





November 28, 2001 Project Seminar

Historical Document

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Project Seminar

Members of the project team gave a seminar to LANL Environment Safety and Health personnel. The seminar covered progress on the project's document reviews, challenges in reconstructing releases of toxic chemicals, methods for collecting and adjusting radionuclide effluent data, methods for estimating early D-Building plutonium releases, and an update on the prioritization of radionuclide releases.

	Los Alamos Historical Document Retrieval and Assessment Project
	ES&H Seminar- <i>"What we are doing, what we are finding, and what we are doing with it."</i>
  	Thomas Widner, M.S., C.H.P., C.I.H. Susan Flack, M.S. Joseph Shonka, Ph.D.

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Topics to be Covered

- Goals of the project
- Information gathering methods
- What we are selecting as relevant
- Identification of materials that were used and likely released

- **Prioritization of past releases**
 - Chemicals
 - Radionuclides
- **Key areas where we need information**

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Dose Reconstruction

is a comprehensive analysis of the exposure received by individuals in the vicinity of facilities that released contaminants to the environment

- “real doses to real people.”

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CDC’s Phases of Dose Reconstruction

- **Retrieval and Assessment of Data**
- **Initial Source Term Development and Pathway Analysis**
- **Screening Dose and Exposure Calculations**
- **Development of Methods for Assessing Environmental Doses**
- **Calculation of Environmental Exposures, Doses, and Risks**

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We seek information regarding

- materials that were used at LANL,
- facilities they were used in,
- processes they were subjected to,
- measures taken to contain materials,
- monitoring of wastes and effluents,
- environmental measurements, and
- locations and activities of residents.

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CDC Principles

- **Scientific integrity**
- **Open and effective communication**
- **Collaboration with partners
throughout the nation & the world**

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Where We Have Been Working

- **LANL Central Records Center**
Paper documents in boxes and file drawers,
microfilm/fiche, notebooks, films
- **LANL Report Collection**
Technical reports on paper and microfiche,
unclassified reports on the Internet
- **ES&H Records Center**
Documents in boxes
- **Directorate Office for ALDNW**
Documents in vaults and safes

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Progress with Document Review

- **Boxes of documents reviewed:** 14,814
- **Drawers of notebooks reviewed:** 1,427
- **Records Ctr. microfilm reviewed:** 50%
- **Reports reviewed:** 37,063
- **Document Summaries prepared:** 2,746

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Special Topics Relevant to Prioritization

- **Special challenges with reconstructing uses and releases of toxic chemicals-** *Susan Flack*
- **Approaches for prioritizing uses of toxic chemicals-** *Susan Flack*
- **Collection of radionuclide effluent data and application of correction factors-** *Joe Shonka*
- **Estimating early plutonium releases from D-Building-** *Joe Shonka*
- **Prioritization of nuclide releases-** *Joe Shonka*

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Prioritizing Chemical Releases

- **Identify the materials that were used at LANL.**
- **Classify the materials in terms of their toxicity.**
- **Determine if quantities present were sufficient to pose an off-site health risk.**
- **Evaluate the potential for off-site transport and exposure.**
- **Determine overall priority for each material.**

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Information Sources for Chemicals

- **Historical operations documents, such as**
 - **H-Division reports 1943-67**
 - **X-Division reports 1944-45**
- **Recent environmental measurements (1970s-present)**
- **Current chemical inventories (1992-present)**
- **Interviews (data gaps; reality check)**

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Reconstructing Chemical Uses & Releases

- **Types of data typically available**
 - **Room air monitoring data**
 - **Incident reports**
- **Time periods particularly available**
 - **Early years**
 - **Recent years**

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Reconstructing Chemical Uses & Releases

- Areas of information needed include
 - Earlier toxic chemical inventories?
 - Building ventilation rates
- Examples of chemicals we are studying
 - Explosives
 - Chlorinated solvents
 - Beryllium, uranium, other metals

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Two Tasks: Document Review & Prioritization

- Review is *Systematic* - we go thru records one by one identifying relevant information.
- Prioritization is *Directed* - we examine records and assemble data about releases.

The two tasks compliment each other- prioritization indicates where information is needed, and retrieval finds information that assures correct prioritization. Practically, an iterative approach results.

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Prioritization of Radionuclide Releases

- **Purpose of prioritization at this stage**
- **First method used = estimation of dilution volumes required to meet MPCs.**
- **Strengths and limitations of this method**
- **Results for airborne releases**
 - Priority plot over two time spans
 - Comparison to other DOE Pu facilities
- **Results for waterborne releases**

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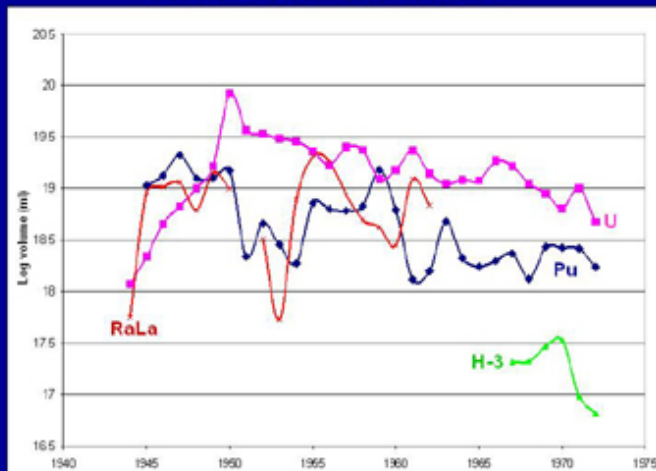
Adjustments to Effluent Data

- **Alpha particle burial in filter paper**
 - Description of the phenomena
 - What we know about the magnitude of effect
 - How we are applying a correction factor
- **Sample line loss-**
 - Description of the phenomena
 - What we know about the magnitude of effect
 - How we are applying a correction factor
- **Magnitude of corrections on release totals**

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Prioritization of Radionuclide Releases

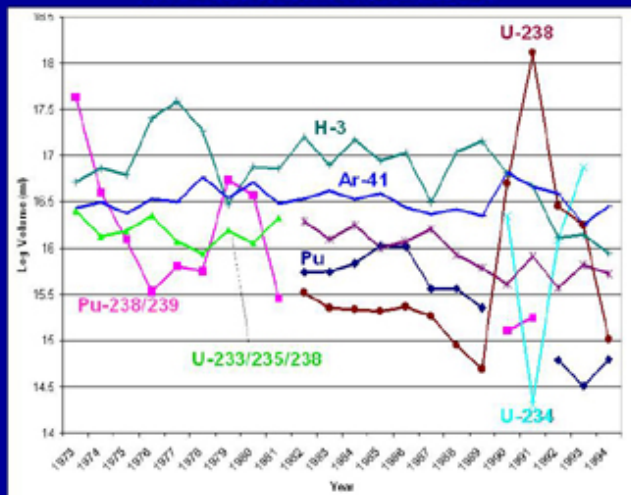
Airborne Releases 1944-1972



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Prioritization of Radionuclide Releases

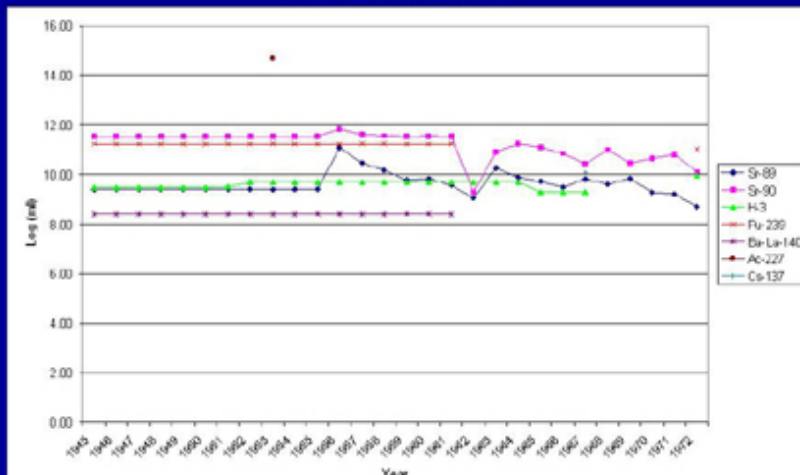
Airborne Releases 1972-1994



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Prioritization of Radionuclide Releases

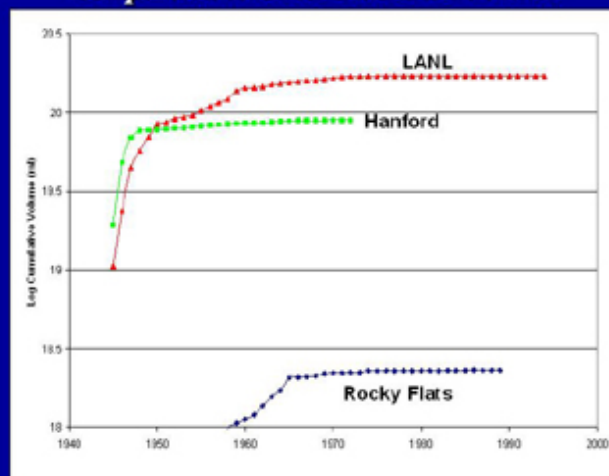
Waterborne Releases



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Prioritization of Radionuclide Releases

Comparison to Other DOE Pu Facilities



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Estimation of D-Building Plutonium Releases



- Effluent measurements have not been found.
- Indoor air concentrations have been found.
- The method for estimating D-Building releases
 - Data that are used (Pu levels, room sizes, flow rates)
 - Key parameters of the model
- Results of the modeling
 - Magnitude of the added releases
 - Key areas of uncertainty

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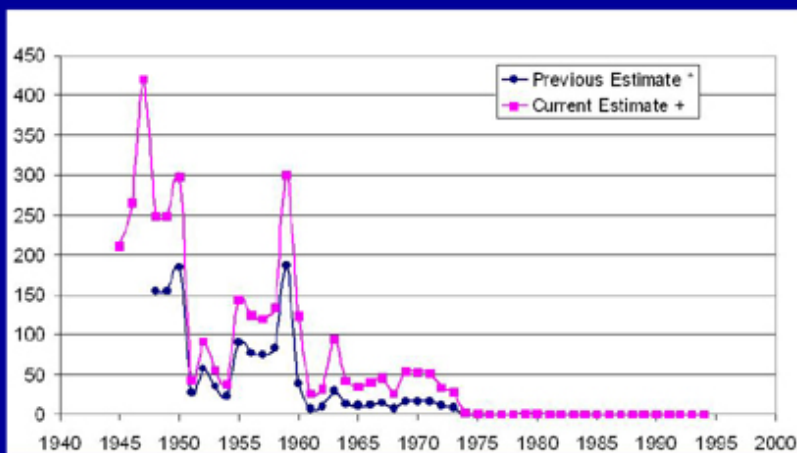
Estimation of D-Building Plutonium Releases

- D-Building Model - Key parameters
 - Concentration
 - Air Exchange Rate
 - “Hood Factor”
- Results of the modeling
 - Magnitude of the added releases
 - Key areas of uncertainty



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Estimated Plutonium Releases (mCi)



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Estimation of D-Building Pu Releases

- **Other possible ways to evaluate plutonium releases and public exposures**
 - **Human tissue analysis program**
 - **Fallout measurements**

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