

TBD 6000 Work Group Update: Joslyn Manufacturing and Supply Co.

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Overview of Joslyn Site

- Located in Fort Wayne, Indiana
- Performed uranium processing operations in support of Manhattan Engineer District from March 1, 1943, through December 31, 1946 (NIOSH, 2014)
- Work continued under auspices of the Atomic Energy Commission: January 1, 1947, through December 31, 1952 (SC&A, 2015a)
 - Instrumental in developing procedures for rolling natural uranium into metal rods
 - Specific activities included tempering, hot rolling, quenching, straightening, cooling, grinding, waste burning, and abrasive cutting

Summary of Existing Joslyn Site SEC-200 Designation

- SEC Petition 200 qualified for evaluation on May 10, 2012
- Advisory Board discussions:
 - December 12, 2012
 - January 28, 2014
- Designated class: All AWE employees at the Joslyn site from March 1, 1943, through July 31, 1948
- Effective date of class: April 26, 2014

Joslyn Site Profile History

- Appendix J of Battelle-TBD-6000 (NIOSH, 2014) constitutes the Joslyn site profile, effective October 7, 2014
- Reviewed by SC&A (2015a):
 - Effective date: May 12, 2015
 - Contained 7 findings
 - Finding 1 addresses assumed uranium processing days
 - Additionally produced an “Issues Resolution Matrix” to summarize main discussion points (SC&A, 2015b)
- NIOSH (2023) responded to Finding 1 on July 19, 2023, with an updated evaluation
- Remaining 6 findings are still open for response and discussion

SC&A Finding 1: Uranium Workdays

SC&A reevaluated available documentation captured by NIOSH

- Original NIOSH evaluation primarily based on days when processing was specifically mentioned in historical documentation
- Some additional workdays were assumed if quantity of material was referenced
- Work performed under Joslyn's contract with the University of Chicago was not adequately considered
- Uranium processing days are an essential element of performing dose reconstructions at Joslyn (basis of annual internal intakes and external dose estimation)

Overview of SC&A Findings 2–4

- **Finding 2:** Inhaled uranium intakes underestimated, due to underestimated uranium workdays (related to Finding 1)
- **Finding 3:** Photon and electron doses from contaminated floor underestimated by neglecting enhanced concentrations of short-lived uranium progeny, called the “Putzier effect” (Putzier, 1982)
 - Issue discussed for other sites by the TBD 6000 Work Group and by the Subcommittee for Procedure Reviews for multiple sites
 - General agreement that statistical treatment of doses (i.e., application of the GSD of 5) adequately accounts for this enhanced effect
- **Finding 4:** Doses from external exposure to penetrating radiation from uranium underestimated during 7 years of the 10-year covered period, as noted in Findings 1 and 3.

Overview of SC&A Findings 5–7

- **Finding 5:** Exposures from contaminated surfaces, expressed in milliroentgens, improperly added to doses from uranium metal, expressed as personal dose equivalents, $H_p(10)$, in units of millirem.
- **Finding 6:** Doses to skin from nonpenetrating radiation from uranium underestimated due to failure to incorporate the Putzier effect in estimating the dose rates from electrons emitted from uranium metal and uranium dust on contaminated floors (Finding 3) and an underestimate of uranium workdays (Finding 1).
- **Finding 7:** Underestimated doses to skin from external exposure to thorium rods due to incorrect geometry in the NIOSH-generated Monte Carlo N-Particle Transport (MCNP) analysis

TBD 6000 Work Group Update

- Joslyn site under the purview of the TBD 6000 Work Group
- Work Group met February 14, 2024
 - SC&A (2024) presented original Finding 1 from 2015
 - NIOSH (2024) presented technical response to SC&A finding
- Work Group discussion and path forward
 - SC&A tasked with review of NIOSH response to Finding 1 for technical accuracy
 - SC&A to update Joslyn Issue Resolution Matrix on remaining findings for applicability considering current dose reconstruction policies and procedures
 - NIOSH continues to evaluate remaining six SC&A findings as appropriate

Questions?

References (1 of 2)

National Institute for Occupational Safety and Health. (2014). *Site profiles for Atomic Weapons Employers that worked uranium metals – Appendix J – Joslyn*. (Battelle-TBD-6000, Appendix J, rev. 0). <https://www.cdc.gov/niosh/ocas/pdfs/tbd/b-6000-apj-r0.pdf>

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SC&A, Inc. (2015a). Review of “Site profiles for Atomic Weapons Employers that worked uranium metals: Appendix J – Joslyn” (SCA-TR-SP2015-0050, rev. 0).

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SC&A, Inc. (2015b). *Issue resolution matrix for SC&A findings on Appendix J to TBD-6000*.

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