Winchester Engineering and Analytical Center Special Exposure Cohort Petition Evaluation Report

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Petition Overview

- August 8, 2008: NIOSH determined that dose reconstruction would not be feasible for Winchester Engineering and Analytical Center (WEAC) claims
  - No claims with a presumptive cancer existed at that time to pursue an 83.14 SEC petition
- November 2011: NIOSH receives a WEAC claim with a presumptive cancer
- March 5, 2012: NIOSH notified the claimant and provided a copy of Special Exposure Cohort (SEC) Petition Form A
- March 13, 2012: Petition (83.14) received
- April 27, 2012: NIOSH Evaluation Report approved

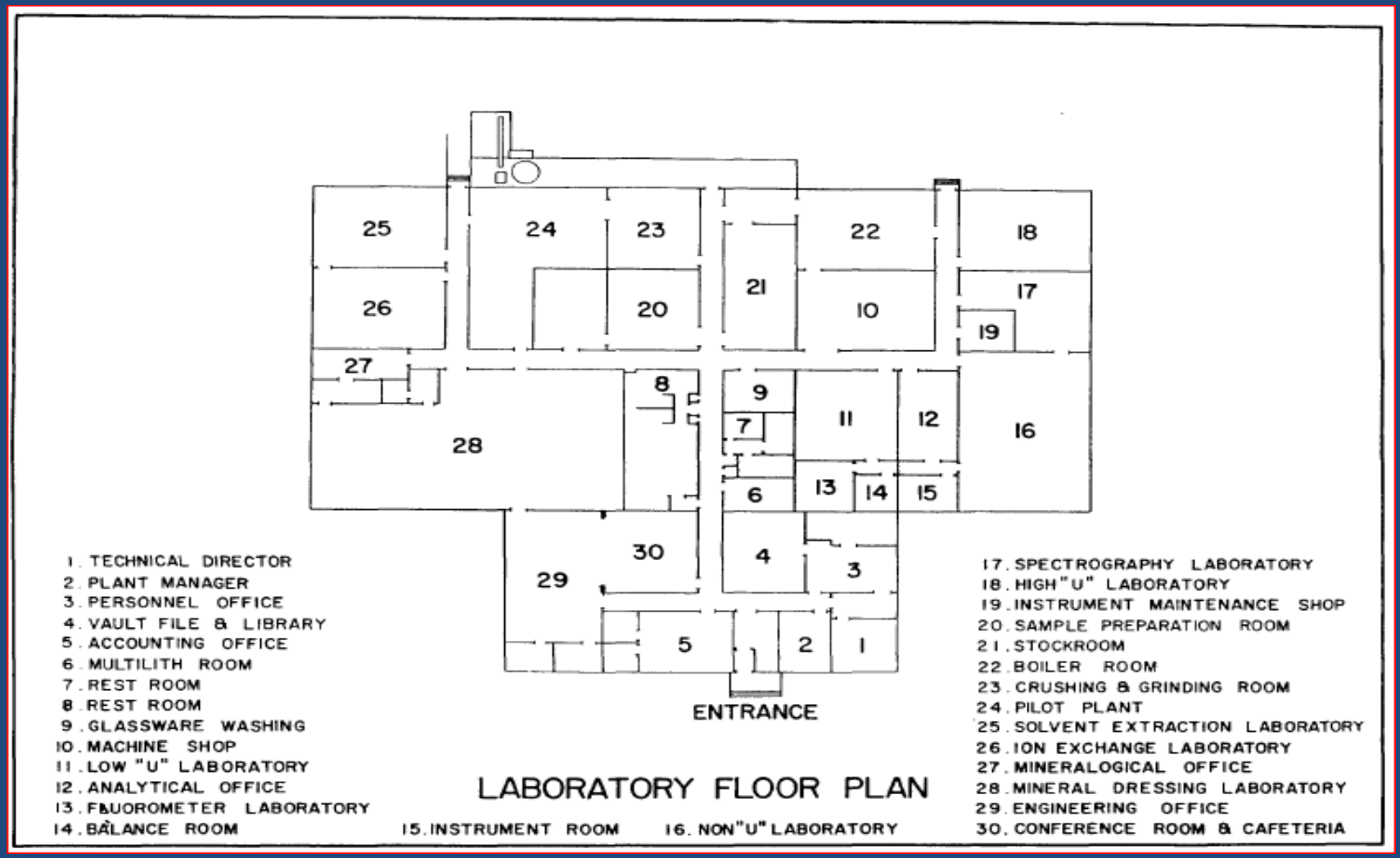
Background

- WEAC was also known as:
  - U.S. Public Health Service; N.E. Radiological Laboratory
  - Northeastern Radiological Health Laboratory
  - National Lead Co
  - AEC Raw Materials Development Laboratory
- Located in Winchester, Massachusetts
- Department of Energy site from 1951 through 1961
- Participated in the development of methods of extraction of uranium and thorium from ore and prepared metal grade uranium tetrachloride

Background—cont.

- Located on 5.8 acres approximately 15 miles from Boston
- Main facility was a single floor masonry building with a floor area of approximately 31,000 ft^2
- Approximately 30 rooms with labs, work area, shops, and offices
- Also on site, a solvent storage building and small pilot plant housed in a corrugated metal building
- Workforce of approximately 70 – 100 workers

Background—cont.



LABORATORY FLOOR PLAN

Sources of Available Information

- ORAU Team Technical Information Bulletins (TIBs) and Procedures
- Interview with former WEAC employee
- Existing claimant files
- Documentation provided by petitioner
- NIOSH Site Research Database
- Data captures

Data Capture Efforts

- U.S. Atomic Energy Commission
- DOE Legacy Management
- DOE Opennet (OSTI database)
- Internet search
- NRC (ADAMS)
- NARA Atlanta
- Various DOE locations

Data Capture Efforts—cont.

- NIOSH also contacted the National Lead Company, American Cyanamid, Wyeth General Insurance, the FDA in their capacity as former administrators of the facility

Previous Dose Reconstructions

NIOSH OCAS Claims Tracking System

Information available as of May 22, 2012

- **WEAC claims submitted to NIOSH** **3**
- **Claims with employment during the period evaluated (1952-1961)** **3**
- **Claims containing internal dosimetry** **0**
- **Claims containing external dosimetry** **0**

Winchester Operations (1952-1961)

- Main operation focused on the research and development of technology for extracting uranium and thorium from ores from various mills
- In 1957, WEAC extended its research to developing methods for reducing radiological hazards from mill operations
- In 1959, the facility transitioned from the development of production methods to testing uranium waste environmental analysis methods and performing laboratory testing and analysis

Potential Radiation Exposures During the Class Period

- Internal sources of exposure
  - Uranium and uranium progeny (e.g., radium, thorium, and radon) from ore and raffinates
  - Thorium and thorium progeny (e.g., radium, thorium, and thoron) from ore
- External sources of exposure
  - Photon/beta exposure from uranium and thorium ores and raffinates
  - Neutrons were not a significant source of external exposure to WEAC personnel

Personal and Area Monitoring Data

- Internal monitoring data
  - Approximately 50 uranium urine samples for 1952-1955
  - Limited radon breath analysis for 1955
  - Air sample data
    - —Seven breathing zone samples for 1953
    - —Twenty-five uranium dust samples for 1955
    - —Eight air samples for Radon in 1955
- External monitoring data
  - No external monitoring data for the covered period
  - Limited process information is available for exposure scenario development
  - Limited source-term information is available

Source-Term and Process Description

- Minimal information on quantities of thorium and uranium maintained on site
- Reports do indicate a wide variety of forms of uranium bearing materials were used for research and pilot plant projects on site
  - Ore, metal, pitchblende, and uranium oxide
- Very little information is available describing the pilot processes, testing, or laboratory work conducted at WEAC

Feasibility of Dose Reconstructions

- Available monitoring records, process descriptions, and source-term data are inadequate to complete dose reconstructions with sufficient accuracy for the evaluated class of employees during the period from January 1, 1952 through December 31, 1961
- The findings from this SEC evaluation are consistent with the SEC determinations for facilities with similar radiological exposures:
  - Mallinckrodt
  - Harshaw
  - Linde 1942-1947

Feasibility Summary

Feasibility Findings for WEAC		
Source of Exposure	Dose Reconstruction Feasible	Dose Reconstruction NOT Feasible
Internal		
		X
External		
- Beta-Gamma		X
- Neutron	N/A	
- Occupational Medical X-ray	X	

Health Endangerment

- The evidence reviewed in this evaluation indicates that some workers in the class may have accumulated chronic radiation exposures through intakes of radionuclides and direct exposure to radioactive materials.

- Consequently, NIOSH is specifying that health may have been endangered for those workers covered by this evaluation who were employed for a number of work days aggregating at least 250 work days within the parameters established for this class or in combination with work days within the parameters established for one or more other classes of employees in the SEC .

Proposed Class

All employees of the Department of Energy, its predecessor agencies, and DOE contractors or subcontractors who worked at the Winchester Engineering and Analytical Center in Winchester, Massachusetts from January 1, 1952 through December 31, 1961, 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.

Recommendation

- For the period January 1, 1952 – December 31, 1961, NIOSH finds that radiation dose estimates cannot be reconstructed for compensation purposes

Class	Feasibility	Health Endangerment
January 1, 1952 – December 31, 1961	No	Yes