

Electro Metallurgical Corporation: Special Exposure Cohort Petition Evaluation (Report 00136-Rev 1)

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Electro Metallurgical

■ Site History

- **Electro Metallurgical Corporation (Electromet) was located in Niagara Falls, New York and began uranium operations in 1942 under contract with the Manhattan Engineer District (MED).**
- **From August 13, 1942 through June 1953, the plant intermittently produced uranium metal from uranium tetrafluoride, in a thermal reduction process employing magnesium.**

Electro Metallurgical—cont.

- Electromet was subsequently acquired by Union Carbide, which was acquired, in turn, by Dow Chemical.
- 1942-1951: Uranium operations were carried out, with two standby periods. On June 30, 1953, all AEC operations formally ceased.
- Uranium was the only significant radioactive material present at Electromet.

Petition Overview

- **November 17, 2008: petition received**
- **December 8, 2008: additional petition received**
- **March 12, 2009: petition received on November 17, 2008, qualified for evaluation and was merged with the petition received on December 8, 2008**
- **July 23, 2009: Evaluation Report issued**
- **July 2009: SC&A issued a report reviewing the evaluation report**
- **October 2009: Evaluation Report presented to the Advisory Board**

Petition Overview—cont.

- The Advisory Board Working Group has met several times to discuss various issues regarding Electromet
- November 2011: NIOSH notified the Working Group of its intent to propose that a portion of the covered period at Electromet be added to as class
- January 31, 2012: Revision 1 of the NIOSH Evaluation Report issued
- February 21, 2012: SC&A issued a partial review of the revised NIOSH Evaluation Report

Proposed SEC Class

- **Petitioner proposed class definition:**
“All workers who worked in any area at the Electro Metallurgical Corporation facility from August 13, 1942 through December 31, 1953.”
- **Class evaluated by NIOSH:**
“All workers who worked in any area at the Electro Metallurgical Corporation facility from August 13, 1942 through June 30, 1953.”

Sources of Available Information

- DOE Legacy Management Considered Sites and Office of Scientific and Technical Information database (OSTI)
- ORAU Team Technical Information Bulletins, Procedures, and the Technical Basis Documents
- Electromet Plant Health Protection Surveys, safety standards, and operating procedures

Sources of Available Information—cont.

- **NIOSH Site Research Database documents**
- **Interviews with former Electromet employees**
- **Case files in NIOSH OCAS Claims Tracking System**
- **Documentation provided by petitioners**

Availability of Dosimetry Data

NIOSH OCAS Claims Tracking System

Information available as of February 16, 2012

■ Electromet claims submitted to NIOSH	104
■ Dose reconstructions completed	102
■ Claims containing internal dosimetry	1
■ Claims containing external dosimetry	1
■ Claims completed with POC >50%	48

Petition Bases/Concerns

- Few workers were monitored for external exposure in the Manhattan Engineer District (MED)/Atomic Energy Commission (AEC)/Department of Energy (DOE) period
- Effectiveness of worker health protection and industrial health programs

Unmonitored Workers

- **Summary of monitoring at Electromet**
 - **Monitored workers intermittently to establish exposure levels**
 - **Issued dosimeters to employees in 1944 and 1948-1949, and some results are available**
 - **Some urinalysis data are available for 1944 and 1949**
 - **Major improvements in processes to protect worker health were documented to occur in late 1947**

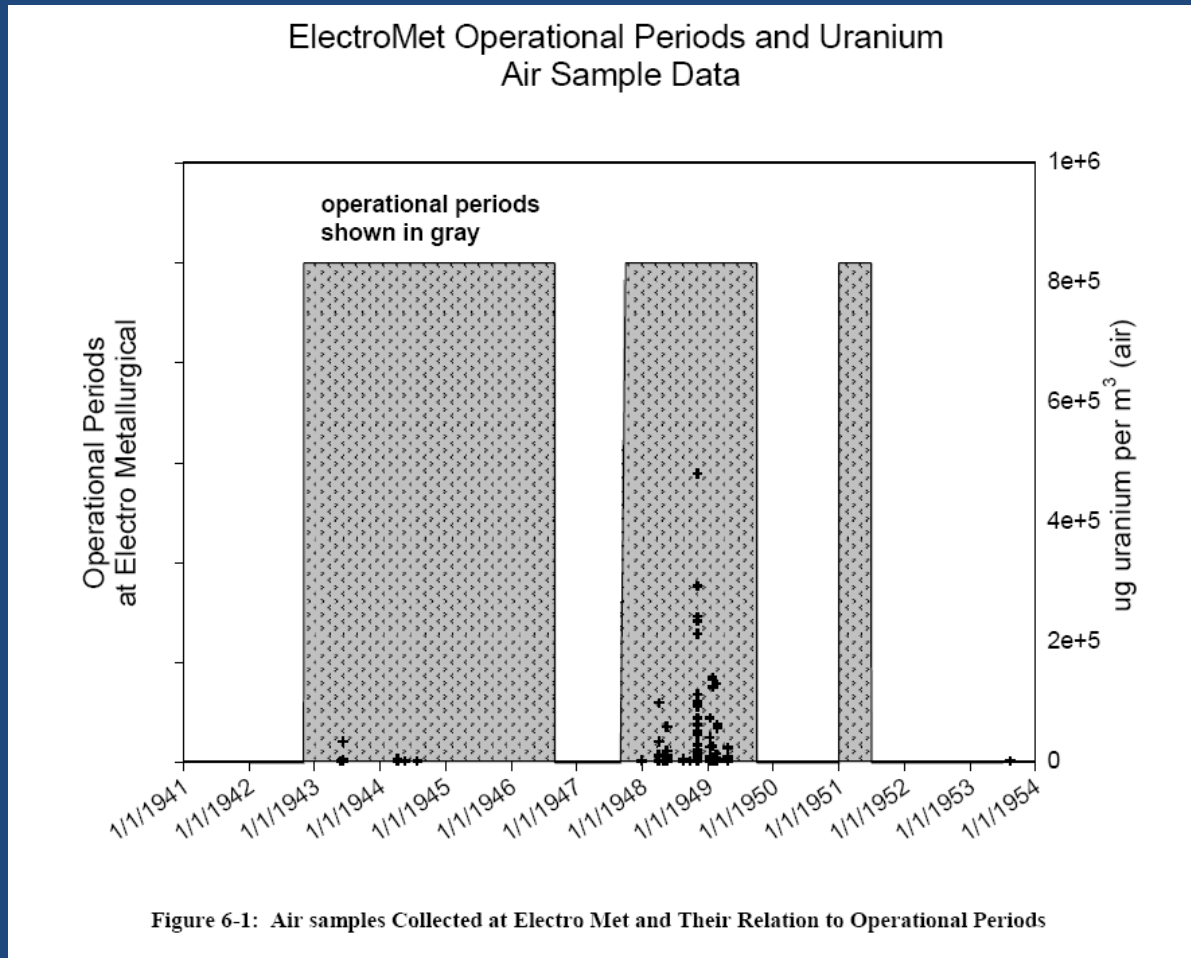
Unmonitored Workers—cont.

- Only a handful of air sample data of either Breathing Zone (BZ) or General Area (GA) type are available prior to 1948.
 - The air data is at odds with the later air data (collected after health improvements), it lends very little credibility for its use or that it was useful at the time to determine which workers should have been monitored
- Data and monitoring programs after 1948 are much better documented
- Early urine data available to NIOSH collected from a single campaign

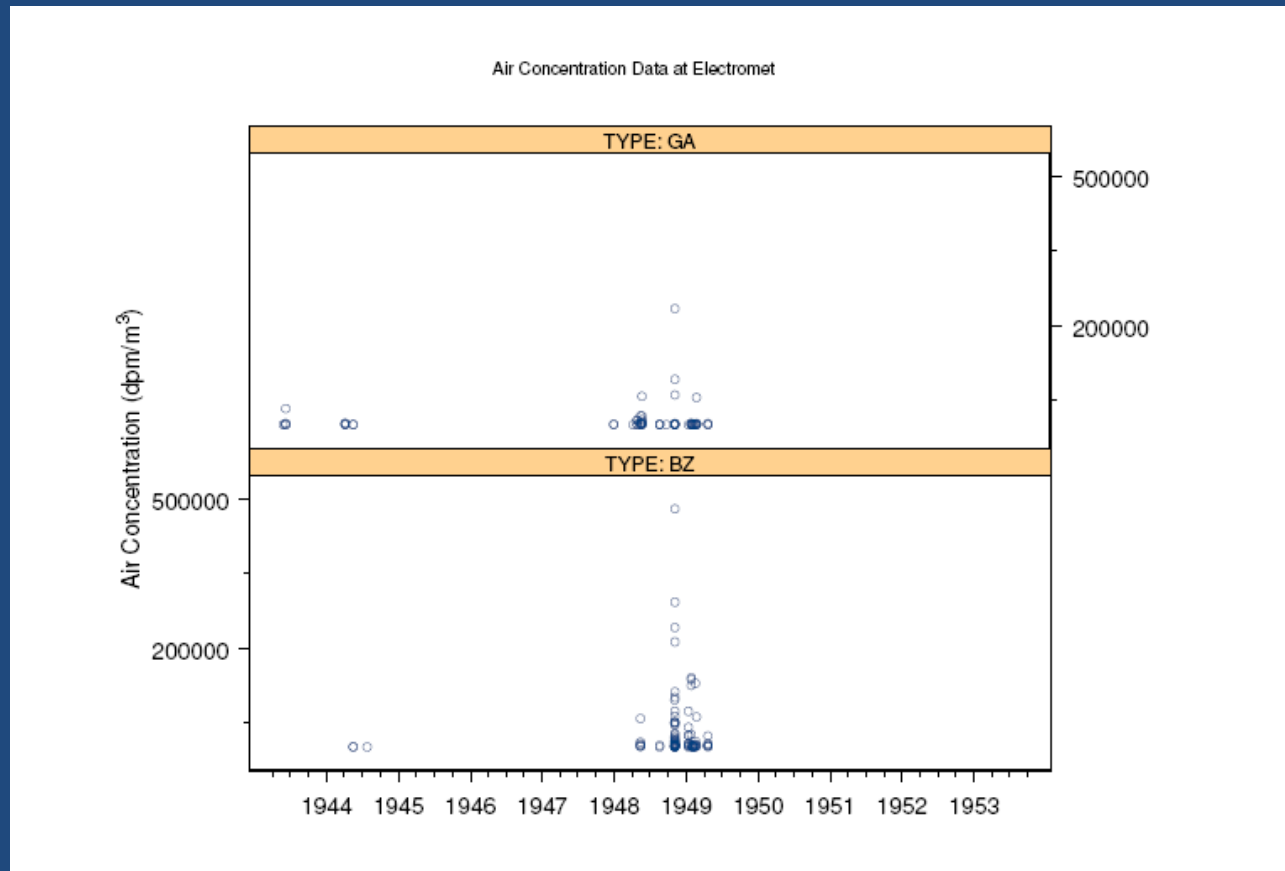
Unmonitored Workers—cont.

- While a portion of the population was monitored, it is not possible to determine if the highest exposed workers were monitored nor is there a group which would constitute an appropriate surrogate data or coworker group

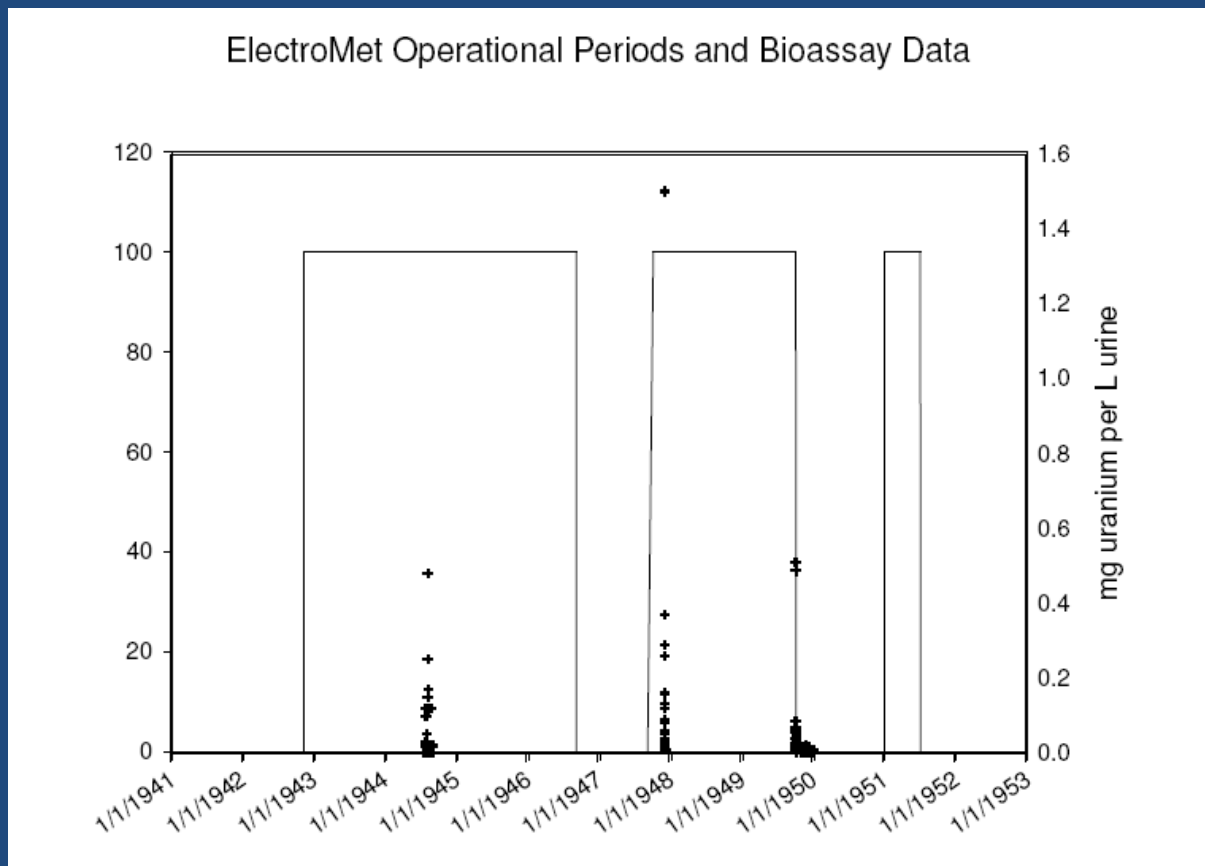
Air Sampling at Electro Metallurgical



Comparison of Early and Late Air Sampling Data by Type

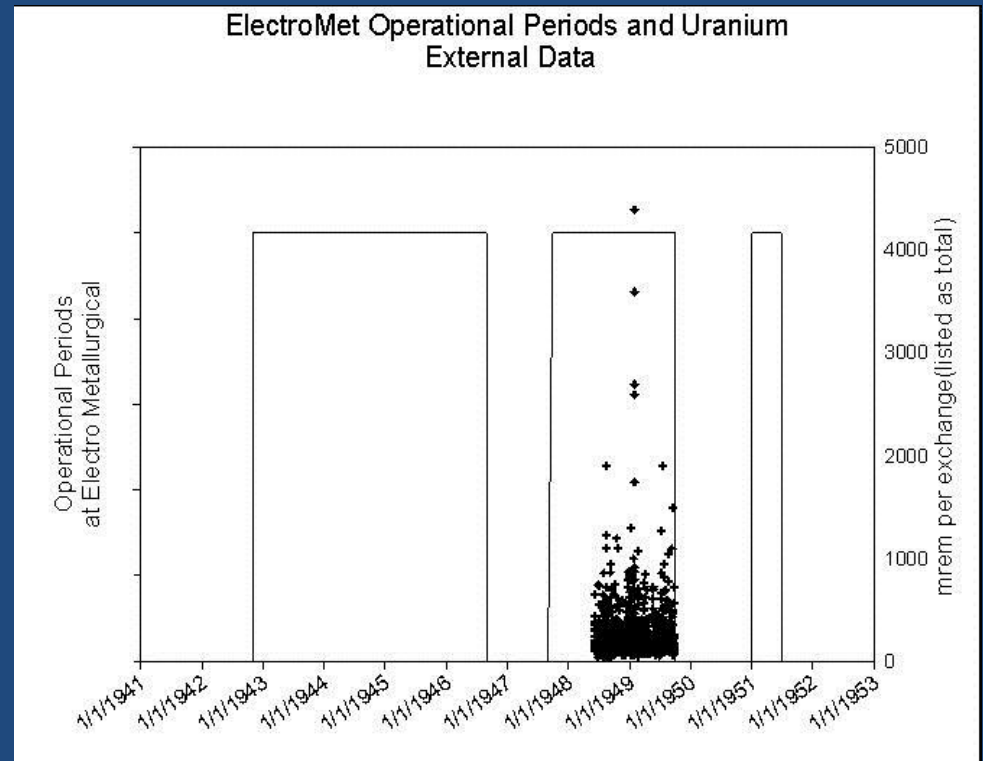


Bioassay Data Availability



External Dose

- NIOSH has several thousand external dosimetry measurements (primarily from the 2nd operational period)
- The available external data and process knowledge allow for a boundable dose to be determined
- The Technical Basis Document for Electromet will be updated



Medical dose

- **Electro Metallurgical has several references describing the medical program (pre-employment, annual, and termination X-rays)**
- **TIB 6, Dose Reconstruction from Occupational Medical X-ray Procedures, shall be used used with site specific information to evaluate medical dose during the entire covered period**

Summary of Findings

- **NIOSH has determined that neither the bioassay nor the early limited air sampling data are sufficient to bound the dose at Electromet for the period August 13, 1942 through December 31, 1947**

Evaluation Process

- **Two-Prong Test established by EEOICPA and incorporated into 42 C.F.R. § 83.13 (c)(1) and 42 C.F.R. § 83.13 (c)(3):**
 - 1. Is it feasible to estimate the level of radiation doses of individual members of the class with sufficient accuracy?**
 - 2. Is there a reasonable likelihood that such radiation dose may have endangered the health of members of the class?**

Feasibility of Dose Reconstructions

- NIOSH finds it is not feasible to estimate internal exposures with sufficient accuracy for all workers at the site from August 13, 1942 through December 31, 1947.
- Internal monitoring data, work area radiological monitoring data, and source term data are not sufficient to provide a sufficiently accurate estimate of the bounding internal dose during this early period at Electromet.

Feasibility of Dose Reconstructions—cont.

- With the exception of this class, 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 more precisely than an estimate of maximum dose. Information available from the site profile and additional resources is sufficient to document or estimate the maximum internal and external potential exposure to members of the evaluated class under plausible circumstances during the specified period from January 1, 1948 through June 30, 1953.

Proposed Class

All employees of the Department of Energy, its predecessor agencies, and their contractors and subcontractors who worked at the Electro Metallurgical site in Niagara Falls, New York, for the period from August 13, 1942 through December 31, 1947, 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.

Summary

Feasibility Findings for ElectroMet Petition SEC-00136 August 13, 1942 – June 30, 1953

Source of Exposure	Reconstruction Feasible	Reconstruction NOT Feasible
Internal		
- Uranium	1/1/1948-6/30/1953	8/13/1942-12/31/1947
External		
- Gamma/Photon	All years	
- Beta	All years	
- Neutron	N/A	
- Occ. Medical X-ray	All years	