Information Gathering Under CDC's LAHDRA Project

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Initiation of the LAHDRA Project

In response to requests from elected officials in New Mexico, CDC began exploratory investigations at Los Alamos National Laboratory (LANL) in 1994. These investigations indicated that off-site releases had occurred and large repositories of records existed at the facility, many of which were classified. CDC noted major uncertainties at the time regarding the number of records requiring review at LANL and the extent to which they could be effectively reviewed by outside investigators. CDC awarded a contract that allowed work to begin on the Los Alamos Historical Document Retrieval and Assessment (LAHDRA) project early in 1999, with a focus on identifying the information that is available concerning past releases of radionuclides and chemicals from the government complex at Los Alamos. The stated goals of the LAHDRA project were to:

- retrieve historical documents and evaluate their usefulness for off-site dose assessment,
- declassify (as necessary) relevant documents and release them to the public,
- enter relevant documents into a project information database, and
- develop a prioritized list of contaminant releases from the LANL site.

LAHDRA Document Analysts and Their Access to LANL Site

The individuals who reviewed and evaluated documents were selected because of their education and experience in relevant areas including health physics, human health risk assessment, environmental health, toxicology, chemistry, industrial hygiene, and nuclear or chemical engineering. The team had significant previous experience in document review and dose reconstruction at many of the major MED/AEC sites. A core group of about 15 analysts, most holding Q-level security clearances, worked on the project on a part-time basis.

LAHDRA document analysts had unprecedented access for an independent study team reviewing historical records at Los Alamos. When the project began, analysts with the requisite security clearances had unescorted access to record collections that were being reviewed. As the work progressed, various security incidents at LANL and terrorist attacks against the U.S. led to a significant increase in security restrictions and LANL oversight of analysts' activities.

In the second half of the project, the LAHDRA team was denied access to the following categories of classified information in document repositories at LANL:

- Nuclear weapons design information,
- Information falling under Sigma levels 14 and 15,
- Sensitive Compartmented Information (SCI),
- Special Access Programs (SAPs),
- Foreign Government Information (FGI), and
- Unclassified Sensitive Vendor Proprietary Information.

Key Central Document Repositories

The major elements of the systematic document review effort that was conducted under the LAHDRA project are summarized in Table 1. Brief descriptions of each major document collection that was reviewed follow.

LANL Records Center: The initial and most significant focus of the effort was the LANL Central Records Management Center. The LANL Records Center, shown in Figures 1 and 2, was a 15,000 ft^2 building with approximately 18,000 storage locations. A storage location could be a file cabinet drawer or a unit of shelf space that held a box of documents. While microfilm and microfiche took up relatively little space, they contained a sizable fraction of reviewed documents. The Records Center received and cataloged records from the various LANL groups and divisions and maintained these records in retrievable storage for disposition in accordance with applicable requirements.

Table 1. Summary of LAHDRA Systematic Document Review Efforts at Los Alamos

Location	Approximate Quantities Reviewed	Documents (or Groups of Documents) Selected and Summarized
LANL Records Center	16,896 boxes of documents; 18,000 rolls of microfilm; 31,420 notebooks	2,902
LANL Reports Collection	3,085 classified reports by LANL and 32,000 by others. 12,000 unclassified LANL reports in vault and 25,000 online. 90,000 unclassified reports by other plus 600,000 on microfiche	1,529
ES&H Records Center and satellites	1,197 boxes of documents plus dosimetry and air quality records	333
LANL Archives	1,532 archived collections, with 125,000 folders	992
Litigation Support Database	75,724 documents by title; 3,813 full documents	347
LANSCE Division	10,000 documents by title and 2,500 full documents in Admin. Building; 3,375 documents in Radiological Air Monitoring Archive	43
WEM / WP Divisions	18,876 documents and 1,126 photos in vault; 36 safes containing 7,056 documents	2
Engineering Drawings Center	2,550 drawings on aperture cards plus ~1,000 reels of microfilm	188 and ~1,000 drawings
Environmental Stewardship Division	250,000 documents from the ERSS database, 137 boxes of NEPA/EA records, 12 drawers of EIS documents, ~100 Cultural Resources reports	1,056
Industrial Hygiene & Safety Records	8 lateral file drawers of historical records	17
Former J Division (Field Testing)	699 boxes with approximately 11,000 folders	0

Notes: Document review statistics current as of April 2009. ES&H = Environment, Safety, and Health; LANSCE = Los Alamos Neutron Science Center; WEM = Weapons Engineering and Manufacturing; WEP = Weapons Engineering and Physics; ERSS = Environment & Remediation Support Services; NEPA = National Environmental Policy Act; EA = Environmental Assessment; EIS = Environmental Impact Statement.

Fig. 1. Boxes of documents on shelves in the LANL Records Center in 2005.

Fig. 2. File drawers used for document storage in the LANL Records Center in 2005.

LANL Reports Collection: Since the early 1940s, the LANL Report Collection has served as a repository for technical reports issued by LANL and received from other DOE sites and federal agencies and contractors. There were three types of records in the Report Collection vault: classified reports on paper, unclassified reports on paper, and reports on microfiche. Approximately 12,000 unclassified technical reports issued by LANL with assigned numbers and prefixes such as LA- or LAMS- were located in the Report Collection vault (see Figure 3). Images of approximately 25,000 unclassified technical reports were available in LANL's online library catalog. The unclassified technical reports were available via the Internet without restriction prior to the heightening of security measures following the terrorist attacks of 11 September 2001.

A thorough mapping was completed of the unclassified documents on microfiche at the LANL Report Collection (see Figure 4). Based on that mapping, microfiche cards were assigned to three categories based on the institution of their origin, with each category assigned a review fraction from 100% for reports from DOE or DOE sites to 1% for reports from the Department of Defense, the National Aeronautics and Space Administration, or other U.S. Government organizations, U.S. businesses, or U.S. universities. Foreign reports were not reviewed beyond the mapping analysis.

Fig. 3. Reports on stationary shelving in the LANL Reports Collection vault.

Fig. 4. Microfiche copies of reports are stored in "Lektriever" units such as this in the LANL Report Collection vault.

ES&H Records Center: The Environment, Safety, and Health (ES&H) Records Center was established in 1998 to receive records from the various ES&H Groups, catalog and consolidate those records, and to eventually forward them on to the LANL Central Records Management Center. The ES&H Division also maintained a number of satellite records centers. The materials contained in each satellite center were described and potentially relevant collections from the Industrial Hygiene & Safety, Occurrence Investigation, Radiation Protection, Air Quality, Water Quality, and Ecology groups were documented for future follow up. Incident files from the dosimetry records collection and effluent records from the air quality group were reviewed by LAHDRA analysts.

LANL Archives: The LANL Archives facility (see Figures 5, 6, and 7) contained records organized in collections and folders that have been identified by LANL personnel as being of particular historical significance and deserving of long term preservation. Folders were selected for review if their titles indicated potential relevance to off-site releases or health effects or if their titles were ambiguous. An additional random sampling of 1% of the folders in the Archives was performed to check the project team's document selection process and the accuracy of the Archives' inventory cataloging systems.

Fig. 5. Moveable shelving units in the LANL Archives in 2005.

Fig. 6. Boxes used to store LANL Archives materials.

Fig. 7. A portion of the motion picture film holdings of the LANL Archives in 2005.

Litigation Support Database: During 2005, LAHDRA analysts reviewed a hardcopy listing of the documents contained in LANL's Legal Counsel Litigation Support Database and selected documents for review. Images of these documents were made available to LAHDRA analysts for review. Documents selected as relevant were printed and re-viewed for public release.

Documents Held by LANL Divisions and Groups

While the reviews of centralized document repositories were completed by 2007, reviews of the document holdings of a number of LANL divisions and groups extended through 2008. The first reviews of division records included the contents of the Weapons Engineering and Manufacturing (WEM) and Weapons Physics (WP) divisions' vault-type room and classified safes within associated offices. At the Los Alamos Neutron Science Center (LANSCE) Division, document review focused on office files within the Main Administration Building and the Radiological Air Monitoring Records Archive.

Systematic review of Environmental Stewardship Division records focused primarily on documents that were accessed via the Environment & Remediation Support Services' (ERSS) Lotus Domino® database system. At the Engineering Drawings collection, LAHDRA analysts searched for drawings to support ongoing prioritization efforts for early LANL facilities. The focus was on drawings of buildings and equipment from the original Technical Area, Omega Site reactor facilities and associated stacks, DP Site (TA-21) facilities and ventilation systems, and the Los Alamos townsite. Project management records generated before the 1970s were also reviewed in the Engineering Drawings facility.

During 2007 and 2008, project team members also met with representatives of the following other LANL divisions and groups to inquire about their activities and any records they held:

- Associate Directorate for Security and Safeguards
- Chemistry
- Dynamic and Energetic Materials
- Earth and Environmental Science
- Environmental Protection
- Hydrodynamic Experiments
- Industrial Hygiene and Safety
- Materials Science and Technology
- Plutonium Manufacturing and Technology
- Radiation Protection
- Weapons Component Manufacturing
- Weapons Engineering Technology

Document Selection and Categorization

Each document or group of documents selected as relevant was assigned to one of three categories.

- Category 1 documents contain information that a competent scientist would use in estimating off-site releases or their health effects from operations at LANL or other LANL-sponsored operations within the State of New Mexico.
- Category 2 documents contain supporting information that could be useful in *confirming* estimated release quantities or health effects from operations at LANL or other LANL-sponsored operations within New Mexico.
- Category 3 documents are those that could be used to estimate or confirm off-site releases or health effects from nuclear weapons complex sites outside of New Mexico or from operations sponsored by groups other than LANL at non-LANL sites within New Mexico.

Copies were requested of nearly all Category 1 documents and many Category 2 documents. Copies were not normally requested of Category 3 documents. Partial copies of documents were sometimes requested when relevant information was a small part of a document or was mixed with information that could not be publicly released. The usual practice for Category 2 and 3 documents was to document their existence, bibliographic information, and location so that they can be retrieved if needed in the future.

Document Summaries

A Document Summary Form (DSF, see Figure 8) was completed for each document or group of documents selected by LAHDRA analysts. DSFs were used to capture bibliographic and project-specific information about relevant documents that were found. The forms contained fields for entry of the following types of information: document title, author name(s), project name, publication date, data time period (start and stop dates), originating organization, Technical Area addressed (geographical area of LANL), document type (box, paper document, electronic file, cabinet, microform, notebook, photo, or drawing), extent to which a copy of the document was acquired (complete, partial, or none), original location of the document, points of contact for the document repository of origin, keywords (selected from generic keywords given on the form or written in by the analyst), abstract (written by the analyst or copied from the document), analyst comments, and date reviewed.

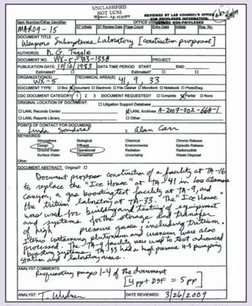

Fig. 8. A completed LAHDRA Document Summary Form (DSF).

Interviews

Interviews of current and retired workers and local residents were conducted to assist in the identification and description of operations possibly associated with off-site releases, identification of relevant collections of records, and development of an understanding of historical operations and development of residential areas. A view of a recent interview is shown in Figure 9. Interview summaries were reviewed for classified information, and the interviewees were offered the opportunity to review the summaries for factual accuracy. Interview summaries were normally included in the project information database.

Fig. 9. A recent interview of a former worker in D-Building and CMR Building.

Processing of Documents for Public Release

Each requested document, regardless of classification markings and accompanied by its DSF, was processed by LANL personnel and subcontractors through reviews for classified information, information protected under the Privacy Act, proprietary information, and information that was legally privileged. After each document was cleared for public release, an additional copy was made by LANL personnel and sent to the project team. The length of time between when the LAHDRA team requested a copy of a document and when that copy was received ranged from a month or two to several years.

The LAHDRA Document Collection and Project Information Database

Paper copies of all documents received from LANL were maintained by the project team and an additional set was sent to a government document reading room at the Zimmerman Library at the University of New Mexico in Albuquerque, where the documents were made available for public review and copying. After receipt from Los Alamos, each selected document or set of documents was matched to its DSF, assigned a unique and sequential Repository Number, and the bibliographic information from the DSF was entered into a project information database. A database was created with front-end interfaces for entry of the information handwritten on the DSFs and for performing searches on the data. Using the search form, users could search the data from every field on the DSF but not the text of the documents themselves.

As the number of paper copies grew and scanning technology matured, it was decided that a better way to preserve and share the material being collected by the LAHDRA team would be as scanned images. Ultimately, all of the collected documents were scanned and saved as Adobe® Portable Document Format (PDF) files that were indexed and searchable. Some large documents were split into multiple PDF files that were all linked to the assigned unique Repository Number. In 2006, a new user interface and search engine based on X1® technology was put into place. This controlled-access, Internet-based application known as DocSleuth allowed filtered, full text searching of included documents that had been optical-character-recognition processed. Figure 10 shows an image of the DocSleuth search screen.

The LAHDRA DocSleuth database is used widely by the project team across the country and was made available at the Zimmerman Library at the University of New Mexico, public libraries in Los Alamos, Española, and Santa Fe, New Mexico, and to a number of universities, researchers, and other government agencies.

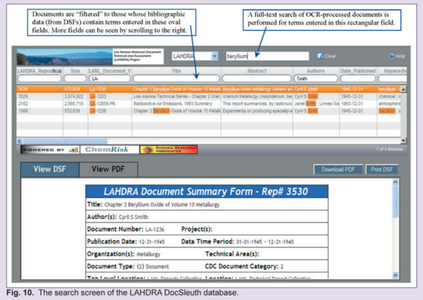

Fig. 10. The search screen of the LAHDRA DocSleuth database.

Summary Statistics for Collected Documents

Over the course of the LAHDRA project, team members reviewed millions of pages of information resulting in the retrieval of approximately 264,000 pages of material relevant to the estimation of offsite releases of chemical or radionuclides from LANL or associated health effects. This information is summarized in the 8,372 records that make up the project's information database.

Tables 2, 3 and 4 show the breakdowns of documents reviewed by the LAHDRA project team by document category, by where the documents were found, and by decade of publication.

Table 2. Breakdown of LAHDRA Documents by Assigned Category

Document Category	Fraction
Category 1: information directly applicable to estimation of offsite releases or health effects from LANL operations within New Mexico.	44%
Category 2: supporting or confirming information useful in estimation of offsite releases or health effects from LANL operations within New Mexico.	46%
Category 3: information relevant to estimation of offsite releases or health effects for other DOE or predecessor agency sites	10%

Table 3. Breakdown of LAHDRA Documents by Location of Origin

Document Location	Fraction
LANL Records Center	37%
LANL Reports Collection	19%
LANL Archives	13%
Domino Database	10%
LANL Research Library	5%
Litigation Support Database	4%
ES&H Records Center	3%
Engineering Drawings Facility	2%
All other locations	6%

Table 4. Breakdown of LAHDRA Documents by Publication Date

Decade of Publication	Fraction
1940s	14%
1950s	16%
1960s	17%
1970s	20%
1980s	14%
1990s	16%
2000s	2%
Unknown	0.1%

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