction Feasibility Conclusion

The values and methods described in Section 7.3.3 for external dose reconstruction were reviewed by the Advisory Board and deemed appropriate for site AWE employees immediately prior to the remediation activities (ABRWH, 2011). As presented in section 7.2.3 above, the locations and levels of contamination at the site were known from published FUSRAP survey data. Methods to estimate

external dose for the residual period immediately prior to the time period for the class under evaluation have been developed by NIOSH. These methods, as reviewed by the Advisory Board in 2011, were determined to be consistent with Battelle-TBD-6000 and its site-specific Appendix D.

Consistent with the internal dose reconstruction feasibility findings presented in Section 7.2.3 above, NIOSH finds no indications of increased exposures to site AWE employees resulting from the well-controlled remediation activities performed by USACE through March 1999. Site contamination levels after the remediation were significantly reduced. NIOSH has determined that the external dose reconstruction approaches for AWE employees through December 31, 1998 (SEC-00131) are applicable and bounding for AWE employees at the Bliss & Laughlin Steel site between January 1, 1999 and December 31, 1999.

NIOSH finds sufficiently accurate external dose reconstruction feasible using the methods described in the SEC-00131 evaluation report, Battelle-TBD-6000, and Battelle-TBD-6000, Appendix D. Extending the existing methods through the period from January 1, 1999 through March 31, 1999, is considered claimant favorable for Bliss & Laughlin Steel site AWE employees. No beta exposure is assumed to occur after completion of the remediation.

7.4 Evaluation of Petition Basis for SEC-00230

This subsection evaluates the assertion that workers were not monitored, made on behalf of petition SEC-00230 for Bliss and Laughlin Steel.

Issue: The petitioner stated that there was no health monitoring and provided SEC-00131 as evidence of that finding.

Response: NIOSH agrees that there were no internal or external radiological monitoring of AWE employees at the Bliss & Laughlin Steel site between January 1, 1999 and December 31, 1999. NIOSH finds, however, that there are adequate and accurate methods to provide an upper bounding estimate of possible exposures to the workers using the technical basis documents Battelle-TBD-6000 and Battelle-TBD-6000, Appendix D, as previously reviewed by the Advisory Board.

7.5 Summary of Feasibility Findings for Petition SEC-00230

This report evaluates the feasibility for completing dose reconstructions for employees at Bliss & Laughlin Steel from January 1, 1999 through December 31, 1999. Although NIOSH lacks AWE employee personnel monitoring data during the period under evaluation, NIOSH has internal and external dose reconstruction methods available that were previously reviewed and accepted by the Advisory Board. NIOSH has determined that the available area monitoring records, process descriptions, and source term data available are sufficient to complete dose reconstructions for the evaluated class of AWE employees during the period from January 1, 1999 through December 31, 1999.

Table 7-1 summarizes the results of the feasibility findings at Bliss & Laughlin Steel for each exposure source during the time period January 1, 1999 through December 31, 1999.

Table 7-1: Summary of Feasibility Findings for SEC-00230
January 1, 1999 through December 31, 1999

Source of Exposure	Reconstruction Feasible (Yes or No)
Internal	**Yes**
Natural Uranium	Yes
External	**Yes**
Photon	Yes
Beta	Yes
Neutron	N/A
Occupational Medical X-ray	N/A

As of June 9, 2016, a total of 10 claims have been submitted to NIOSH for individuals who worked at Bliss & Laughlin Steel during the period under evaluation in this report. Dose reconstructions have been completed for 9 of those claims (90%).

8.0 Evaluation of Health Endangerment for Petition SEC-00230

The health endangerment determination for the class of employees covered by this evaluation report is governed by both EEOICPA and 42 C.F.R. § 83.13(c)(3). Under these requirements, if it is not feasible to estimate with sufficient accuracy radiation doses for members of the class, NIOSH must also determine that there is a reasonable likelihood that such radiation doses may have endangered the health of members of the class. Section 83.13 requires NIOSH to assume that any duration of unprotected exposure may have endangered the health of members of a class when it has been established that the class may have been exposed to radiation during a discrete incident likely to have involved levels of exposure similarly high to those occurring during nuclear criticality incidents. If the occurrence of such an exceptionally high-level exposure has not been established, then NIOSH is required to specify that health was endangered for those workers who were employed for a number of work days aggregating at least 250 work days within the parameters established for the class or in combination with work days within the parameters established for one or more other classes of employees in the SEC.

NIOSH has internal and external dose reconstruction methods available that were previously reviewed and accepted by the Advisory Board. NIOSH's evaluation determined that it is feasible to estimate radiation dose for members of the NIOSH-evaluated class with sufficient accuracy based on the sum of information available from available resources. Therefore, a health endangerment determination is not required.

9.0 Class Conclusion for Petition SEC-00230

NIOSH found no part of said class for which it cannot estimate radiation doses with sufficient accuracy. This class includes all atomic weapons employees who worked in any area at the Bliss & Laughlin Steel site in Buffalo, New York, during the period from January 1, 1999 through December 31, 1999.

NIOSH has carefully reviewed all material sent in by the petitioner, including the specific assertions stated in the petition, and has responded herein. NIOSH has also reviewed available technical resources and many other references, including the SRDB, for information relevant to SEC-00230. In addition, NIOSH reviewed its NOCTS dose reconstruction database to identify EEOICPA-related dose reconstructions that might provide information relevant to the petition evaluation.

These actions are based on existing, approved NIOSH processes used in dose reconstruction for claims under EEOICPA. NIOSH's guiding principle in conducting these dose reconstructions is to ensure that the assumptions used are fair, consistent, and well-grounded in the best available science. Simultaneously, uncertainties in the science and data must be handled to the advantage, rather than to the detriment, of the petitioners. When adequate personal dose monitoring information is not available, or is very limited, NIOSH may use the highest reasonably possible radiation dose, based on reliable science, documented experience, and relevant data to determine the feasibility of reconstructing the dose of an SEC petition class. NIOSH contends that it has complied with these standards of performance in determining the feasibility or infeasibility of reconstructing dose for the class under evaluation.

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10.0 References

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42 C.F.R. pt. 83, *Procedures for Designating Classes of Employees as Members of the Special Exposure Cohort Under the Energy Employees Occupational Illness Compensation Program Act of 2000*; Final Rule; May 28, 2004; SRDB Ref ID: 22001

ABRWH, 2011, *Dose Reconstruction Feasible for Petition 00131, Bliss & Laughlin Steel, Buffalo, New York, During the period from January 1, 1953 through December 31, 1998*, correspondence to Department of Health and Human Services; Advisory Board on Radiation and Worker Health (ABRWH); March 28, 2011; SRDB Ref ID: 156714

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Battelle-TBD-6000, *Site Profiles for Atomic Weapons Employers that Worked Uranium Metals*, Rev. 1; Division of Compensation Analysis and Support; effective June 17, 2011; SRDB Ref ID: 101251

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Radian, 1999, *Closure Report, Decontamination of the Former Bliss and Laughlin Facility, Buffalo, New York*, prepared for the United States Army Corps of Engineers, Buffalo District; Radian International; September 30, 1999; SRDB Ref ID: 59199

USACE, post-Jun1998, *Scope of Work for Remediation of Bliss and Laughlin Steel Company Site, Buffalo, New York*; US Army Corps of Engineers (USACE); created sometime after June 5, 1998; SRDB Ref ID: 63433

USACE, 2009, *Bliss & Laughlin Steel Site Status*, select pages from website; US Army Corps of Engineers (USACE) Buffalo District; printed January 30, 2009; SRDB Ref ID: 59198

Attachment One: Data Capture Synopsis

Table A1-1: Summary of Holdings in the SRDB for Bliss & Laughlin Steel

Data Capture Information	Data Capture Description	Date Completed	No. Uploaded into SRDB
"Primary Site/Company Name: Bliss & Laughlin Steel AWE 1951-1952; Residual Radiation 1953-1999 Other Company Names: B & L Steel 1952-1971; Ramco-Fitzsimmons 1972-1985; Niagara Cold Drawn 1986-1992; Niagara LaSalle 1992 - present Physical Size of the Site and Population: Facility size is a 129,167 square foot building surrounded by 161,458 square feet of grounds. Covered work was performed in a 3,230 square foot section of the building. As of May 2015, 49 workers were employed at the Buffalo location."	[Name Redacted] of Niagara LaSalle confirmed that no Bliss & Laughlin records from the National Lead Company of Ohio (NLO) uranium machining experiment are held at either the Buffalo Site or the New York Corporate Offices of Niagara Corporation.	03/05/2009	0
State Contacted: [Name Redacted], New York State Department of Environmental Conservation (NYSDEC)	NYSDEC records and New York State Archives were searched, no relevant documents were found.	03/12/2009	0
Department of Labor / Paragon CD	A memo requesting authorization to ship drums of dry uranium oxide from Bliss & Laughlin to Mallinckrodt and a resurvey recommendation for Lake Ontario Ordnance Works (LOOW).	12/30/2008	2
DOE Germantown	A beryllium toxicity report and a reference to Bliss & Laughlin as a provider of uranium machining services.	09/11/2002	2
DOE Legacy Management - Grand Junction Office	FUSRAP documents and surveys, interior and exterior radiological surveys, an aerial survey, characterization and hazard categorization, and Tonawanda Area monthly progress reports.	05/07/2010	34
DOE Legacy Management - Grand Junction Office / New York State Archives	A 1951 shipment of uranium oxide.	01/30/2009	1
DOE Legacy Management - Morgantown	A listing and description of vendors which provided products or services to Fernald.	12/01/2011	1
DOE Legacy Management - MoundView (Fernald Holdings, includes Fernald Legal Database)	NLO weekly and monthly reports, air samples from rod turning operations, a memo with measures to reduce air dust at the rod turning operation, and a LOOW progress report mentioning delivery of stencils to Bliss & Laughlin.	03/06/2009	6

Data Capture Information	Data Capture Description	Date Completed	No. Uploaded into SRDB
Federal Records Center (FRC) - Kansas City (Lenexa)	FUSRAP surveys, sample logs, characterization results, radiological dose and safety assessments, and a fact sheet.	03/25/2009	13
Indiana Department of Homeland Security	Information pertaining to FUSRAP sites.	07/05/2012	1
Internet - Comprehensive Epidemiologic Data Resource (CEDR)	No relevant documents identified.	10/11/2013	0
Internet - Defense Technical Information Center (DTIC)	No relevant documents identified.	10/15/2013	0
Internet - DOE Legacy Management	Fact sheets and the Bliss & Laughlin Remedial Investigation/Feasibility Study.	03/30/2016	3
Internet - DOE Legacy Management Considered Sites	New York Operations Office monthly report, a fact sheet, FUSRAP documents, an aerial photograph, the Bliss & Laughlin Record of Decision, long-term surveillance and maintenance, and the Post-Remedial Radiological Dose and Risk Assessment .	10/11/2013	25
Internet - DOE Legacy Management Considered Sites/Internet - NRC Agency wide Document Access and Management (ADAMS)	Guidance for implementing long-term surveillance.	04/17/2012	1
Internet - DOE OpenNet	Linking Legacies Appendix B identifies Bliss & Laughlin as a uranium machining operator.	12/31/2007	1
Internet - DOE OSTI Energy Citations	An overview of U.S. decommissioning experience.	04/08/2009	1
Internet - DOE OSTI Information Bridge	The DOE programmatic environmental impact statement for environmental restoration and waste management.	06/22/2007	1
Internet - DOE OSTI SciTech Connect	Site summaries from the DOE long-term stewardship report to Congress.	10/29/2015	1
Internet - Energy Employees Claimant Assistance Project (EECAP)	No relevant documents identified.	10/11/2013	0
Internet - EPA NEPIS	No relevant documents identified.	10/11/2013	0
Internet - Google	Nuclear News Weapons Program remediation and compensation articles, US Army Corps of Engineers closure reports, record of decision and RI/FS news releases, a Brookings Institution report identifying Bliss & Laughlin as an NLO subcontractor, a listing of contaminated Buffalo, NY sites, FUSRAP documents, news releases, DOE Legacy Management site overview, and a Bechtel status report.	03/13/2013	32
Internet - Hanford Declassified Document Retrieval System (DDRS)	No relevant documents identified.	03/22/2009	0

Data Capture Information	Data Capture Description	Date Completed	No. Uploaded into SRDB
Internet - Health Physics Journal	No relevant documents identified.	10/11/2013	0
Internet - International Journal of Occupational and Environmental Health	No relevant documents identified.	10/11/2013	0
Internet - National Academies Press (NAP)	No relevant documents identified.	10/11/2013	0
Internet - National Nuclear Security Administration (NNSA) - Nevada Site Office	No relevant documents identified.	10/11/2013	0
Internet - NIOSH	Reports on residual radioactive and beryllium contamination.	08/31/2011	4
Internet - NRC Agency-wide Document Access and Management (ADAMS)	Long-term surveillance and maintenance program report, staff evaluations of sites identified in a USA Today article, a 2008 status of decommissioning report, and a FUSRAP management requirements and policies manual.	12/02/2014	7
Internet - U.S. Army Corps of Engineers (USAC) Buffalo District	No relevant documents identified.	10/11/2013	0
Internet - U.S. Transuranium & Uranium Registries	No relevant documents identified.	10/11/2013	0
National Institute for Occupational Safety and Health (NIOSH)	Preparation for worker outreach in response to the 2009 filing of the Bliss & Laughlin SEC petition.	10/02/2009	1
New York State Archives	1952 and 1953 AEC Tonawanda Sub-Office weekly and monthly reports.	03/19/2012	1
Oak Ridge Associated Universities (ORAU) Team	Analysis of Bliss & Laughlin air sample data, documented communications, a Project spreadsheet, and Project documents pertaining to Bliss & Laughlin dose reconstructions.	03/13/2014	11
Unknown	FUSRAP documents and surveys, Madison Square Office uranium inventories, dust hazards, and New York Operations Office reports.	07/11/2003	13
U.S. Army Corps of Engineers (USACE) Buffalo District	A 1998 list of SAIC tasks for the Buffalo District Office. NOTE - A search for the Bliss & Laughlin remediation contract along with related Health and Safety Program documents have been requested.	OPEN	1
TOTAL	N/A	N/A	163

Table A1-2: Database Searches for Bliss & Laughlin Steel

Database/Source	Keywords	Hits	Uploaded into SRDB
Defense Technical Information Center (DTIC) COMPLETED 10/15/2013	Database search terms and Internet address are available in the Excel file called "Copy of Bliss Laughlin Steel Rev 01 (83 13) 06-03-16."	27	0
DOE CEDR COMPLETED 10/11/2013	Database search terms and Internet address are available in the Excel file called "Copy of Bliss Laughlin Steel Rev 01 (83 13) 06-03-16."	0	0
DOE Hanford DDRS COMPLETED 03/22/2009	Database search terms and Internet address are available in the Excel file called "Copy of Bliss Laughlin Steel Rev 01 (83 13) 06-03-16."	2	0
DOE Legacy Management Considered Sites COMPLETED 10/11/2013	Database search terms and Internet address are available in the Excel file called "Copy of Bliss Laughlin Steel Rev 01 (83 13) 06-03-16."	21	1
DOE NNSA - Nevada Site Office COMPLETED 10/11/2013	Database search terms and Internet address are available in the Excel file called "Copy of Bliss Laughlin Steel Rev 01 (83 13) 06-03-16."	386	0
DOE OpenNet COMPLETED 10/11/2013	Database search terms and Internet address are available in the Excel file called "Copy of Bliss Laughlin Steel Rev 01 (83 13) 06-03-16."	417	1
DOE OSTI Energy Citations COMPLETED 03/22/2009	Database search terms and Internet address are available in the Excel file called "Copy of Bliss Laughlin Steel Rev 01 (83 13) 06-03-16."	2,818	0
DOE OSTI Information Bridge COMPLETED 03/22/2009	Database search terms and Internet address are available in the Excel file called "Copy of Bliss Laughlin Steel Rev 01 (83 13) 06-03-16."	1,790	0
DOE OSTI SciTech Connect COMPLETED 10/11/2013	Database search terms and Internet address are available in the Excel file called "Copy of Bliss Laughlin Steel Rev 01 (83 13) 06-03-16."	3	0
Energy Employees Claimant Assistance Project (EECAP) COMPLETED 10/11/2013	Database search terms and Internet address are available in the Excel file called "Copy of Bliss Laughlin Steel Rev 01 (83 13) 06-03-16."	0	0
Google COMPLETED 10/15/2013	Database search terms and Internet address are available in the Excel file called "Copy of Bliss Laughlin Steel Rev 01 (83 13) 06-03-16."	104,419	13
Health Physics Journal COMPLETED 10/11/2013	Database search terms and Internet address are available in the Excel file called "Copy of Bliss Laughlin Steel Rev 01 (83 13) 06-03-16."	0	0
Journal of Occupational and Environmental Health COMPLETED 10/11/2013	Database search terms and Internet address are available in the Excel file called "Copy of Bliss Laughlin Steel Rev 01 (83 13) 06-03-16."	0	0

Database/Source	Keywords	Hits	Uploaded into SRDB
National Academies Press COMPLETED 10/11/2013	Database search terms and Internet address are available in the Excel file called "Copy of Bliss Laughlin Steel Rev 01 (83 13) 06-03-16."	806	0
NEPIS COMPLETED 10/11/2013	Database search terms and Internet address are available in the Excel file called "Copy of Bliss Laughlin Steel Rev 01 (83 13) 06-03-16."	0	0
NRC ADAMS Reading Room COMPLETED 10/11/2013	Database search terms and Internet address are available in the Excel file called "Copy of Bliss Laughlin Steel Rev 01 (83 13) 06-03-16."	1,580	2
United States Army Corps of Engineers (USACE) COMPLETED 10/11/2013	Database search terms and Internet address are available in the Excel file called "Copy of Bliss Laughlin Steel Rev 01 (83 13) 06-03-16."	3	0
U.S. Transuranium & Uranium Registries COMPLETED 10/11/2013	Database search terms and Internet address are available in the Excel file called "Copy of Bliss Laughlin Steel Rev 01 (83 13) 06-03-16."	0	0