

SEC Petition Evaluation Report

Petition SEC-00188, Addendum (1995–1996)

Report Rev Number:	Addendum (1995–1996)
Report Submittal Date:	July 26, 2018
Subject Expert(s):	Tim Adler, Jim Bogard, Joe Guido
Site Expert(s):	Not Applicable

Petition Administrative Summary

Petition Under Evaluation

Petition Number:	SEC-00188 Addendum (1995–1996)
Petition Type:	83.13
Petition Receipt Date:	July 18, 2011
Qualification Date:	October 21, 2011
DOE/AWE Facility Name:	Sandia National Laboratories

Petition Class

Class Evaluated by NIOSH:	All personnel that worked in any area at Sandia National Laboratories in Albuquerque, New Mexico, for the period from January 1, 1995 through May 21, 2011.
NIOSH-Proposed Class(es) to be Added to the SEC:	All employees of the Department of Energy, its predecessor agencies, and its contractors and subcontractors who worked in any area at Sandia National Laboratories in Albuquerque, New Mexico, from January 1, 1995 through December 31, 1996, 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.

Related Petition Summary Information

SEC Petition Tracking Number(s):	SEC-00162 and SEC-00188
Petition Type(s):	83.13
DOE/AWE Facility Name:	Sandia National Laboratories
Petition Status:	SEC-00162: Class added to the SEC for January 1, 1949–December 31, 1962 SEC-00188: Class added to the SEC for January 1, 1963–December 31, 1994

Related Evaluation Report Information

Report Title:	SEC Petition Evaluation Report Petition SEC-00162 SEC Petition Evaluation Report Petition SEC-00188
DOE/AWE Facility Name:	Sandia National Laboratories

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Addendum (1995–1996) to Sandia National Laboratories-Albuquerque (SEC-00188) Special Exposure Cohort Evaluation Report

Purpose and Scope of this Addendum (1995–1996)

This Addendum provides available results from continued site and program assessments at Sandia National Laboratories in Albuquerque, New Mexico (referred to as SNL-A throughout this report) that were previously unevaluated in the “SEC Petition Evaluation Report” for petition SEC-00188 (NIOSH, 2012). In that report, NIOSH defined a single class of employees for which NIOSH cannot estimate radiation doses with sufficient accuracy. The previously-identified class includes all employees of the Department of Energy, its predecessor agencies, and their contractors and subcontractors who worked at Sandia National Laboratories in Albuquerque, New Mexico, from January 1, 1963 through December 31, 1994. Also in that report, NIOSH concluded that it is feasible to reconstruct or bound external doses for all members of the NIOSH-proposed class for the entire SEC-00188 evaluation period (i.e., January 1, 1963 through May 21, 2011).

In the SEC-00188 Evaluation Report, NIOSH established December 31, 1994 as the SEC class end date on several bases. NIOSH made the determination after considering data retrieval problems known to exist into the very early 1990s, limited internal monitoring results and program documentation availability, the existence of a relatively undeveloped internal monitoring record database during that period, and the use of Controls for Environmental Pollution (CEP) analytical services for bioassay well into 1994. For timeliness, and because of the known information sufficiency problems occurring well into 1994, NIOSH issued the SEC-00188 Evaluation Report recommending a class from January 1, 1963 through December 31, 1994, based on a presumption that additional internal monitoring documentation and an improved internal monitoring record database would become available to evaluate dose reconstruction feasibility for the remaining period qualified by the SEC-00188 petition.

This Addendum presents available conclusions from NIOSH’s continued evaluation of SNL-A internal dose reconstruction feasibility for the remaining SEC-00188 petitioner-requested timeframe (January 1, 1995 through May 21, 2011). The feasibility recommendations presented in this Addendum are for the January 1, 1995 through December 31, 1996 timeframe. Although NIOSH has performed an extensive evaluation of the entire remaining 1995–2011 petitioner-requested timeframe, recently identified issues in SNL-A’s monitoring records database, known as “WebDose,” prevent NIOSH from presenting internal monitoring discussions and feasibility conclusions for the January 1, 1997 through May 21, 2011 period within this Addendum. NIOSH is analyzing an updated version of WebDose that was delivered in May 2018. The 1997–2011 data analysis is ongoing and necessary to accurately assess and present monitoring data availability and sufficiency for the remaining time period. Therefore, the remaining SEC evaluation results for January 1, 1997 through May 21, 2011, will be presented in a separate report once NIOSH completes its WebDose analysis.

Evaluation Report Summary: SEC-00188 Addendum (1995–1996)

Class Evaluated by NIOSH (in this Addendum)

All personnel that worked in any area at Sandia National Laboratories in Albuquerque, New Mexico, for the period from January 1, 1995 through May 21, 2011.

Please note that, while NIOSH did evaluate the period from January 1, 1995 through May 21, 2011, this Addendum focuses on results for January 1, 1995 through December 31, 1996. NIOSH's findings for January 1, 1997 through May 21, 2011, will be presented in a separate report after NIOSH completes its analysis of the updated WebDose database.

NIOSH Determination about the Proposed Class to be Added to the SEC (in this Addendum)

NIOSH has defined a single class of employees for which NIOSH cannot estimate radiation doses with sufficient accuracy. The NIOSH-proposed class includes all employees of the Department of Energy, its predecessor agencies, and its contractors and subcontractors who worked in any area at Sandia National Laboratories in Albuquerque, New Mexico, from January 1, 1995 through December 31, 1996, 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.

The period from January 1, 1995 through December 31, 1996, was added to the recommended SEC class because of concerns with air monitoring data availability and uncertainties associated with the transitional and developmental nature of SNL-A's internal monitoring program.

Feasibility of Dose Reconstruction

Per EEOICPA and 42 C.F.R. § 83.13(c) (1), NIOSH has established that it does not have 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 the maximum dose. Information available from the site profile and additional resources is not sufficient to estimate the maximum internal potential exposure to members of the class for the January 1995 through December 1996 period under plausible circumstances.

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

- As previously identified in the SEC-00188 Evaluation Report, NIOSH finds that it is feasible to reconstruct occupational medical dose for Sandia National Laboratories employees with sufficient accuracy.
- As previously identified in the SEC-00188 Evaluation Report, principal sources of internal radiation for members of the proposed class included exposures to plutonium, tritium, uranium, americium, and fission and activation products. Potential exposure pathways could have involved contact with radionuclides during waste-handling operations or exposure to surface or air contamination associated with reactors and/or accelerators work. NIOSH has found that source terms and associated exposures varied over the evaluated period. Considering the potential

exposure scenarios, as well as concerns with air monitoring data availability and uncertainties associated with the transitional and developmental nature of SNL-A's internal monitoring program, NIOSH finds it is unable to estimate these internal exposures with sufficient accuracy for the period from January 1, 1995 through December 31, 1996.

- As previously identified in the SEC-00188 Evaluation Report, principal sources of external radiation for members of the proposed class included exposures to alpha, beta, gamma, and neutron radiation. NIOSH finds that it is feasible to reconstruct all occupational external dose for Sandia National Laboratories-Albuquerque workers with sufficient accuracy for the entire evaluated period.
- Pursuant to 42 C.F.R. § 83.13(c) (1), NIOSH determined that there is insufficient information to either: (1) 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 (2) estimate the radiation doses of members of the class more precisely than a maximum dose estimate.
- Although NIOSH found it is not possible to completely reconstruct radiation doses for the proposed class, NIOSH intends to use any internal and external monitoring data that may become available for an individual claim (and that can be interpreted using existing NIOSH dose reconstruction processes or procedures). Therefore, dose reconstructions for individuals employed at Sandia National Laboratories from January 1, 1995 through December 31, 1996, but who do not qualify for inclusion in the SEC, may be performed using these data as appropriate.

Health Endangerment Determination

Per EEOICPA and 42 CFR §83.13(c) (3), a health endangerment determination is required because NIOSH has determined that it does not have sufficient information to estimate dose for the members of the proposed class from January 1, 1995 through December 31, 1996.

NIOSH did not identify any evidence supplied by the petitioners or from other resources that would establish that the proposed class was exposed to radiation during a discrete incident likely to have involved exceptionally high-level exposures. However, data availability issues and uncertainties associated with the site's developing internal monitoring program during this period preclude assurance that workers in the proposed class could not have possibly accumulated chronic exposures through episodic intakes of radionuclides, combined with external exposures to gamma, beta, and neutron radiation. Consequently, NIOSH has determined that health was endangered for those workers covered by this evaluation who were employed for at least 250 aggregated work days either solely under their employment or in combination with work days within the parameters established for other SEC classes.

Once NIOSH has completed its analysis of recently acquired data, NIOSH will make a health endangerment determination for the period from January 1, 1997 through May 21, 2011.

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Revised Excerpts of the SEC Petition Evaluation Report for SEC-00188

NOTE: FROM THIS POINT FORWARD, THIS SEC-00188 ADDENDUM ONLY ADDRESSES THOSE SECTIONS IN THE SEC-00188 SANDIA NATIONAL LABORATORIES SEC PETITION EVALUATION REPORT THAT REQUIRE DISCUSSION REGARDING THE 1995–1996 PERIOD. THEREFORE, THE SECTION NUMBERING IS NOT CONTIGUOUS. WHEN DEEMED HELPFUL TO THE READER, ADDITIONAL ER TEXT IS SOMETIMES INCLUDED FOR CONTEXT.

3.2 Class Evaluated by NIOSH

Although NIOSH has performed an extensive evaluation of the entire remaining January 1, 1995–May 21, 2011 petitioner-requested timeframe, recently identified issues in SNL-A’s monitoring records database, known as “WebDose,” prevent NIOSH from presenting feasibility conclusions for the period from January 1, 1997 through May 21, 2011, within this Addendum. NIOSH is analyzing an updated version of WebDose that was delivered in May 2018. NIOSH’s analysis is ongoing and necessary to accurately assess and present internal monitoring data availability and sufficiency for the remaining time period. Therefore, the remaining SEC evaluation results for January 1, 1997 through May 21, 2011, will be presented in a separate report once NIOSH completes its WebDose analysis.

This Addendum presents available conclusions from NIOSH’s continued evaluation of SNL-A internal dose reconstruction feasibility for the remaining SEC-00188 petitioner-requested timeframe (January 1, 1995 through May 21, 2011). NIOSH’s feasibility recommendations presented in this Addendum are for the January 1, 1995 through December 31, 1996 timeframe.

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

NIOSH has defined a single class of employees for which NIOSH cannot estimate radiation doses with sufficient accuracy. The NIOSH-proposed class to be added to the SEC includes all employees of the Department of Energy, its predecessor agencies, and its contractors and subcontractors who worked in any area at Sandia National Laboratories in Albuquerque, New Mexico, from January 1, 1995 through December 31, 1996, 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.

4.0 Data Sources Reviewed by NIOSH to Evaluate the Class

As is standard practice, NIOSH completed extensive database and Internet searches for information regarding SNL-A. The database searches included the DOE Legacy Management Considered Sites database, the DOE Office of Scientific and Technical Information (OSTI) SciTech Connect database, the Defense Technical Information Center, and the Hanford Declassified Document Retrieval System. In addition to general Internet searches, the NIOSH Internet search included OSTI OpenNet Advanced searches, Nuclear Regulatory Commission (NRC) Agency-wide Documents Access and Management (ADAMS) web searches, and a DOE-National Nuclear Security Administration-Nevada Site Office-search. Attachment One includes a summary of SNL-A documents. The summary includes 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 other data sources to determine information relevant to determining the feasibility of dose

reconstruction for the class of employees under evaluation. This focused primarily on determining the availability of information on personal monitoring, area monitoring, industrial processes, and radiation source materials.

4.3 Facility Employees and Experts

Twenty interviews were conducted with sixteen SNL personnel specifically to support the post-1994 Addendum evaluation work (some personnel were interviewed more than once). Workers interviewed included health physics/radiation protection staff members, a Radiation Program manager, internal dosimetry department managers, security officers, an industrial hygienist, a database manager, and a researcher (Documented Communications, 2013a–b, 2014a–m, 2017a–d, 2018).

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 period from January 1, 1995 through December 31, 1996. Table 4-1 summarizes the results of this review. (NOCTS data available as of July 25, 2018.)

Table 4-1: No. of SNL-A Claims Submitted Under the Dose Reconstruction Rule

Description	Totals
Total number of claims submitted for dose reconstruction	722
Total number of claims submitted for energy employees who worked during the period under evaluation (January 1, 1995 through December 31, 1996)	243
Total number of claims submitted for energy employees who started their employment during the period under evaluation (January 1, 1995 through December 31, 1996)	22
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).	198
Number of claims for which internal dosimetry records were obtained for the time period in the evaluated class definition	5
Number of claims for which external dosimetry records were obtained for the time period in the evaluated class definition	95

NIOSH reviewed each claim that fell within the time period under evaluation to determine whether internal and/or external personal monitoring records could be obtained for the employee. As indicated in Table 4-1, of the total number of claims submitted for energy employees who worked within the period from January 1, 1995 through December 31, 1996, 5 (2%) contain internal monitoring data and 95 (39%) contain external monitoring data.

4.5 NIOSH Site Research Database

NIOSH also examined its Site Research Database (SRDB) to locate documents captured from the site supporting the assessment of the evaluated class. Over 5,400 documents in this database are identified as pertaining to Sandia National Laboratories in Albuquerque, New Mexico. Since the last SEC designation, more than 800 documents have been included in the SRDB; these documents were reviewed and evaluated for their relevance to this Addendum.

The focus of the post-1994 data capture efforts for SNL-A includes the following:

- Internal SNL-A dosimetry program and monitoring procedures;
- Facilities and process information;
- Incident reports;
- 10 C.F.R. pt. 835 compliance and self-assessment reports/memos;
- Internally and externally-conducted Radiation Program audits and assessments;
- Air monitoring records (breathing zone and general area);
- Internal and external monitoring records;
- Radiation Worker Permits (RWPs) and Radiation Work Orders (RWOs); and
- Specific word/radionuclide information searches.

4.6 Other Technical Sources

NIOSH also investigated the following databases in an effort to assess available internal monitoring data:

- Extracts from SNL-A's "WebDose" database which the site uses for bioassay monitoring record retention and as a reporting tool;
- SNL-A databases and reports containing breathing zone and Derived Air Concentration (DAC)-hour tracking results;
- The DOE Nonconformance Tracking System (NTS): This database was reviewed for 10 C.F.R. pt. 835 violations, site responses, and corrective actions. Out of a total of 171 documents listed, 72 were deemed potentially relevant, captured in full, and loaded into the SRDB for review; and
- The DOE Occurrence Reporting System (ORPS): This database was also reviewed for 10 C.F.R. pt. 835 violations, site responses, and corrective actions. Out of a total of 1,498 documents listed, 194 were deemed potentially relevant, captured in full, and loaded into the SRDB for review.

6.1 Available Sandia National Laboratories Internal Monitoring Data

Occupational internal monitoring data available for the 1995–1996 period include *in vitro* and *in vivo* bioassay data, general area (GA) air sample data, and personal air sample (PAS) data. Samples labeled "breathing zone" (BZ) and "lapel" (both equivalent to PAS data) have also been captured.

The available air monitoring data captured for the 1995–1996 period is limited to hard copy PAS and GA data retrieved from SNL-A long-term storage repositories during site visits and from formal data capture requests. No air monitoring data of either type are stored in SNL-A's WebDose database. For this period, NIOSH has captured 104 personal air sample monitoring records for 22 individuals. NIOSH has additionally captured 37 GA sample records (monitoring data sheets).

Available 1995–1996 bioassay monitoring data are maintained within the WebDose database. Bioassay data for this period were reportedly hand-entered from hard copies. As mentioned earlier in this report, issues identified within this database have resulted in recent delivery of a replacement, updated WebDose extract for NIOSH's review. Analysis of the updated SNL-A WebDose database

delivered to NIOSH in May 2018 is ongoing and necessary to accurately assess monitoring data availability.

7.1.1 Internal Monitoring Data Pedigree Review

Data Pedigree addresses the background, history, and origin of the available monitoring 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 dose reconstruction feasibility.

Information sources relative to the 1995–1996 period depict an Internal Dosimetry program undergoing continuing development. Though internal monitoring had been performed on an ad hoc basis at SNL-A for decades prior, formalization of an Internal Dosimetry program did not begin until 1993. This is likely due in large part to the generally low internal exposure potential of the work performed at SNL-A. The first documented "Interim Internal Dosimetry Policy" was established in December 1993 (Stanley, 1993), following deficiencies noted during internal SNL-A and DOE Tiger Team assessments. During the 1995–1996 period, SNL-A's Internal Dosimetry program was still working to meet development and evolutionary requirements. This work included: monitoring approach changes; procedure development; and data collection, review, and retention formalization.

Available documentation and interviews indicate that during the 1995–1996 period, SNL-A's Internal Dosimetry program still primarily relied upon bioassay sampling for worker dose determinations (as done in earlier years). Though documented to a lesser extent, it is also apparent that work environments were also being assessed via air monitoring, with results supporting subsequent bioassay sampling requirement needs and/or changes. During most of the 1995–1996 period, procedural requirements for air sampling records review and retention appear to have been minimal (as evidenced by data capture findings). Captured field air-monitoring records show PAS results and DAC-hour calculations for individual workers and events; however, the first procedure requiring routing PAS and DAC-hour results to Internal Dosimetry for review was not issued until June 1996 (SNL, 1996). Records demonstrating individual DAC-hour tracking and accrual are not available for 1995–1996 at all and were not procedurally required until 1997 (SNL, 1997, PDF p. 228). Evidence of a DAC-hour tracking database does not exist until 1997. Though some air monitoring data from 1997 and later were stored in various electronic formats, all air data prior to this time exists only in original hard copy form stored and retrieved from inactive (long-term) record holdings. As such, these earlier records are considered primary records and therefore considered to have sufficient data pedigree from that perspective. However, the lack of required records retention and review procedures coupled with issues identifying and retrieving records from long-term storage makes determining the total PAS and DAC-hour data quantity and completeness logistically infeasible.

Documented program assessments, internal memos, and NIOSH-conducted interviews with SNL-A employees knowledgeable of 1995–1996 processes revealed additional characteristics indicative of an internal monitoring program undergoing continuous (and rapid) development. Observations and criticisms noted in these assessments, memos, and interviews included: insufficient staffing levels to meet current program developmental tasks; lack of a fully functional internal monitoring database for efficient and reliable record entry, retention, and retrieval; under-developed procedures; and underuse of air monitoring for the evaluation and control of work environments. Though 1995–1996, bioassay analytical results are now stored within the WebDose database; an interviewee indicated (Documented

Communications, 2017c) that the data were predominantly hand entered (rather than electronic input) and the quality control for the hand-entry process is now unknown.

During the course of evaluating the entire remaining petitioned evaluation period (January 1, 1995–May 21, 2011), NIOSH performed an additional data pedigree-related assessment. Though limited by sample size, the assessment indicates pertinent data pedigree information applicable to the 1995–1996 period. The assessment focused on evaluating SNL-A’s PAS monitoring record retention and retrieval abilities. Air monitoring records for 23 individuals representing monitoring conducted over the 1995–2011 evaluation period were selected from various captured sources (raw data sheets, post-1996 DAC-hour tracking reports, area-specific spreadsheets, etc.). Record retention and retrieval practices for the SNL-A PAS monitoring program were recorded temporally and by record-source type. The 23 names were then provided to SNL-A with a request to provide all dosimetry records available using the site’s currently established reasonable search protocol for EEOICPA claims. The records received from Sandia were compared to the original PAS monitoring records captured by NIOSH to determine if returned information was both consistent and indicative of the PAS monitoring indicated in the NIOSH-captured air monitoring records.

Three of the 23 individuals chosen had captured records within the 1995–1996 time frame. Of these three, no search acknowledgement or records of any type were returned for one individual, indicating a possible inadvertent omission from NIOSH’s request. Acknowledgement of records searches for the remaining two individuals was supplied; however, data previously captured by NIOSH for these two individuals were not retrieved/supplied by the site in response to this request.

7.2 Evaluation of Bounding Internal Radiation Doses at Sandia National Laboratories

As mentioned previously, only very limited air monitoring data have been captured for the 1995–1996 timeframe. The air monitoring data are judged insufficient due to a lack of required, record retention and review procedures, and due to logistical issues with identifying and retrieving records from long-term storage. Though bioassay data are available to a much greater extent via the WebDose database, data pedigree shortcomings also remain with these data with regards to unknown QC protocols used during the original hand entry of the data and the implementation of follow-up sampling. As such, additional evaluation and discussion of available data types and their subsequent incorporation into methods used to bound process-related internal doses for the 1995–1996 period are not warranted.

7.2.4 Internal Dose Reconstruction Feasibility Conclusion

NIOSH has determined that workplace monitoring data and documentation are insufficient to support bounding EEOICPA internal doses for the January 1, 1995 through December 31, 1996, portion of the evaluated class.

Although NIOSH found that it is not possible to reconstruct internal radiation doses for the period from January 1, 1995 to December 31, 1996, NIOSH intends to use any internal monitoring data that may become available for an individual claim (and that can be interpreted using existing NIOSH dose reconstruction processes or procedures). Dose reconstructions for individuals employed at SNL-A from January 1, 1995 through December 31, 1996, but who do not qualify for inclusion in the SEC, may be performed using these data as appropriate.

7.4 Evaluation of Petition Basis for SEC-00188 Addendum

An evaluation of the petition basis for SEC-00188 will be presented in the upcoming report addressing the remaining period from January 1, 1997 through May 21, 2011.

7.5 Other Potential SEC Petition Issues Identified During the Evaluation

As applicable, other potential SEC issues identified during the evaluation of SEC-00188 will be presented in the upcoming report addressing the remaining period from January 1, 1997 through May 21, 2011.

7.6 Summary of Feasibility Findings for Petition SEC-00188

This report provides feasibility conclusions for completing dose reconstructions for employees at the SNL-A site from January 1, 1995 through December 31, 1996. NIOSH found that bioassay monitoring program documentation and workplace monitoring data are insufficient to support bounding EEOICPA internal doses for the January 1, 1995 through December 31, 1996 portion of the evaluated. Air monitoring data are judged insufficient due to a lack of required, record retention and review procedures during January 1, 1995 through December 31, 1996 period, as well as logistical issues identifying and retrieving records from long-term storage. Additionally, uncertainties and concerns associated with the transitional and developmental nature of SNL-A's internal monitoring program exist.

Table 7-2 summarizes the results of the feasibility findings at Sandia National Laboratories during the period from January 1, 1995 through December 31, 1996.

Table 7-2: Summary of Feasibility Findings for SEC-00188, Addendum (1995–1996)

Source of Exposure	Reconstruction-Feasible for January 1, 1995–December 31, 1996 (Yes or No)
Internal	No
External	Yes
Gamma	Yes
Beta	Yes
Neutron	Yes
Occupational Medical X-ray	Yes

As of July 25, 2018, a total of 243 claims have been submitted to NIOSH for individuals who worked at SNL-A during the period under evaluation in this report. Dose reconstructions have been completed for 198 individuals (~81%).

Although NIOSH found that it is not possible to reconstruct internal radiation doses for the proposed class, NIOSH intends to use any internal monitoring data that may become available for an individual claim (and that can be interpreted using existing NIOSH dose reconstruction processes or procedures). Therefore, dose reconstructions for individuals employed at SNL-A during the period from January 1, 1995 through December 31, 1996, but who do not qualify for inclusion in the SEC, may be performed using these data as appropriate.

8.0 Evaluation of Health Endangerment for Petition SEC-00188

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 employees 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's evaluation determined that it is not 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, the resulting NIOSH-proposed SEC class must include a minimum required employment period as a basis for specifying that health was endangered.

9.0 Class Conclusion for Petition SEC-00188

Based on its full research of the class under evaluation, NIOSH has defined a single class of employees for which NIOSH cannot estimate radiation doses with sufficient accuracy. The NIOSH-proposed class to be added to the SEC includes all employees of the Department of Energy, its predecessor agencies, and its contractors and subcontractors who worked in any area at Sandia National Laboratories in Albuquerque, New Mexico, from January 1, 1995 through December 31, 1996, 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.

10.0 References

Documented Communications, 2013a, *Documented Communications with Sandia National Laboratories Current or Former Employee*; In-person interview by NIOSH and ORAU Team; January 23, 2013; SRDB Ref ID: 125804

Documented Communications, 2013b, *Documented Communications with Sandia National Laboratories Current or Former Employee*; In-person interview by NIOSH and ORAU Team; January 23, 2013; SRDB Ref ID: 125804

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Documented Communications, 2014j, *Documented Communications with Sandia National Laboratories Current or Former Employee*; In-person interview by NIOSH and ORAU Team; September 10, 2014; SRDB Ref ID: 141875

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SNL, 1996, *Radiological Survey Documentation—Radiation Protection Operations Department Radiation Protection Operating Procedure*, RPO-04-425, Issue No. 04; Sandia National Laboratories (SNL); effective June 5, 1996; SRDB Ref ID: 170190

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Attachment One: Data Capture Synopsis

Attachment One is a summary of SRDB holdings that pertain to the SEC-00188 Addendum evaluation efforts. Table A1-1 includes documents that were located between January 26, 2012 and May 15, 2018, for the purpose of evaluating the post-1994 years. These efforts are in addition to the data capture efforts previously detailed in Attachment One of the SEC-00188 Petition Evaluation Report.

Table A1-1: Summary of Holdings in the SRDB for Sandia National Laboratories-Albuquerque Captured between January 26, 2012 and May 15, 2018

Data Capture Information	Data Capture Description	Date Completed	No. Uploaded into SRDB
Sandia National Laboratories - Albuquerque, New Mexico	Site and area-specific environmental reports, SANDOS and WebDose dosimetry databases, radiation protection and dosimetry procedures, bioassay requests, audits and assessments, a list of cancelled procedures, incident tracking, neutron measurements, air sample results, air sample DAC-hr and dose reports, bioassay reports, bioassay assignments, the technical basis for air monitoring, specific bioassay procedures, DOELAP assessments, failure analyses, and accreditations, radiological technical work documents, radiological work permits, external Advisory Board meeting minutes, listings and bioassay results of selected personnel, radiological incident response, lapel sample results, and the technical basis for implementing air sampling.	Ongoing	531
Cincinnati Public Library	Fission and activation product production, Mo-99 production and waste processing, improved accelerator shielding calculations, photoneutron production, and neutron effects in gallium arsenide laser diodes.	05/02/2012	6
DOE Germantown	A NIOSH researcher's notes from the review of classified documents.	03/18/2014	1
Internet - DOE Noncompliance Tracking System (NTS)	NTS radiological incident reports including program deficiencies, contamination events, radiation exposure events, radioactive material releases, discoveries of legacy material and contamination, unqualified personnel performing surveys, radiological work permit violations, loss of control of radioactive material, radioactive material spills, posting violations, radioactive material quantities exceeding authorization bases, survey and monitoring deficiencies, quality assurance deficiencies, and training deficiencies.	02/07/2017	73
Internet - DOE Occurrence Reporting and Processing System (ORPS)	ORPS radiological reports including contamination events, unauthorized entries into radiological areas, procedural violations, failure to monitor shipping containers, radioactive material releases, radioactive material and contamination in uncontrolled areas, loose contamination found outside posted contamination areas, work conducted without required bioassay, unanticipated radiation exposures, loss of control of radioactive material, discoveries of legacy materials and contamination, identification of a previously unrecognized radiological area, unauthorized entries into radiological areas, radiological work permit violations, improper transfer and transportation of radioactive material, failures to follow procedures, tritium leaks from equipment, and a tritium stack release.	06/29/2017	187
Internet - DOE Office of Scientific and Technical Information (OSTI) Energy Citations	The fourth revision of Sandia acronyms, initialisms, and abbreviations.	05/07/2012	1

Data Capture Information	Data Capture Description	Date Completed	No. Uploaded into SRDB
Internet - DOE Office of Scientific and Technical Information (OSTI) Information Bridge	Institutional plans, emergency preparedness approach, building hazard analyses, management of depleted uranium, a laboratory history, transportation technology, and the environmental baseline.	04/17/2013	9
Internet - DOE Office of Scientific and Technical Information (OSTI) SciTech Connect	The proceedings of a fast burst reactor workshop.	05/01/2018	1
Internet - Google	Z Machine fusion technology reports, a compliance self-assessment, occupational radiation exposure summaries, independent oversight audits, the FY 2014 ten-year site plan, the impact of switching to ICRP-74 neutron flux to dose rate conversion factors, the characterization of a neutron irradiation system, a preliminary notice of violation for 1997 and 1998 events, 1994 status reports on the implementation of the DOE radiological control manual, and the approach for determining the need for air sampling.	05/01/2018	22
Internet - National Institute for Occupational Safety and Health (NIOSH)	The February 2012 SEC-00188 Petition Evaluation Report, the May 2012 designation of a class of Sandia employees, and minutes of the 70th meeting of the Advisory Board on Radiation and Worker Health.	08/31/2015	3
NIOSH	A NIOSH Research Health Scientist's meeting and research notes, an ORAU Team Health Physicist's meeting notes, the tables list for the WebDose database, the tables list for the SANDOS database, a draft internal dosimetry database, and occupational dose records for 23 selected workers.	03/02/2016	11
ORAU Team	The Sandia Site Profile, the report of a 2007 data capture trip, a 1995 to 2011 Nuclear Materials Management and Safeguards System report, documented communications with key Sandia personnel, and a radiation protection self-assessment listing.	12/07/2017	20
Sandia National Laboratory - Livermore, California	Interview notes of SNL/CA personnel.	04/29/2013	1
TOTAL	Not Applicable	Not Applicable	866

Table A1-2: Database Searches for Sandia National Laboratories-Albuquerque Captured between January 26, 2012 and May 15, 2018

Database/Source	Keywords	Hits	Uploaded into SRDB
Defense Technical Information Center (DTIC) COMPLETED 10/06/2017	Database search terms and Internet URL are available in the Excel file called "Sandia NM SEC Addendum (Rev 01) and Full (Rev 04) 06-25-18" under the Summary of SRDB Holdings tab.	1,091	0
DOE Comprehensive Epidemiologic Data Resource (CEDR) COMPLETED 05/27/2010	Database search terms and Internet URL are available in the Excel file called "Sandia NM SEC Addendum (Rev 01) and Full (Rev 04) 06-25-18" under the Summary of SRDB Holdings tab.	4	0
DOE Hanford Declassified Document Retrieval System (DDRS) and Public Reading Room COMPLETED 04/10/2013	Database search terms and Internet URL are available in the Excel file called "Sandia NM SEC Addendum (Rev 01) and Full (Rev 04) 06-25-18" under the Summary of SRDB Holdings tab.	38	0
DOE Legacy Management Considered Sites COMPLETED 04/10/2013	Database search terms and Internet URL are available in the Excel file called "Sandia NM SEC Addendum (Rev 01) and Full (Rev 04) 06-25-18" under the Summary of SRDB Holdings tab.	0	0
DOE National Nuclear Security Administration (NNSA) - Nevada Site Office COMPLETED 10/05/2017	Database search terms and Internet URL are available in the Excel file called "Sandia NM SEC Addendum (Rev 01) and Full (Rev 04) 06-25-18" under the Summary of SRDB Holdings tab.	730	0
DOE OpenNet COMPLETED 04/10/2013	Database search terms and Internet URL are available in the Excel file called "Sandia NM SEC Addendum (Rev 01) and Full (Rev 04) 06-25-18" under the Summary of SRDB Holdings tab.	560	16
DOE OSTI Energy Citations COMPLETED 04/10/2013	Database search terms and Internet URL are available in the Excel file called "Sandia NM SEC Addendum (Rev 01) and Full (Rev 04) 06-25-18" under the Summary of SRDB Holdings tab.	1,340	1
DOE OSTI Information Bridge COMPLETED 04/10/2013	Database search terms and Internet URL are available in the Excel file called "Sandia NM SEC Addendum (Rev 01) and Full (Rev 04) 06-25-18" under the Summary of SRDB Holdings tab.	2,609	23
DOE OSTI SciTech Connect COMPLETED 04/10/2013	Database search terms and Internet URL are available in the Excel file called "Sandia NM SEC Addendum (Rev 01) and Full (Rev 04) 06-25-18" under the Summary of SRDB Holdings tab.	247	0
Energy Employees Claimant Assistance Project (EECAP) COMPLETED 01/10/2014	Database search terms and Internet URL are available in the Excel file called "Sandia NM SEC Addendum (Rev 01) and Full (Rev 04) 06-25-18" under the Summary of SRDB Holdings tab.	15	3
Google COMPLETED 10/06/2017	Database search terms and Internet URL are available in the Excel file called "Sandia NM SEC Addendum (Rev 01) and Full (Rev 04) 06-25-18" under the Summary of SRDB Holdings tab.	4,381,733	132
Health Physics Journal COMPLETED 10/06/2017	Database search terms and Internet URL are available in the Excel file called "Sandia NM SEC Addendum (Rev 01) and Full (Rev 04) 06-25-18" under the Summary of SRDB Holdings tab.	346	6

Database/Source	Keywords	Hits	Uploaded into SRDB
International Journal of Occupational and Environmental Health COMPLETED 10/05/2017	Database search terms and Internet URL are available in the Excel file called "Sandia NM SEC Addendum (Rev 01) and Full (Rev 04) 06-25-18" under the Summary of SRDB Holdings tab.	3	0
National Academies Press COMPLETED 04/10/2013	Database search terms and Internet URL are available in the Excel file called "Sandia NM SEC Addendum (Rev 01) and Full (Rev 04) 06-25-18" under the Summary of SRDB Holdings tab.	2,253	1
NRC ADAMS Reading Room COMPLETED 04/10/2013	Database search terms and Internet URL are available in the Excel file called "Sandia NM SEC Addendum (Rev 01) and Full (Rev 04) 06-25-18" under the Summary of SRDB Holdings tab.	4,290	11
United States Army Corps of Engineers (USACE) COMPLETED 04/10/2013	Database search terms and Internet URL are available in the Excel file called "Sandia NM SEC Addendum (Rev 01) and Full (Rev 04) 06-25-18" under the Summary of SRDB Holdings tab.	0	0
U.S. Transuranium & Uranium Registries COMPLETED 04/10/2013	Database search terms and Internet URL are available in the Excel file called "Sandia NM SEC Addendum (Rev 01) and Full (Rev 04) 06-25-18" under the Summary of SRDB Holdings tab.	0	0