Simonds Saw and Steel
Residual Contamination Period

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July 29, 2014
Idaho Falls, Idaho
Site description

- Lockport, New York
- Atomic Weapons Employer (AWE) 1948 – 1957
- Residual Radiation period 1958 – March 1, 2011
- Rolled uranium (U) billets into rods for the Atomic Energy Commission (AEC) and hammered, forged, and rolled thorium (Th) metal
AWE Operations

- Utilized 16-inch and 10-inch rolling mills and hammer forge
- Some U monitoring data, but sparse information on Th work and exposures
- Some area cleanup before AEC contract ended
Residual Period

- Fixed contamination and contaminated soil remained (primarily U)
- Continued to operate as a steel plant until 1983 bankruptcy
- Extensive characterizations for radiation and contamination
Special Exposure Cohort Petition

- NIOSH received petition on December 4, 2009
- Petitioner-requested Special Exposure Cohort (SEC) class

\[ \text{All employees who worked in any area at Simonds Saw and Steel, Lockport, New York, during the applicable covered operational and residual periods from 1948 through 2006} \]

- Petition qualified for evaluation March 8, 2010 based on lack of Th monitoring data
Evaluation Report

- NIOSH issued the report on October 29, 2010
- Recommended class of All AWE employees who worked at Simonds Saw and Steel from January 1, 1948, through December 31, 1957
- NIOSH found that doses could be reconstructed during the residual period
Board Actions

- On November 16, 2010, NIOSH presented the report to the Advisory Board on Radiation and Worker Health (the Board) in Santa Fe, New Mexico.

- Added SEC class from 1948 through 1957 (HHS designation effective February 5, 2011).

- Postponed the residual contamination period discussion until after site profile reviews.
Site Profile Review

- In June 2012, SC&A submitted its review of the site profile (ORAUT-TKBS-0032 Revision 1) to the Board
- SC&A reported 7 Findings for additional evaluation/discussion
- Provided additional observations on the site profile
SC&A’s Site Profile Findings

- **Findings 1 through 5**
  - Comments on various details of the external and internal dose models during the AWE operational period (the SEC period)
  - Discussed by the TBD-6000 Work Group, NIOSH, and SC&A and set aside pending a Site Profile revision

- **Findings 6 and 7**
  - Focused on the external and internal doses, respectively, during the residual contamination period
Findings 6 and 7

- Finding 6:  
  More Quantitative and Substantive Discussion of Available External Monitoring During the Residual Period

- Finding 7:  
  Appropriateness of Chosen Internal Methodology during Residual Period and Consistency with OTIB-0070
Residual Period Radiation Exposures

- **Internal Dose:** Inhalation and ingestion of U and Th from residual contamination
- **External dose:** Photon and beta exposure from residual U and Th contamination
- **Analytical data** indicates contamination is >99% U
SC&A Finding 6 Issues

- More discussion of available radiation survey data during the residual period
- Values used to determine the gamma dose rate distribution
- Beta dose rates at the 10-inch-bar mill
- Number of work hours used to calculate annual doses
Responses to Finding 6

- Dose rate surveys were performed in 1957 after clean up and prior to AEC contract ended
- Characterization surveys were performed in 1976 and 1980 while the plant was still operating
- After plant closure in 1983, characterization surveys were performed in 1984, 1999, and 2007
Responses to Finding 6 (cont.)

NIOSH recommended changes to the Site Profile

- Gamma dose rate of 0.08 mR/hour for 2,500 hours per year to be applied as a constant

- Beta dose rate of 1.35 mrad/hour for 2,500 hours per year to be applied as a constant

- Assumptions are presumed to provide a bounding annual dose to operators of the rolling mill after AEC contract work ended
SC&A Finding 7 Issues

- Air concentration at the beginning of the residual contamination period
- Explain how Exposure Point Concentrations were developed from the 2007 survey data
- Provide additional justification for presuming source term depletion ended in 1982
- The number of work hours used to calculate intake rates
Responses to Finding 7

Air concentration at the start of residual period:

- Reviewed available data
- Evaluated general area air concentrations measured during U rolling operations in 1954
- Proposed a revised value to use for the estimate of air concentration at the beginning of the residual period
Responses to Finding 7 (Cont.)

The 2007 Exposure Point Concentrations (EPC) were:

- Taken from the U.S. Army Corps of Engineers (USACE) Remedial Investigation Report
- Surface contamination data and calculation methods and results summarized in the Remedial Investigation Report
- EPC was reported for each building based on thousands of measurements of surface contamination data from 2007
- EPC was the 95% upper confidence limit
Responses to Finding 7 (Cont.)

NIOSH made additional data requests to the USACE, and received:

- Copies of survey reports and maps
- Survey reports in spreadsheet format
- Spreadsheets used to analyze data
- Other analytical data from the remedial investigation
Responses to Finding 7 (Cont.)

NIOSH evaluated the 2007 contamination data:

- Determined a favorable value for the mostly highly contaminated areas, eliminating hundreds of survey points of remote areas of the plants and exterior surface.
- NIOSH also evaluated contamination data from previous characterization in 1999.
- Recommended a revised upper 95% confidence limit value based on the building with the highest surface contamination.
Responses to Finding 7 (Cont.)

Source term depletion response:

- The re-evaluated data is inconclusive on whether source depletion continued or ended when rolling mill closed
- Building 24 is an active work area (not isolated), part of it has contaminated overhead beams
- NIOSH now recommends assuming depletion throughout the residual period by depleting the initial air concentration estimates at a rate to agree with the 2007 air concentration estimates
Summary

- Revise the Site Profile to address findings and comments in the Review

- Proposed changes to the Site Profile were discussed with SC&A and the TBD-6000 Work Group

- Changes are being made for:
  - partial dose reconstructions for the AWE operational period and for full dose reconstructions for the residual period
Dose Reconstruction Feasibility

- NIOSH found the available data are insufficient to estimate dose from thorium for the AWE Contract Period, SEC from 1948 – 1957

- NIOSH determined all doses can be reconstructed for the Residual Contamination Period, 1958 – March 2011