Chapter 3: Information Gathering at Los Alamos

The goal of the information gathering process at Los Alamos was to identify and retrieve information relevant to off-site releases of chemicals or radionuclides, or potential health effects, associated with LANL-sponsored activities within the State of New Mexico. Information gathering began with a focus on centralized records repositories, then progressed to records held by individual groups or divisions. The latter were selected on a prioritized basis, that is, those most likely to include information of interest.

Fig. 3-1. Two LAHDRA analysts review records at Los Alamos

The principal method employed for information gathering at Los Alamos was what is known as systematic document review (or searching). Systematic searching involves identifying the document collections that exist at a site or facility, both classified and unclassified, then progressing through those collections in an appropriate and orderly fashion until all potentially relevant documents have been reviewed. All reviews were conducted by analysts qualified to recognize information that a competent scientist would use to evaluate historical releases and/or the potential for off-site health hazards. This approach best supports the "leave no stone unturned" goal that best fosters public credibility in public dose reconstruction studies. Systematic document searching can be contrasted with "directed" document searching, where researchers have identified needs for specific types of information and go directly to the document locations or particular types of documents believed most likely to contain it. Systematic searching, directed searching, and combinations of the two approaches have been applied in dose reconstruction studies in the U.S. over the past 15 years.

Some quasi-directed searching activities were conducted at Los Alamos as the information gathering process progressed. These consisted of re-visiting records collections that had been searched earlier in the project to capitalize on information that had been garnered from the initial searches. These subsequent search activities were not entirely directed in nature, as they still maintained characteristics of systematic searching. However, they were not entirely systematic either, as they had a narrower focus than the initial search activities. Another practice employed by the project team was focused systematic searching, in which subsets of records within a given collection were identified based on some defined criteria. These subsets were then subjected to systematic search.

Throughout this section the words “record” or “document” are used to describe a number of different types of information. In this context, records or documents are not limited to physical documents, but also include materials such as electronic databases of information, microfiche records, microfilm records, photographs, video, audio recordings, and engineering drawings. In addition to physical records, other sources of information explored by the project team included interviews with past and current LANL staff members and tours of LANL facilities.

How Documents were Categorized, Summarized and Catalogued

When a document relevant to off-site releases or health effects was identified by a LAHDRA analyst, a Document Summary Form (DSF) was completed. The DSF provided a bibliographic summary of the document and included information on where it was located so it could be retrieved again in the future if needed. Copies were requested of documents that were clearly relevant to the estimation of offsite releases or health effects. For other documents, such as those that contained supporting information or were otherwise not directly applicable, copies were sometimes, but not always requested. A DSF was completed for all relevant documents regardless of whether a copy was requested from LANL.

Copies of documents requested by the project team, as well as all DSFs completed at Los Alamos, were required to go through a review process before they could be released. All DSFs and documents were reviewed by LANL to ensure they contained no classified information, personal information that was protected under the Privacy Act or information that was proprietary or legally privileged. If a document had been deemed Official Use Only (OUO) by its originator, the review process expanded further to include an effort to contact the originating author or organization and have the OUO designation removed. In all but a few cases this was accomplished and the documents were released to the public. One aim of the LAHDRA project was to place all of the material retrieved from Los Alamos in the public domain. However, there were a few cases where OUO restrictions could not be removed from documents desired by the project team. In these instances the documents were provided to the project team for its use, subject to appropriate controls for OUO material.

After receipt from Los Alamos, each DSF and associated document (if any) was assigned a LAHDRA Repository Number, and the information from the DSF was entered into a project information database. The database fields reflected those from the DSF. The Repository Number was simply a sequential number used for indexing the database entries. Documents were scanned to Portable Document Format (PDF) files and indexed using Optical Character Recognition (OCR) software to provide a full-text searchable electronic version. The PDF files were linked to each database record so a user could access the document associated with an entry.

The project information database, which will be described later, was provided to a limited number of public libraries in the northern New Mexico and Albuquerque. It was updated periodically as information was added. In addition, copies of documents retrieved from Los Alamos were made available to members of the public at the Zimmerman Library at the University of New Mexico in Albuquerque.

The LAHDRA Document Summary Form

The DSF was revised several times during the information gathering process. A copy of the latest version, Revision 7, is shown in Fig. 3-2. Most of the entries on the DSF are self-explanatory. However, two that are of particular interest are described here for completeness.

Item Number/Other Identifier

This field was added later in the project to be used in conjunction with creation of the Document Request Log, which will be described later. A separate log was created for each document collection being searched. For each log sheet, entries were given a sequential item number. The item number was entered on the corresponding DSF so it and any associated copies could be tracked through the review process. The item number allowed copies of documents to be readily associated with the corresponding DSF if the two became separated.

CDC Document Category

Analysts selected one of three categories for a document using the criteria below:

Category 1. Documents 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 (such as the Trinity test). Examples of Category 1 documents include effluent monitoring data, accident reports with estimates of releases, release point information, or results of environmental monitoring performed near locations where people lived or recreated.

Category 2. Documents that contained supporting or confirming information that could be useful in estimation of off-site releases or health effects from operations at LANL or other LANL-sponsored operations within the State of New Mexico. Examples of Category 2 documents included historical descriptions of site activities, notebooks for relevant operations, or process flow sheets.

Category 3. Documents 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 (such as Sandia National Laboratory).

Item Number/Other Identifier	OFFICE USE ONLY					
	S7 Initials	S7 Review Date	Page Count	Entry Date	Initials	Rep. No.

DOCUMENT TITLE

AUTHOR(S)

DOCUMENT NO. | PROJECT

PUBLICATION DATE: _____ Estimated? ☐

DATA TIME PERIOD: START _____ END _____ Estimated? ☐ ☐

ORGANIZATION(S) | TECHNICAL AREA(S)

DOCUMENT TYPE: ☐ Box ☐ Document ☐ Electronic ☐ File Cabinet ☐ Microform ☐ Notebook ☐ Photo/Dwg.

CDC DOCUMENT CATEGORY: 1 2 3 DOCUMENT REQUESTED? ☐ Complete ☐ Partial ☐ None

ORIGINAL LOCATION OF DOCUMENT: ☐ Litigation Support Database _____

☐ LANL Records Center _____ ☐ LANL Archives _____

☐ LANL Reports Library _____ ☐ Other _____

POINTS OF CONTACT FOR DOCUMENT

1. 2.

KEYWORDS:

Atmosphere	Biological	Chemical	Chronic Release
Design	Effluent	Environmental	Episodic Release
Ground Water	Operational	Radiation	Radionuclide
Surface Water	Terrestrial	Uncertainty	Waste Disposal

Other:

DOCUMENT ABSTRACT: Original? ☐

ANALYST COMMENTS

ANALYST: | DATE REVIEWED:

Fig. 3-2. The LAHDRA Document Summary Form (DSF)

In contrast, documents about activities by LANL personnel that occurred beyond LANL's boundaries but within New Mexico (such as the Trinity test) would fall under Category 1 or 2. Documents concerning operations at foreign nuclear weapon sites or nuclear power plants (foreign or domestic) were not Category 3 material since such activities were not within the responsibility of the U.S. Department of Energy or its predecessor agencies. In general, copies were not requested for Category 3 documents, but there were cases where copies of Category 3 material were obtained.

Table 3-1 provides a summary of how documents were categorized based on the location and sponsorship of the activity they described. A document could only be assigned one category number.

Table 3-1: Assignment of Document Category Based on Activity Sponsor and Location

Activity's Sponsor	**Location of Activity**		
	At LANL	Within New Mexico but not at LANL	Weapons Complex Site Outside of New Mexico
LANL	Category 1 or 2	Category 1 or 2	Category 3
Others	Category 1 or 2	Category 3	Category 3

The Document Request Log

Toward the later stages of the project, the information gathering process was augmented to include the use of a log sheet called the document request log. Its purpose was to record information about each DSF and any associated document copies generated or requested by the project team. Individual log sheets were used for each specific LANL records facility or collection where review activities were performed.

The document request log provided a formal record of material requested by the project team. It was used to track items (DSFs and documents) from the time they were requested until they were received. The request log became necessary because of significant delays that would sometimes occur between request and receipt. In some cases material would get lost in the review process, so the request log provided a means for identifying and retrieving missing material.

A separate request log was created for each document collection or facility being searched. Each entry on a given log was assigned a unique item number. Item numbers were used as a reference when tracking the progress of material through the review process and for associating documents with DSFs in cases where they were not reviewed together. The fields on the log sheets varied somewhat depending on the records facility where they were used, but they all included fields for the document title, page count, location, accession numbers or other identifiers, and so forth. A request log entry was made for each DSF

regardless of whether the underlying document was copied so there was a complete record of everything the project team identified as relevant within a given document collection. The request log also included fields for use by the classification reviewers to indicate they had reviewed each document, and whether it had been declassified, redacted, etc.

The Project Information Database

As they were received from LANL, the bibliographic information from each DSF was entered into a Microsoft® Access database created for that purpose. The basic structure of the database was defined by the CDC at the outset of the project. As each DSF was entered into the database it was assigned a unique Repository Number. A Repository Number was simply a sequential number used for reference and indexing. Following data entry, the DSFs and associated documents were filed by Repository Number.

As the size of the document collection grew and scanning technology matured, a decision was made to scan all of the documents received from LANL to PDF files. OCR software was used to create a full-text searchable image, within the constraints of the image quality of the original. The OCR process is not 100% reliable given the poor quality of some of the documents.

Fig. 3-3 depicts the progression of a document from a handwritten DSF through entry of the DSF information into the information database and the creation of a searchable PDF image file.

The project database, including the searchable image files, was made available to the public at three regional libraries within New Mexico: the Zimmerman Library at the University of New Mexico in Albuquerque, the Mesa Public Library in Los Alamos, and the Northern New Mexico Community College library in Española. Users may search the bibliographic information from the DSFs and perform full-text searches of the document images. As mentioned above, the OCR process can miss words or text in poor quality originals, so it is recommended that users utilize both full-text searches and searches of the DSF information (i.e., fielded or filtered searches) to find information of interest.

In addition to the Access-based database, the project team developed a Web-based application that is a versatile searching tool for the database and scanned documents. The application, called DocSleuth, is hosted by ChemRisk and is available over the Internet to project team members and other selected individuals. DocSleuth employs sophisticated indexing technology to a flat-fielded version of the project database. The database was re-indexed periodically as information was added. DocSleuth allows global or fielded searches, or combinations of these, and provides a comprehensive tool for garnering information from the large collection of material retrieved from Los Alamos. An image of the DocSleuth search screen in presented in Fig. 3-4.

Los Alamos Document Summary Form | Document Requested: ☐ Complete ☐ Partial ☐ None

DOCUMENT TITLE: Facts about Los Alamos Scientific Laboratory of the University of California

DOCUMENT NUMBER: none | PROJECT:

AUTHOR (S): not identified.

PUBLICATION DATE: October 1964 | DATA TIME PERIOD: start: _____ stop: _____

ORGANIZATION: | TECHNICAL AREA:

CDC DOCUMENT CATEGORY: (1) 2 3 | DOCUMENT TYPE: ☐ Box ☐ Document ☐ Computer file ☐ File cabinet ☐ Interview ☒ Microfilm ☐ Notebook

ORIGINAL LOCATION OF DOCUMENT: ☐ Online _____
☐ LANL Research Library ☐ LANL Reports Collection ☐ ESH Records Center _____
☒ LANL ARC _____ ☐ LANL Archives _____ ☐ Other _____

POINTS OF CONTACT FOR DOCUMENT:
1. Roger Meade 2. Chris C'de Baca

KEYWORDS: (circle or write in)

Atmosphere	Biological	Chemical	Chronic Release
Design	Effluent	Environmental	Episodic Release
Ground Water	Operational	Radiation	Radionuclide
Surface Water	Terrestrial	Uncertainty	Waste Disposal

Other _____

Document Abstract: Original ☐

Provides summaries of research and development programs at LASL, including weapons development and testing, Rover, plasma thermocouple, Project Sherwood, reactors, critical assemblies, theoretical physics and mathematics, Vela Program, accelerators, explosives research, health research, chemistry & metallurgy research, and cryogenics. Includes a chronology of LASL "firsts" from 1943 to 1964. Includes some historical facts about LASL and the Los Alamos community.

ANALYST'S COMMENTS ON DOCUMENT'S RELEVANCE TO DOSE RECONSTRUCTION.
Useful historical background, employment levels, housing details.

ANALYST: T-E. Widner | DATE REVIEWED: 12/3/2003

S7 Reviewer Initials: | S7 Review Date: | Page Count:

Internal Use Only

Repository#: 4048 | Date Entered into Database: 12/4/03 | Signature:

REV 5: 2/7/03 Los Alamos Historical Documents Retrieval and Assessment Project

LAHDRA Document Summary Form - Rep# 4048

Title: Facts About Los Alamos Scientific Laboratory of the University of California

Author(s):

Document Number: | **Project(s):**

Publication Date: 10-31-1964 | **Data Time Period:** 01-01-1964 - 10-31-1964

Organization(s): | **Technical Area(s):**

Document Type: (2) Document | **CDC Document Category:** 1

Top Level Location: LANL RC | **Location:** Unknown

Keywords: operational

Document Abstract: Provides summaries of research and development programs at LASL, including weapons development and testing, Rover, plasma thermocouple, Project Sherwood, reactors, critical assemblies, theoretical physics and mathematics, Vela program, accelerators, explosives research, health research, chemistry and metallurgy research, and cryogenics. Includes a chronology of LASL "firsts" from 1943 to 1964. Includes some historical facts about LASL and the Los Alamos community.

Analyst Comments: Useful historical background, employment levels, housing details.

Analyst: Thomas Widner | **Date Reviewed:** 12-03-2003

Date Entered: 12-04-2003 | **How Much on File?:** C

Los Alamos Historical Document Retrieval

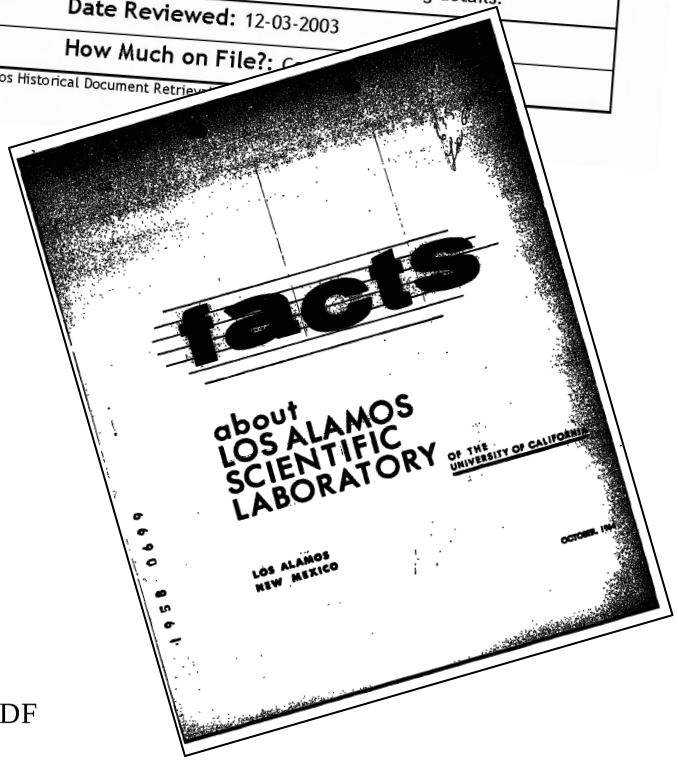

Fig. 3-3. Original DSF, DSF printed from DocSleuth, Original Document PDF

Documents are "filtered" to those whose bibliographic data (from DSFs) contain terms entered in these oval fields. More fields can be seen by scrolling to the right.

A full-text search of OCR-processed documents is performed for terms entered in this rectangular field.

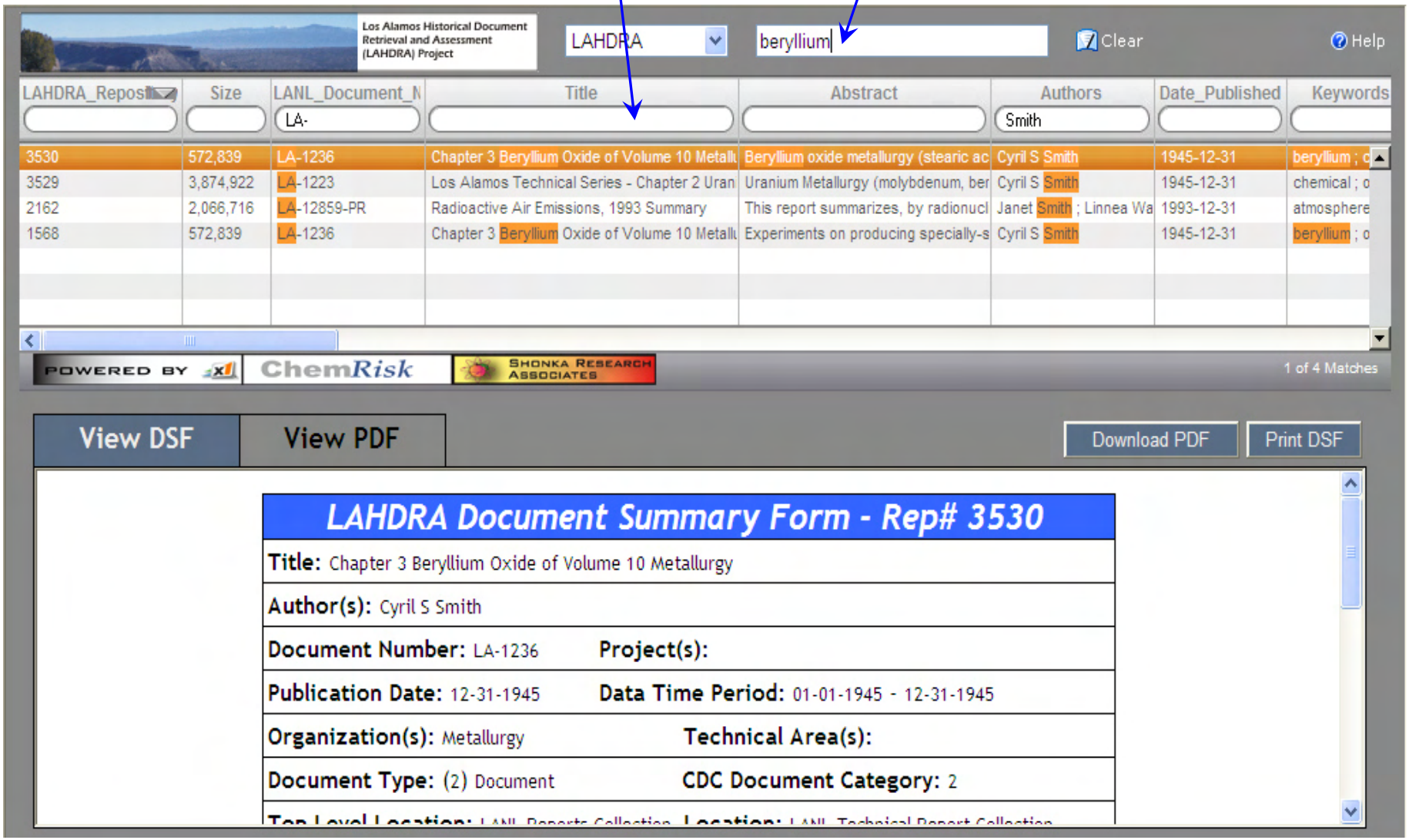

Fig. 3-4. The Search Screen of the LAHDRA DocSleuth Database

Public Reading Room for Documents Obtained by the Project Team

The LAHDRA document repository contains paper copies of documents obtained from LANL by the project team. As of this writing, the repository contains an estimated 264,000 pages of documents, filed under 8,370 Repository Numbers. A duplicate set of the documents is available at the Zimmerman Library at the University of New Mexico in Albuquerque (Fig. 3-5). This location was selected as the official Public Reading Room for the LAHDRA project.

Fig. 3-5. Dan Barkley of UNM discusses project records at Zimmerman Library in Albuquerque with CDC project staff

The Zimmerman Library is located on the University of New Mexico's main campus. The library's Government Information Department is a regional depository for government documents. Documents can be requested at the information desk, and photocopies can be made at a nominal cost using copiers located in the immediate area.

Directions to the Public Reading Room at the University of New Mexico:

Head east from the Central Avenue exit from I-25. Continuing east on Central Avenue, pass through the signal at University Avenue. UNM will be on the left. The third light after University Avenue will be Stanford Drive. Take a left on Stanford Drive to enter the UNM campus. Take another left at the "T." On the right will be Visitor Parking. After parking, head north and slightly west across campus. Zimmerman Library is just northwest of the Student Union Building. The Government Information Department is located in the basement of the library.

Contact: Dan Barkley, phone: (505) 277-7180; barkley@unm.edu

Restrictions on the Project Team's Access to Certain Categories of Information

Accessing and reviewing documents at Los Alamos National Laboratory has been more difficult than in any similar project conducted at the other DOE sites that have been subjects of dose reconstruction investigations. The LAHDRA project was impacted by several events at LANL, unrelated to LAHDRA activities, that resulted in stand downs of Laboratory operations and the subsequent implementation of increasingly restrictive security measures. Initially, these developments severely impeded the team's

ability to complete its review, but over time solutions were put in place that allowed the team to complete its work in concert with increased information security measures.

When the project began, project team members that held the requisite levels of security clearance were not restricted in their access to classified information in support of systematic search activities. However, a few years into the project, following some highly-publicized information security issues at LANL and a stand down of its operations, the Laboratory enacted new security practices that encumbered the project team's access to classified documents. These new security practices included denying the project team access to specific types of information (discussed below) and requiring analysts to have permission from document owners before being allowed to review classified information. The latter constraint was a particular problem, especially in the classified reports collection, where many reports were issued by organizations other than LANL, many of which no longer existed. In an effort to accommodate this requirement, LANL requested that project team members review reports by their title alone. However, this was problematic because in many cases document titles are not a reliable means of identifying relevant content. Then, at one stage, the Lab determined it was not authorized to grant the project team "need to know" for documents issued by organizations other than LANL. This was a reversal from how LANL staff had been operating up until that time. Additional impediments were stricter limits on the number of project team members that could work in a given location at one time, and the requirement that documents be pre-screened for "deniable category information" before team members could review them. This presented two constraints. First, the requirement for pre-screening meant the project team could only work as fast the contractor LANL hired to do the screening. Second, the presence of the screeners counted against the total number of people the project team could have working in a given area.

In February of 2005; after a number of iterations between DOE, LANL, CDC, and the project team; a number of the security restrictions that had been preventing the project team from conducting systematic review activities were relaxed. This left the excluded categories of information and the associated requirement for pre-screening in place as the mechanism for addressing concerns over "need to know" issues that had been raised during internal and external reviews of LANL's security practices.

Table 3-2 below summarizes the categories of information to which project team members were denied access. These restrictions meant classified information to be reviewed by the project team first had to be reviewed by an authorized individual to ensure that no deniable information was present. If deniable information was present, a general description of the contents was provided, to the extent practical, to allow the project team to make a judgment as to whether the material potentially contained relevant information. In general this proved to be a workable, though time-consuming, solution. In the event the

project team felt denied documents could contain relevant information, a process was available where an appropriately-cleared CDC employee could review the material. The reason for the distinction between CDC employees and its contractor (the project team) was unclear, since all of the pre-screening of classified material was performed by subcontractors hired by LANL.

Table 3-2. Categories of Information Withheld from the LAHDRA Team by LANL

Nuclear Weapons Design Information– documents relating to nuclear weapon design, such as weapon component blue prints, drawings, or other schematic or graphical design information.

Sigma 14 Information– concerns the vulnerability of nuclear weapons to deliberate, unauthorized nuclear detonation.

Sigma 15 Information– concerns the design and function of nuclear weapons use control systems, features, and their components. This includes use control information for passive and active systems.

Sensitive Compartmented Information (SCI)– includes information that has been determined pursuant to Executive Order 12958 or any predecessor order to require protection against unauthorized disclosure and that is so designated. Includes conventional weapons, security systems, foreign relations, and information regarding intelligence sources and methods.

Special Access Program (SAP) Information– deals with programs that are judged to require access limitation beyond that of the three-tiered classification system (Confidential, Secret, and Top Secret). These include programs within the Departments of Energy, Defense, and State. For example, the Congressional Emergency Relocation Site located under the Greenbriar Hotel in West Virginia, built to house Congress and key staff in the event of a national emergency, was designed, constructed, and maintained as a SAP for over 30 years until declassified in 1994.

Foreign Government Information (FGI)– includes information provided to the U. S. Government by a foreign government or governments, an international organization of government, or any element thereof, with the expectation that the information, the source of the information, or both, are to be held in confidence.

Unclassified Sensitive Vendor Proprietary Information– includes information that is deemed sensitive unclassified and touches on areas such as trade secrets and privileged or confidential commercial or financial information.

Summary of Information Gathering Activities for Specific Document Collections

Document review activities began with an emphasis on the large, centralized records repositories at LANL. It then progressed to include records held within specific divisions or groups. Systematic searching was the predominant method used for all information gathering activities at LANL. For the larger, centralized repositories, systematic search activities generally occurred over multiple stages. After an initial systematic review, follow-up review activities were performed as needed to evaluate information accessioned since the initial review was completed.

Centralized Repositories

The LANL Records Center

A principal focus of the information gathering task at Los Alamos was the LANL Records Center. Initially this facility was housed in Building 1001 in Technical Area 21 (TA-21-1001). Later in the project the Records Center was relocated to the National Security Sciences Building (NSSB). The project team performed records review activities in both locations. In addition to the Records Center, the LANL Archives was also housed in Building TA-21-1001 until the time it too was relocated to the NSSB. The Archives collection was stored, maintained, and managed separately from the Records Center's holdings, and review of that facility was conducted separately from that for the Records Center. The systematic review of the Archives is discussed later in this chapter.

The original LANL Records Center was a 15,000 square foot building located at 180 6th Street in Los Alamos. The function of the Records Center is to receive and catalog records from the various LANL groups and divisions, place and maintain them in retrievable storage, and disposition them in accordance with DOE retention and disposition guidelines and other associated requirements (such as the moratorium on destruction of records deemed pertinent to epidemiological studies).

Building TA-21-1001 (the original Records Center) was sub-divided into six "bays" denoted A through F. It also included a seventh bay, denoted G-Bay, located in a separate building (TA-21-1002) behind the primary facility. The primary facility, Building TA-21-1001, was a designated Vault-Type Room, and included classified holdings. The records stored in G-Bay were considered unclassified for access control purposes. The Records Center holdings were stored in bays B, C, E, F, and G. Each bay contained a number of rows consisting of either tall (10-drawer) filing cabinets or shelving. Shelving and file drawers from the original Records Center are shown in Fig. 3-6 through Fig. 3-9. The file drawers were used primarily to store paper records. The shelving was used to hold records contained in standard, one cubic foot storage boxes. There were also a number of mobile storage units used to house media such as microfiche and microfilm. Fig. 3-10 and Fig. 3-11 show storage and review of microfilm records in the original Records Center. Each bay typically contained a mix of different types (formats) of records and records storage media/containers. For example, the tops of the rows of file cabinets were used to store boxes and large-sized media such as drawings and blueprints.

Fig. 3-6. Boxes of documents on shelves in the LANL Records Center in 2005

Fig. 3-7. Document review in the LANL Records Center

Fig. 3-8. File drawers used for document storage in the LANL Records Center in 2005

Fig. 3-9. Review of notebooks in a Records Center drawer

Fig. 3-10. One of numerous drawers of microfilm in the LANL Records Center in 2005

Fig. 3-11. Review of microfilm in the LANL Records Center in 2005

All material accessioned by the LANL Records Center is assigned a Transfer Record (TR) Number. TR Numbers are assigned sequentially and are the principal means of identifying, locating, and tracking material in the center. Locations of records in the original Records Center were referenced using a "bay-row-shelf" nomenclature, where "shelf" could have been any number of storage locations, such as a file drawer or a specific box in a vertical stack of boxes. Thus, the location "B-1-2" would refer to material location in B-Bay, Row 1, Location 2.

The LANL Records Center had been operating near its storage capacity for some time, and the space shortage resulted in records frequently being relocated, reconsolidated, transferred to Federal Records Centers, or otherwise dispositioned to free up space to accommodate newly-accessioned material. In 2005 the Records Center began the process of relocating to the NSSB. Many of the records were relocated to the NSSB, and many others were transferred to Federal Records Centers.

The layout of the Records Center in the NSSB is similar to that in the previous facility, though without the individual bays. Otherwise, the storage system is similar, and in fact the file drawer storage units were physically moved from the old facility to the new one.

The systematic search of the Records Center may be described as having occurred in four distinct phases: initial search activities (up to the work stoppage in 2003 prompted by security issues at the Lab), an interim period, resumption of systematic search activities following the work stoppage, and follow-up review activities after the Records Center was relocated to the NSSB.

Initial Systematic Searches of the Records Center: February 1999 – October 2003– The initial systematic search for relevant material in the LANL Records Center began in February of 1999 and continued until October of 2003. To facilitate identification of what had and had not been reviewed, records were marked with one of two rubber stamps. One stamp was used to identify records that contain no information pertinent to off-site releases or health effects (Fig. 3-12):

✓CDC/NCEH
REVIEWED
(in green ink)

The other stamp was used to identify boxes or drawers that did contain relevant information, that is at least one document deemed to be Category 1, 2, or 3 (Fig. 3-13):

★ CDC/NCEH ★
DO NOT DESTROY
(in red ink)

Fig. 3-12. A Records Center drawer with a green "CDC Reviewed" stamp affixed

Fig. 3-13. A Records Center box marked with red "Do Not Destroy" stamps

For records stored in boxes, the outside of the box was stamped. For records stored in drawers, an adhesive label was stamped and affixed to the drawer. Originally a log entry was made identifying everything that was reviewed. These logs, referred to as "box logs", included the document category assigned to the material (i.e., Category 1, 2, 3, or 4), its TR Number, location, the analyst that performed the review, and the review date. This information was recorded for all material, regardless of whether it contained relevant information. If material was selected for copying, an additional entry was made in a separate log identifying the material by its TR Number and location. The purpose of this "review log" as it was known was to provide the classification reviewers a current listing of what they needed to review and to aide them in locating it. This "review log" was a predecessor to the formal document request log initiated later in the project. Material to be copied was flagged using self-stick notes or equivalent to make it easier for the classification reviewers or others to find later. Once material was either confirmed to be unclassified or properly redacted, it was copied and forwarded for an additional series of reviews to confirm it could be released to the public. This purpose of this subsequent review was to screen for information that was protected under the Privacy Act, proprietary, attorney-client privileged, etc. The review log served as a tool to both identify material in need of classification review and that which had been forwarded for the second part of the review process or still needed to be copied.

Early in the initial review it became apparent the tools and methods originally specified for tracking progress and identifying material that had and had not been reviewed were inappropriate for a facility like the Records Center. The large volume of the material coupled with its dynamic nature (i.e., high turnover) meant handwritten logs were of little use. Boxes and drawers that had been stamped by the project team were often re-used to store material that had not been reviewed. This meant the presence or lack of one of the stamps was of limited value. Further, the ever-changing number of storage locations and constant in-flux of new material made asserting a completion percentage problematic, and presented a task that was open-ended. Thus, a more reliable method was needed to keep track of the systematic review of the Records Center.

An electronic database of the Record Center's holdings was created to allow tracking of what had and had not been reviewed by TR Numbers. The project team adapted the database used by the Records Center staff to track its holdings. Tables, fields, and LAHDRA-specific search criteria were added as needed, including an electronic version of the box log. The box logs and accession/turnover information provided by the Records Center staff provided the two sources of data used to maintain the database. As long as the database was kept current in terms of records locations and TR Numbers, any discrepancies between it and the handwritten box logs gave an immediate indication of either an error in the log or material that

had been moved or otherwise dispositioned. This greatly simplified the task of tracking material that had and had not been reviewed, even for cases where the same locations required review multiple times because of records turnover.

In conjunction with implementing the database for tracking progress, a cutoff accession date was established to define a fixed end point for the initial systematic review of the Records Center. The cutoff accession date chosen was December 31, 1999. The last Transfer Record assigned prior to this date was TR Number 13779. Thus, material in the Records Center having a TR Number 13779 or less was targeted for review under the initial systematic review. Records accessioned after January 1, 2000 were addressed in subsequent review activities. The cutoff accession date was only applied to hardcopy records.

The database used to manage and track the initial systematic review of the LANL Records Center was not used for microform records (that is, microfilm or microfiche). These materials did not suffer from the turnover problems that hindered the review of the hardcopy records, so the review of the microform records was managed and tracked in a manner more consistent with what was originally conceived. Small red or green adhesive dots were applied to microfilm cassettes in lieu of the rubber stamps to indicate material that had been reviewed. For microfiche records, the rubber stamps were applied to either the sleeve the media was stored in (for individual microfiche records) or to the storage container (such as the front of a drawer) if it was a large volume of records.

Interim Search and Retrieval Activities: September, 2004 to March, 2005– A work stoppage prompted by security issues at LANL halted systematic search activities at Los Alamos in October 2003. A large backlog of material selected by the project team for copying and release to the public had accumulated. An interim task to get this material copied, reviewed, and released began in September of 2004.

A listing of outstanding material from the initial systematic review was compiled so it could be located and placed into the review process. By the end of March, 2005 all of this material had been located and submitted for review. By the middle of May, 2005 all of the outstanding material selected by the project team during its initial review activities in the LANL Records Center was in the project's repository.

In parallel with the task to close out the backlog material during this interim period, a CDC staff member made several trips to the LANL Records Center and the LANL Reports Library to close out some other outstanding items from the initial search activities. Specifically, the review of hardcopy (i.e., non-microform) records at the Records Center and a subset of classified reports in the Reports Library were completed.

Resumption of Systematic Search Activities: February, 2005– Systematic search activities at the LANL Records Center (and for the project as a whole) resumed in February, 2005. Review of hardcopy records accessioned through 1999 had been completed, so the focus upon resumption of systematic searching was completion of the microform records (i.e., microfilm and microfiche). Time was of the essence given the pending relocation of the Records Center to the NSSB.

When work resumed, there were approximately 4,100 cards of microfiche and 2,700 rolls of microfilm in the Records Center remaining to be reviewed. Systematic review of the microfiche was completed by mid-March of 2005. Systematic review of the microfilm (and thus the LANL Records Center itself for the time being) was completed in early June, 2005.

The resumption of systematic review activities saw a significant improvement in throughput over that experienced previously. This was due to a number of important changes that were made to the document review and release process, including analysts being allowed to disposition non-relevant material by title alone and copy relevant documentation as it was identified. Being able to copy the material as it was identified and attach it to the DSF eliminated problems suffered previously with getting copies of what the analysts had selected. Another important, but unfortunately, short-lived change was the near-full-time availability of a contractor to perform the requisite classification reviews that was also authorized to declassify material when appropriate. These changes led to improved throughput of systematic review activities, including short turnaround times between when relevant material was identified and when it was received by the project team. Further, the adoption of the document request log during this time made it easier to confirm that everything the project team had requested was received and to resolve any discrepancies.

Follow-up Reviews in the NSSB– Review of records accessioned after December 31, 1999 took place after the Records Center had completed its relocation to the NSSB. This review was performed by reviewing the information on the individual TRs and identifying records of interest. The scope of this review was limited to records that were stored at LANL, that is, it did not include records that had been transferred to the Federal Records Center.

The LANL Archives

Initially, the LANL Archives was housed primarily in A-Bay of Building TA-21-1001. Some material (motion picture reels, for instance) was housed in B-Bay, and additional material (including some that had not yet been formally accessioned) was stored in G-Bay in Building TA-21-1002. These are where the Archives records were maintained when the project team completed its initial systematic review (with the

exception of film (motion picture) and video records) in early May of 2006. Subsequently, the Archives were relocated to the new National Security Sciences Building in TA-3. Once it was operating in its new location the project team performed follow-up activities there to revisit document collections previously reviewed and to review any records accessioned since the systematic review was completed. The second look at documents previously reviewed was prompted by insights gained from the study of the information from the initial review.

In general, the Archives records were organized into individual folders, which were stored in boxes (see Fig. 3-14 through Fig. 3-17). The boxes and folders were constructed of acid-free paper, making them suitable for archival storage. Most of the boxes were of a clamshell design which allowed easy access to the folders inside. Other types and sizes of boxes were used for some large or odd-sized media, microform records, etc. Some non-paper records were stored in cases or cans on Archives shelves (see Fig. 3-18 and Fig. 3-19).

Archives records were organized into collections, with a collection consisting of records covering a common subject area (e.g., an individual's memoirs, the records of a particular facility or group, etc.). A collection could be one box or span hundreds of boxes. Each collection was assigned a unique collection number, consisting of the year the material was accessioned and a sequential number starting with 001 for each year. Boxes were numbered sequentially within each collection, and folders were numbered sequentially within each box. Each collection had an inventory listing that gave a brief description of the contents of each folder.

The LANL Archives was a largely static, well-organized collection of records. That plus the availability of the inventory listings provided a framework for systematic document searching that did not exist at other centralized repositories. The project team began systematic review of records in the LANL Archives in June of 2005. The first step in the review process was to obtain the inventory listings for each collection. The Archives staff provided these listings to the LANL LAHDRA project office, which broke them up into "Pages." The complete listings were broken up into 52 Pages, with a given Page consisting, generally, of hundreds of pages of inventory. (LANL's choice of "Page" as its nomenclature for the inventory listings tended to be a source of confusion until one became familiar with it. A "Page" of inventory listings covered many different collections and was by no means a single page of information.)

Fig. 3-14. Moveable shelving units in the LANL Archives in 2005

Fig. 3-15. Boxes used to store LANL Archives materials

Fig. 3-16. Boxes used for storage of archived material

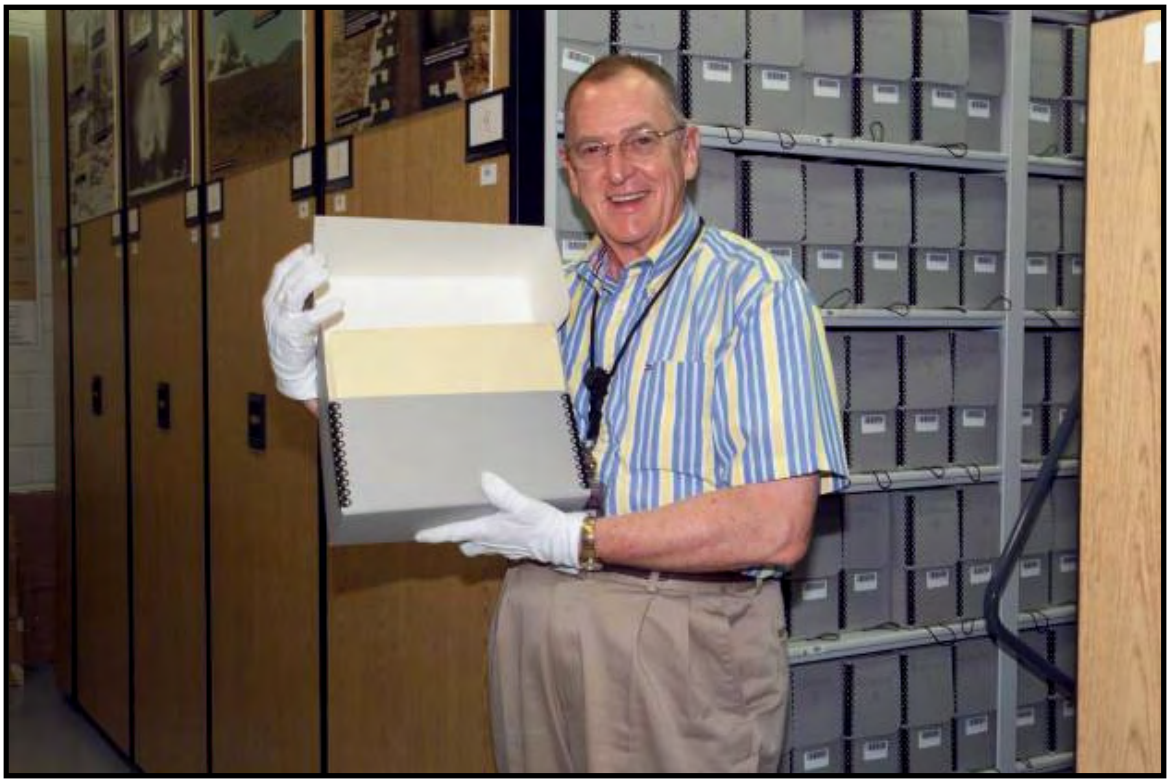

Fig. 3-17. A classification officer preparing to review documents selected by LAHDRA analysts

Fig. 3-18. The LANL Archives contain paper documents, audio tapes, video tapes, and microfilm

Fig. 3-19. The LANL Archives includes classified and unclassified motion picture films and videos

The inventory listings were placed in three ring binders and provided to the project team. Project analysts then went through the listings and selected material for review based on the descriptions given. The detail in the inventory listings allowed this selection process to be performed at the folder level rather than the box level. The selection process was rather broad, as often it was not apparent from the description what the material actually was. In such cases the material was always selected for review. Once this selection process was completed, approximately 28,235 folders had been selected for review. This equated to approximately 25% of the total folders in the Archives at that time.

In addition to the records selected by the project team for review, a random sampling of 1% of the folders in the Archives was also performed. The purpose of this sampling was to select material to be reviewed by the analysts to act as a check on both the project team's document selection process and on the accuracy of the Archives inventory listings. The 1% sampling process did not indicate any problems with the material selection process or the Archives' inventories.

The review of the material selected by the project team, in general, proceeded one page at a time. A set of boxes from a given collection was pulled and each folder selected from within those boxes (either by the analysts or via the random selection process) was reviewed. Once the review was completed, the appropriate stamp (red or green) was applied to the box and the analyst indicated the material had been reviewed by initialing and dating the inventory listing for that folder. This process was continued until the Page was completed. Deviations from this process were made as needed, such as the advance review of excluded material (discussed below) or completing the review for all material in G-Bay (regardless of what Page it was under). In the latter case, a priority was made to complete the review of material stored in G-Bay under favorable weather conditions. G-Bay was a seldom-used facility with limited climate control, so both LANL and the project team wanted these reviews completed after the summer and before the winter. Review of Archives material in G-Bay (including that not yet accessioned) was completed around the middle of October, 2005.

Prior to review by the project team, all of the material selected (either directly or through random sampling) had to be pre-screened for excluded categories of information by authorized individuals. For the Archives, information determined to be excluded by LANL's reviewers was dispositioned by an interactive discussion between the reviewer and a project analyst. (Information was excluded at the folder level.) The reviewer gave the analyst a basic description of the contents of the folder and the reason he felt some of the material should be withheld from detailed review. This process gave the analysts enough information to make an informed decision on the relevance of the material for the LAHDRA project. Little of the material selected for review in the Archives was excluded and none of this material was

thought to contain relevant information. Much of the excluded material came out of the random selection process and was not material selected by the project team. The project team went through and addressed most of the excluded material in advance so it did not impede the progress of the systematic review.

As previously discussed, follow-up review activities were completed for hardcopy Archives records following its relocation to the NSSB. In 2007 the project team was provided a listing, several hundreds of pages in length, of films and video tapes held in the Archives collection. This listing was reviewed during 2007 and 2008 and potentially relevant titles were selected for review. In early 2009, a list of 84 titles was submitted to LANL with a request that they be made available for review. It was determined that there was significant duplication within the list, some of the films were old and brittle, and viewing would be problematic for some of the requested titles, A plan was put in place to review as many as possible during remaining visits to LANL within 2009 as budget permits.

The LANL Reports Collection and Research Library

Initially, the LANL Reports Collection was housed in a vault facility located beneath the LANL Research Library. Along with the Records Center, Archives, and other collections, it too was eventually relocated to the NSSB. However, since this move took place after the project team had completed its systematic review, this section describes the center as it existed prior to being relocated.

The Reports Collection contained both classified and unclassified reports published by LANL and numerous other entities, in paper copy and on microfiche. The Reports Collection maintained its holdings in three principal collections: classified reports, unclassified reports, and unclassified microfiche. The project team's systematic review of the Reports Collection approached each of these three collections individually. Fig. 3-20 through Fig. 3-23 show some of the stationary shelving, movable shelving units, and Lektriever units that were used in the Reports Collection.

As with the other systematic document search activities that began early in the project, initially logs were kept of everything that was reviewed in the Reports Collection regardless of whether it contained relevant information. This practice of formally documenting everything that was reviewed was found to be unnecessary and thus was discontinued when document search activities resumed in February of 2005 following the security stand down. This change, plus that of dispositioning material by title, greatly improved the efficiency of the systematic review of the Reports Collection without compromising its effectiveness.

Fig. 3-20. Reports on stationary shelving in the LANL Reports Collection vault

Fig. 3-21. Reports on moveable shelving in the LANL Reports Collection vault

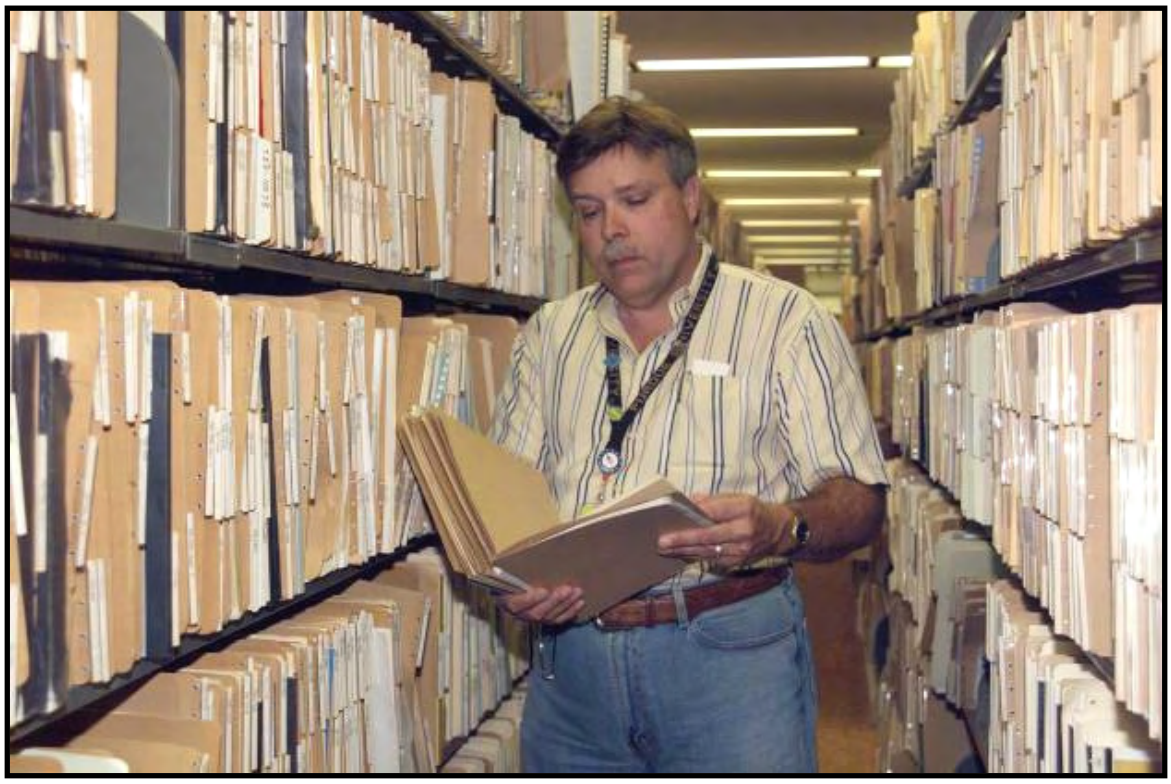

Fig. 3-22. Review of technical reports in the LANL Reports Collection

Fig. 3-23. Microfiche copies of reports are stored in "Lektriever" units such as this in the LANL Report Collection vault

Since there were no complete or reliable finding aides for its holdings, the systematic review of the Reports Collection was performed by reviewing documents shelf by shelf. The largely static nature of the Reports Collection holdings made this an effective procedure.

Review of the Classified Reports Collection– The classified reports collection consisted of reports that were classified at the time of publication. The reports were published by LANL and numerous other entities, including other weapons complex sites, military organizations, and contractors. The majority of the reports pertained to weapons program activities (testing in particular) and other large defense programs, such as Rover. The reports published by LANL included those in the LA-series and reports generated by various groups such as SS (material accountability), W-division, X-division, etc. The reports were stored on collapsible shelving in alphabetical order.

The classified reports collection included approximately 3,000 classified report titles issued by LANL as LA- or LAMS- reports. Quantities are reported as titles rather than as individual documents since there can be multiple copies of a given report in the collection. In addition, the classified reports collection contained approximately 32,000 titles from organizations such as other weapons complex sites, other defense-related agencies, academic institutions, and private corporations that conducted research on behalf of DOE or its predecessor agencies.

To address the issue of excluded material, ultimately classified reports were reviewed by a LAHDRA analyst working in tandem with a reviewer authorized by LANL to pre-screen material for excluded information. This arrangement worked well, and the systematic review of the classified reports collection was completed in June of 2005. Additional ad hoc reviews of some of the holdings in the classified reports collection were subsequently performed to follow-up on information learned from the earlier reviews.

Review of the Unclassified Reports Collection– The unclassified reports collection was similar to the classified collection, but contained only unclassified documents. As such, the subject areas covered were more broad than those in the classified reports and tended to yield more material of interest to the LAHDRA project.

The Reports Collection contained approximately 10,000 unclassified report titles issued by LANL as LA- or LAMS- reports. In addition, images of approximately 25,000 unclassified LA-, LA-MS-, LA-UR, and LA-PR reports were available as PDF files in the LANL electronic library catalog. Unclassified reports with limited distribution categories, such as OUO (Official Use Only), were not available electronically and had to be reviewed in the vault.

Prior to the heightening of security measures that followed the terrorist attacks of September 11, 2001, the unclassified "LA" reports were available to the public on LANL's web site. Subsequently, those files could only be accessed from a computer with a LANL IP address or by certain other government computer users. The project team reviewed 100% of the unclassified "LA" reports that were formerly available without restriction on the Internet. Most of these reports were reviewed using LANL computers at an office made available to the project team at TA-35.

In addition to those issued by LANL, there were approximately 90,000 unclassified reports in the Report Library vault issued by non-LANL entities, including:

- DOE sites other than LANL,
- academic institutions,
- private corporations that conducted research on behalf of DOE, and
- other defense-related agencies.

Systematic review of the hard copy holdings of the unclassified reports collection was completed in November of 2006.

Review of the Unclassified Microfiche Collection– Historically, LANL subscribed to multiple UC (University of California) distribution codes for DOE-related reports. When the Office of Scientific and Technical Information (OSTI) took over the distribution of DOE-related reports, they began distributing the reports on microfiche instead of paper. As a result, the LANL Reports Collection contained approximately 1.5 million documents on microfiche. In 1999 the LANL Research Library converted to an electronic subscription service, so documents were no longer added to the microfiche collection. Instead, library staff accessed reports via online databases (not hosted by LANL) upon request.

All of the microfiche reports were unclassified, but some were marked for limited distribution. Journals were not included in the microfiche collection due to copyright laws. Many of the reports in the microfiche collection were conference proceedings. The fiche cards were stored in Lektriever™ power filing units in alphabetical order (by document number). The documents in this collection included approximately 22,225 LA reports, according to the Library Catalog. Duplicates of these reports existed between the paper and microfiche collections, so the reports on microfiche did not need to be reviewed again if a paper copy of the same report had already been reviewed. Of the non-LANL agencies represented in the microfiche collection, the three largest (in terms of number of reports) were DOE Energy (~500,000 reports from 1969 to the present), Nuclear Science Abstracts (NSA; ~100,000 reports from 1949 through 1976) and NASA (~20,000 reports).

The Research Library subscribed to two electronic databases, DOE Energy and NSA, and had until recently also subscribed to the NASA electronic database. A search of the DOE Energy and NSA databases showed that Los Alamos was the authoring institution for approximately 11,000 NSA reports and 53,000 DOE Energy reports, or about 10% of the titles in each database.

Like the other collections in the LANL Reports Library, there was no complete finding aide available to allow searching the microfiche collection. The project team and LANL staff members therefore performed a cataloging (mapping) of the numerous entities represented in the millions of pages of reports contained in the microfiche collection. This produced an estimate of approximately 600,000 cards of microfiche in the six Lektrievers. The submitting organizations represented in these cards were differentiated into three broad categories to facilitate developing a search plan for this material. For each category of material, a fraction was reviewed for information relevant to the LAHDRA project. The categories of information and their associated review fractions are given in Table 3-3 below.

Table 3-3. Review fractions for categories of unclassified microfiche in the LANL Report Collection

Category	Description	Review Fraction
A	Reports from DOE or DOE sites, LANL-originated reports, and New Mexico-related documents.	100%
B	Reports from DOD, NASA, other U.S. Govt. organizations, U.S. businesses, or U.S. universities.	1%
C	Reports from foreign (non-U.S.) organizations.	None beyond that performed in the mapping process

The decision not to review the material from non-U.S. entities any further was based on the sampling of the documents in the microfiche collection intrinsic to the mapping process. Formal review of the microfiche collection was completed in March of 2006. All relevant material identified from the Lektriever collection was received from LANL and entered into the LAHDRA database. The majority of this material was Category 3 information, i.e., that pertinent to sites other than LANL.

Review of the LANL Research Library– LANL's central research library, in general, did not serve as a central repository for records. However, it did contain some public domain records such as those associated with the "human radiation experiments" initiative and LANL's annual environmental summary reports. The project team searched these collections and retrieved a number of records from them. In particular, a number of Health Division records were obtained from the Research Library, as they were included among documents associated with DOE's human radiation experiments project.

The ES&H Records Center and Other ES&H Records

The initial systematic reviews of the holdings in the Environment, Safety, and Health (ES&H) Records Center were completed earlier in the LAHDRA project. More recently the holdings of the ES&H Records Center were relocated to the NSSB and housed in the same area as the primary Records Center. After the documents were relocated the project team completed follow-up review activities of those accessioned since the prior review activities were completed. In all, there were three systematic reviews of the holdings of the ES&H Records Center to ensure that material accessioned since the prior review was evaluated.

This summary of document review activities for the ES&H Records Center reflects group and organization names that were in use at the time review activities began. Since that time LANL went through numerous organizational changes, making the group and organization designations below largely obsolete. However, the previous organizational designations have been retained to preserve the summary of the review activities in sufficient detail.

Description of the ES&H Records Center– Prior to its relocation to the NSSB, the ES&H Records Center was located in Building 46 at TA-35. The center began operating in 1998. Its purpose was to receive records from the various ES&H Groups, catalogue and consolidate them, and eventually forward them to the LANL Records Center. Many of the records stored at the ES&H Records Center were recent, i.e., from the 1990s forward, but older records were found was well.

In Building TA-35-46, the records were stored in a combination of 25 rows of shelving and 9 file cabinets. The shelving units were used to store standard one cubic foot boxes. The file cabinets were used to store a combination of boxes and other items or containers. Often there would also be numerous boxes staged in various areas of the center that had not yet been accessioned. Some of these un-accessioned records would also be placed in the shelving units.

At the time, contents of records stored at the ES&H Records Center were described on CIC Form 170, the Records Transfer Request Form. This form defined a unique transfer record (TR) number for each set of records submitted to the center. The format of the TR numbers used for materials accessioned by the ES&H Records Center differed from those used by the primary Records Center. The ES&H format was TR-120-xxxx, where “xxxx” was a sequential number. The TR numbers were used to track records in a database maintained for that purpose. Hardcopies of the TR forms were kept in binders, with a different binder used for each group. Following its relocation to the NSSB, the holdings of the ES&H Records Center were stored on collapsible shelving units within the main Records Center.

Other ES&H Records– Some ES&H groups held records that had not yet been sent to the ES&H Records Center or the main Records Center. For example, Group ESH-17 (Air Quality) kept records in file drawers that were organized by year. They kept records for the three most recent years and sent those for prior years to the ES&H Records Center. Group ESH-20 (Ecology) stored their records in files organized by topics such as Biology, Contaminate Monitoring, and Cultural Resources. In general, these types of record collections were considered to be active records rather than part of a formal collection. Table 3-4 shows the groups that existed within the ES&H Division when systematic review activities began, and whether they held records independent of the ES&H Records Center.

Table 3-4. Additional Records held within ES&H Groups

ES&H Group	Additional Records?
ESH-1: Health Physics Operations	No
ESH-2: Occupational Medicine	No
ESH-3: Integrated Risk Analysis, Management and Communication	No
ESH-4: Health Physics Measurements	No
ESH-5: Industrial Hygiene and Safety	Yes
ESH-6: Nuclear Criticality Safety	Yes
ESH-7: Occurrence Investigation	Yes
ESH-10: Hazardous Materials Response	No
ESH-12: Radiation Protection Services	Yes
ESH-13: ES&H Training	Yes
ESH-14: Quality Management	No
ESH-17: Air Quality	Yes
ESH-18: Water Quality and Hydrology	Yes
ESH-19: Hazardous and Solid Waste	No
ESH-20: Ecology	Yes

Since these additional records were considered to be “active”, a detailed review was not performed as part of the initial systematic review for the ES&H Records Center. Instead, the project team generated descriptions of these additional records to identify those to be reviewed in the future. These reviews were performed under the review of records held by the ENV Division, described later in this chapter. These reviews took place following a number of reorganizations and consolidations within the Lab, so the groups described later in this report do not necessarily reflect those above.

Review of the ES&H Records Center– The bulk of the systematic review of the ES&H Records Center took place between January and October of 2000. Records were reviewed at their storage location.

Following review, they were marked using one of the two rubber stamps described earlier based on whether they contained any Category 1, 2, or 3 documents. A log entry was made identifying the material reviewed by its location and its TR number. The log entry included the document category assigned to the material, the analyst whom performed the review, and the review date. A DSF was completed for any document identified as Category 1, 2, or 3.

On several occasions, records that had been reviewed were subsequently replaced with newly accessioned records. In general, these new records were also reviewed, meaning that several locations were reviewed two and even three times as new material displaced older material in the center. Since the ES&H Records Center was an active staging area for records, a cutoff accession date of October 31, 2000 was established as a stopping point for the initial review. The rationale for this date was the fact that all of the accessioned material in the Center had been reviewed by then and the rate at which new material was being accessioned was too slow to justify a continuing effort. Instead, material accessioned after October of 2000 would be reviewed at some point in the future.

A total of 1,187 boxes were reviewed during the initial systematic review of the ES&H Records Center. Of these, 227 (19%) were found to contain relevant material. The majority of the relevant material was designated as Category 2, as it was primarily records from the 1990s that were already readily available in published reports. Examples include AIRNET (NESHAPS) data used in periodic reports required to document exposures to the public from LANL operations, and airborne effluent data reported in the annual environmental surveillance reports.

One of the most useful finds from the initial systematic review of the ES&H Records Center were two notebooks of working notes and document excerpts that contained data on LANL's historical, site-wide radionuclide releases (Andrews ca. 1973). The first notebook (Volume 1 – Repos. No. 1733) contained data from 1948 to 1972. The second (Volume 2 – Repos. No. 1734) contained data from 1972 to 1996. These compilations had been assembled by LANL as an element of its response to a request from headquarters to assess its historical radionuclide releases.

In July of 2003 the ES&H Records Center was revisited to review material that had been accessioned since the initial systematic review. Copies of all Transfer Requests generated since October of 2000 [TR Numbers 120-186 (11/14/00) through 120-358 (6/20/2003)] were obtained and the records descriptions were examined to identify any potentially relevant material. Ten boxes were selected for further review, but no additional relevant documents were identified. In early 2009, another follow-up review was performed for material accessioned by the ES&H Records Center since the previous review. This review

was carried out in the same manner as that in July of 2003 and generated the same result: no additional relevant material was identified.

The Engineering Drawings Facility

In February of 2006 the project team began reviewing documents held by the LANL Engineering Drawings Facility at TA-63. This facility housed engineering drawings and associated documents (memos, letters, specifications, etc.) dating back to the 1940s. The documents, which were all on microfilm, included topics such as engineering studies and bases for facility modifications. Modifications were often performed to correct issues encountered after a facility began operating, such as ventilation problems. The documents in the TA-63 facility therefore included information on such problems and their impacts. They also included information such as radionuclide concentrations in soil in the vicinity of release points.

The project team's review of the TA-63 drawings facility was conducted in a focused, but still systematic, fashion. The goal was to obtain material to support the prioritization of radionuclide and chemical releases from the early LANL facilities. The initial searching, therefore, was for drawings pertinent to Original Technical Area buildings (especially D Building), Omega Site facilities and associated stacks, DP Site facilities and ventilation systems, and the Los Alamos town site.

The TA-63 facility maintained a database of their drawings inventory. The database included fields for TA Number, keywords, titles, etc. Drawings were searched by reviewing titles to identify those of interest. The selected drawings were then physically reviewed, and copies were requested of those deemed relevant to the LAHDRA project. The database was also used to search for drawings by TA Numbers. This included residential areas, as these were designated as TA-0. Approximately 1,000 historical drawings were selected as relevant to the LAHDRA project, obtained from LANL, and scanned to make them available via DocSleuth.

The project team also completed systematic review of the TA-63 microfilm records. As for the drawings, this review was conducted in a focused, systematic fashion with emphasis on documents related to the original Technical Area, Omega Site, DP Site, or the Los Alamos town site.

The TA-21 Library

The TA-21 library was a collection of material housed in a portable building at DP West. Its purpose was to act as a resource for individuals involved in decommissioning activities there. The facility included binders of memoranda, remediation investigation reports, and drawings. Much of this material had already been collected by the project team from its review activities in the Records Center and elsewhere. Nonetheless, a systematic review of this facility was completed and some documents and drawings of interest were retrieved.

The Records Processing Facility

The Records Processing Facility (RPF) managed records of what was formerly the Environmental Restoration (ER) group at LANL. Most of the holdings of the LANL Records Processing Facility, located at the Pueblo School Complex, had been scanned to PDF files and were available through an electronic document management utility. Review of this material is discussed later in this report. In addition to these electronic records, the project team also reviewed some hardcopy records that existed at the RPF earlier in the project, and records that had recently been acquired and not yet scanned.

Division or Group Records and Electronic Databases

As the project team completed its systematic review activities for LANL's centralized records collections it migrated its focus to records held within division or group offices. These were records that for whatever reason were maintained by their custodial organizations rather than one of the centralized records centers. These records included electronic databases. It was not the goal of the project team to review the records held by every LANL division or group. Rather, the project team selected a subset of LANL's numerous divisions that it felt had the greatest potential for providing information of interest. In general this selection process focused on divisions responsible for core Laboratory functions, eliminating those that served in only administrative capacities.

The initial focus of the review of division and group records was the Environmental Stewardship (ENV) Division. (As before, the discussions in this section reflect the organization of LANL's divisions and groups that existed when records review activities took place. The division or group titles may not reflect the current organizational structure due to frequent reorganizations.) The ENV Division consisted of a large number of groups, many of which held records of interest to the project team. Review of these records was therefore a substantial part of the team's activities once reviews at the centralized collections had largely drawn to an interim close. Review of records within the ENV Division is discussed later in this chapter.

Beyond the ENV Division, project team members also met with representatives of a number of other LANL divisions and groups to inquire about their activities and any records they held. The groups and divisions represented included:

- 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

Review activities that resulted from these discussions are described in the subsections that follow.

ENV Division Records

In May of 2006 the project team obtained a summary of records and databases generated by the groups and programs within the LANL Environmental Stewardship (ENV) Division. There were approximately 50 groups and programs listed, along with a number of electronic databases. The function of most of the groups and programs was to collect data needed to demonstrate compliance with state and federal regulations or that was otherwise required by the Compliance Order on Consent that was in place between LANL and the NMED. (At the time the Consent Order was the principal driver of the Laboratory's environmental remediation and surveillance programs.) Numerous databases had been created within ENV Division to store and manage the data collected by these groups and programs.

The project team met with numerous individuals representing various groups and programs within ENV Division. Team members spoke with these individuals about the types of information collected and maintained by the groups and programs they represented. These discussions were the basis for the team's approach to selecting what the records to review within ENV Division and for prioritizing these reviews. The groups and programs represented in these discussions included:

- Ambient air sampling
- Cultural Resources
- Direct Penetrating Radiation network (ambient monitoring)
- Environmental surveillance

- Geographic Information Systems
- Meteorological monitoring and data
- NEPA, Environmental Assessment, and Environmental Impact Statement records
- NESHAP compliance (radioactive emissions)
- Non-radioactive regulated air emissions and air quality permits (Clean Air Act)
- NPDES, pesticides and sanitary waste
- RCRA permits and records
- Records Processing Facility (environmental restoration and related records)
- Sample Management Office (sampling and analysis files)
- Soil and biota monitoring program (including DARHT)
- Storm water data (Clean Water Act)
- TA-54 performance assessment
- TSCA, PCBs, solid waste, and underground storage tanks

The Domino and PRS Databases– Of the document collections and other information sources identified within the ENV Division, the largest by far was the Records Processing Facility's Domino database. The Domino database was an electronic storehouse for historical and current RPF records, i.e., environmental restoration files. These included environmental project case files, remediation management records, regulatory compliance records, and decontamination and decommissioning records. The records were stored as PDF files and managed using the IBM Lotus Domino application. Domino is actually a business collaboration package rather than a database application, but as applied to management of the environmental restoration documents it functioned similar to a database and thus was referred to as such in the vernacular. The Domino application was accessed using a web-based front end that included provisions for searching.

Records in the Domino application were indexed using a unique identifier known as an ERID number. The system contained approximately 100,000 ERIDs, amounting to approximately 250,000 documents. (A record could contain multiple documents.) Systematic review of the Domino records was performed by going through them sequentially by ERID number and reviewing those with titles that were either of interest or too ambiguous to allow a judgment. Documents deemed relevant to the LAHDRA project were printed and a DSF was completed.

The RPF maintained another database called the Potential Release Sites (PRS) database. The PRS database contained documents related to historical activities at so-called "potential release sites", i.e., solid waste management units or other areas of concern. This database contained far fewer records than the Domino database. Review was performed in the same manner as for the Domino database. A listing

of titles was reviewed to select records of interest for examination. Few records were selected, but some information of interest was obtained.

Other ENV Division Records– Below are other records collection identified within ENV Division that were reviewed by the project team.

NEPA Records: Records pertinent to compliance with the National Environmental Policy Act (NEPA) and associated environmental impact assessments were stored in boxes and file drawers at TA-59. These records included documents associated with LANL's environmental impact statements and environmental assessments for LANL projects. They also included projects that were not required to have any NEPA documentation beyond a Department Environmental Checklist (DEC), or an Action Declaration Memorandum (ADM) upon which category exclusion declarations were based.

MAQ Records: The LANL Meteorology and Air Quality (MAQ) group maintained air quality and related records at its offices in White Rock, NM. pertaining to open burning activities, beryllium operations, and other laboratory activities involving hazardous air pollutants. In general these were recent records, going back no more than 5 years. Nonetheless a number of relevant documents were identified and retrieved. The review of MAQ records also included meeting with LANL staff responsible for the RADAIR (radioactive air emissions), STACKS (stack parameters), and RMUS (radioactive material usage survey) databases to gain an understanding of the information these resources contained.

Meteorological Data: Project team members met with LANL staff responsible for acquiring and managing meteorological data. Data were gathered from meteorological towers at several locations across the LANL site and from local weather monitors. Several reports were obtained by the project team, on subjects such as atmospheric dispersion modeling for the Los Alamos area, local precipitation data, and other local climatologic data.

Cultural Resources Group Reports: Project team members met with representatives from the LANL Cultural Resources group and reviewed a collection of their reports. Copies were subsequently requested of a number of these, as they included historical information about operations at LANL facilities.

The Litigation Support Database

In early 2000, the LAHDRA project team became aware of a number of small databases created for the Laboratory Counsel's office. These databases were known collectively as the Legal Counsel Litigation Support Database (LCLSD). Creation of the LCLSD began around 1990 with the scanning of numerous historical documents to image files. The documents selected were those potentially pertinent to the LANL Lab Counsel's activities. Many of the scanned documents were also subjected to Optical Character Recognition (OCR), creating a searchable file of the text. The database contained approximately 500,000 pages of documents.

During the early stages of the LAHDRA project team members made several attempts to gain access to the LCLSD. While the database itself was not made available, in 2003 the LAHDRA team received a hardcopy listing of the scanned documents available in five of its sub-databases. For each document the listing provided a document number, subject (title), author, addressee, copyee, date, status, and page count. The five sub-databases and the number of scanned documents available in each was as follows:

H-Division	1,442 documents
Human Studies Project Team	4,767 documents
Central Records Management	11,198 documents
Others	10,395 documents
Records Processing Facility	47,922 documents
Total	75,724 documents

A description of the information contained in each of these five sub-databases is provided in the following section.

Sub-databases within the Litigation Support Database–

H-Division: The H-Division sub-database of the LCLSD primarily included monthly (1943-1944, 1947-1964), quarterly (1965-1975, 1978-1990) and annual (1943, 1947, 1949-1953, 1957, 1987-1990) Health Division progress reports. It also contained progress reports from groups within the former Health Division, such as H-1, Radiological Monitoring (formerly H-6 and CMR-12), and H-4, Biological and Medical Research. Both of these groups were responsible for monitoring the use of radiological and non-radiological hazardous materials at LANL. Although the H-Division sub-database contained 1,442 documents, this number was a bit inflated given that it typically included three versions of each H-Division progress report: a complete report, a version redacted for Privacy Act information, and an abstract of the complete report.

Human Studies Project Team: The 4,767 documents listed in the Human Studies Project Team (HSPT) sub-database consisted primarily of weekly status reports, fact sheets, press releases, news articles, procedures, phone logs, and other administrative documents generated during the HSPT's document review activities at LANL. The majority of these documents were generated between 1991 and 1995; however, there were also some historical documents from the 1940s, 1950s, and 1960s. There were also a large number of documents from the 1970s related to the Karen Silkwood case and pion radiotherapy studies, and from the 1958 Cecil Kelley fatality.

Documents in the HSPT sub-database that were of interest to the LAHDRA project were the weekly bibliographies of documents released to the public, inventories of documents in LANL records collections, reports from the LANL autopsy tissue program, and H-Division monthly progress reports. The HSPT sub-database used a classification system for the H-Division reports it contained. The classification categories were 001, Bayo Canyon activities; 002, DOD-related activities; 003, human tissue studies; 004, non-Bayo Canyon releases; 005, other DOE contractor (human studies); 006, tracer studies (plutonium, uranium, radioiodine, tritium, radium, other); 007, history/general; 008, atmospheric testing programs; and 009, pion radiotherapy.

Central Records Management: The 11,198 documents in the Central Records Management sub-database covered the years 1943 to 1965. These documents included

- Monthly hazard and accident reports for month/year (1946-1954)
- Weekly health test data (1950-1956)
- Neutron exposure reports (1946-1958)
- Personnel exposure reports (1957-1958)
- Monthly and weekly reports (1951-1958)
- Monitoring results (1945-1957)
- Minutes from weekly Section Head meetings (1945-1955)
- Air Counts, pencil and ink originals (1950-1962)
- Hand, head, shoe and nose counts (1944-1956)
- Urinalysis/urine counts (1944-1957)
- Film badge exposures (1957-1958)
- Protective Equipment- respirators, clothing (1947-1962)
- Safety meetings (1961-1962)
- Experimental shots at TA-33 (1948-1955)
- Tritium exposures at TA-33
- SL-1 accident
- DP Site explosion (1-14-1947)
- Pajarito accident (1-8-1953)

Others: The 10,395 "Other" documents were primarily administrative records covering the period from 1943 to 1989. Examples of these records are:

- Contracts and contract modifications
- Reimbursement authorizations
- Personnel policies regarding overtime, moving expenses, employee benefits
- Personnel administrative panel meetings
- Organization charts (1945-1989)
- Telephone directories (1944-1989)
- The Atom (1964-1975)
- Annual reports to Congress of the AEC (1948-1973)

However, several other types of documents were also included, such as:

- Annual environmental monitoring reports (1970-1992)
- H-Division progress reports (1943-1980)
- RFI work plans for operable units (1989-1990)
- Glenn Neely Notes
- Dept. of Labor log and summary of occupational injuries and illnesses (1989-1992)
- Occurrence reports
- Newspaper articles

Records Processing Facility: As previously discussed, RPF documents were records from the Environmental Restoration program at LANL. The 47,922 documents in the LCLSD sub-database were also part of the Domino database discussed earlier in this chapter. The smaller number of documents reflects the fact the LCLSD sub-database only contained a subset of the total number of environmental restoration documents. The project team's review of the RPF sub-database predated its review of the Domino collection.

Review of the Litigation Support Database

Project team analysts reviewed the hardcopy listings of the document titles in each sub-database and selected documents for review. Ultimately, only 5% of the documents available in the five sub-databases were selected. The remainder were either clearly non-relevant or had already been captured by the project team from other collections. A breakdown of the number of documents selected from each sub-database is shown below.

H-Division	86 documents
Human Studies Project Team	155 documents
Central Records Management	1,706 documents
Others	764 documents
Records Processing Facility	1,102 documents
Total	3,813 documents

Project team analysts reviewed the selected documents electronically using commercial information retrieval and viewing software provided by LANL. The software allowed analysts to review the documents in a given sub-database one at a time, establish bookmarks where they left off, or jump to specific documents. Relevant documents were printed using a dedicated printer and attached to the corresponding DSF. Analysts also checked the LAHDRA project database to determine if a selected document had already been retrieved.

Systematic review of the scanned documents in the five LCLSD sub-databases began in May 2005 and was completed in September 2005. Approximately 400 documents (10% of the 3,813 selected for review) were selected and retrieved.

Weapons Engineering and Manufacturing and Weapons Physics Records

Systematic records reviews completed by the project team earlier in the project included a review of records held by the Weapons Engineering and Manufacturing (WEM) and Weapons Physics (WP) divisions. However, the nature of these records in conjunction with the information security restrictions imposed on project team analysts at that time meant only a limited review was possible. The reviews were conducted in accordance with a Special Security Plan that was issued in June of 2001.

The reviews focused on the contents of the WEM and WP vault-type room (VTR) located in the Administration Building at TA-3. Most of the documents held by these two divisions were classified and contained nuclear weapon design and testing information. All of the classified documents reviewed in the VTR were published after 1962. Thus, per the Special Security Plan in place at that time, this meant the reviews had to be performed on a restricted-access basis. In other words, project team analysts had to review the documents by title alone. They were prohibited from reviewing the contents.

At the time of the review, the WEM and WP division records consisted of approximately 18,876 classified documents and 1126 classified photographs. There were also classified video media of various formats (e.g. VHS). The project team was not allowed to review the videos. Based on their titles, two documents were identified by the project team as potentially relevant. An appeal was made to DOE for a team member to be able to review the contents of these documents to determine of they were indeed relevant, but it was denied.

Thirty-six classified safes were also reviewed for potentially relevant information. The safes contained 7,056 classified documents. Review of these documents (by title alone) did not identify any relevant to LAHDRA.

LANSCE Records

Earlier in the project team members performed a systematic review of records held at the Los Alamos Neutron Science Center (LANSCE), which is located within TA-53. The reviews focused on files within the Main Administration Building (TA-53-1) and the Radiological Air Monitoring Records Archive located in Sector R, Building 3, Room 3R-4 (TA-53-3). Approximately 10,000 documents were reviewed in the Main Administration Building. Of these, approximately 2,500 were identified as potentially relevant and underwent detailed review. Ultimately 36 of these documents were retrieved. They included shift supervisor logbooks that contained daily beam current and beam-hour data from as far back as 1971.

Forty-five boxes of documents (3,375 documents) located at the Radiological Air Monitoring Records Archive (Building 3R) were reviewed. Approximately 20% of these were identified as duplicates. The documents contained detailed information on radiological monitoring techniques and results from 1971 to the present. Most of them pertained to airborne releases from LANSCE. 97 documents were retrieved by the project team.

Beryllium-Related Records

The project team reviewed records held by the Industrial Hygiene and Safety (IH&S) group at TA-59. The focus of this review was older records from the former H-5 (industrial hygiene) group. H-5 was responsible for monitoring for beryllium and other hazardous materials used in Lab operations. A number of relevant documents were identified

On several occasions project team members met with the LANL beryllium program coordinator to discuss beryllium operations, releases, and records. This individual provided the project team with a number of useful reports pertaining to beryllium operations and releases at LANL.

On recommendation from other LANL staff members, the project team reviewed reference material used in preparing the environmental impact statement for the DARHT facility. Several documents were retrieved, addressing subjects including releases of aerosolized uranium and beryllium from dynamic experiments and concentrations of these materials in local soils.

Hydrodynamic Testing Records

The project team visited a classified vault in TA-22 that contained records from hydrodynamic testing activities conducted by several LANL groups and divisions. At the time the vault contained approximately 10 rows of collapsible shelving plus a number of flat-file cabinets used to store drawings and radiographs. The hardcopy records stored on the collapsible shelves included chronological files

(sequential memos and reports by date), correspondence files, and shot folders. The shot folders included shot summary reports and other detailed information. Sometimes information on materials included in a shot were given in detail (e.g., the mass of a specific material), and in other cases only part numbers were given (along with their mass).

It was not the goal of the project team to perform a systematic review of this material. Rather, the intent was to conduct a preliminary review of the types of information contained in the shot records and prepare a summary for future reference. Nonetheless, one document was selected for retrieval by the project team during its visit. It was redacted as required to make it unclassified and released. Several other documents that pertained to materials expended in shot activities in the early 1990s were noted. (By this time security restrictions had been relaxed such that appropriately cleared project team members were allowed to access the records in the TA-22 vault as long as they did not contain any Sigma 14 or Sigma 15 information.)

On several occasions project team members met with representatives from the LANL Hydrodynamic Experiments (HX) Division to discuss their activities and records. These discussions led to a box of documents describing materials expended in shot activities being compiled and sent to the LANL Records Center where it was reviewed by the project team. A number of useful documents, akin to some of those seen in the TA-22 vault, were identified and requested. These documents were unclassified, though several of them had to remain Official Use Only given their content.

Other Sources of Information

Project team members searched the photographic records of the Los Alamos Historical Society and obtained prints of photographs and maps of interest. More than 50 photographs were obtained, primarily aerial views of LANL facilities and surrounding areas from the 1940s and 1950s. The project team also obtained a title listing of photographic records held by the LANL Environmental Stewardship Division. Prints were obtained of numerous photographs from the early years of LANL operations at TA-1, TA-2, and TA-21. Numerous other photographs were also obtained through records review activities at LANL. The project team also obtained several videotape records from the Broadcast Media Gallery of the LANL Public Affairs Office.

As the LAHDRA project progressed, CDC also supported and benefited from a series of interviews conducted by Peter Malmgren as part of his "Los Alamos Revisited" oral history project. Trained and experienced in anthropology and related fields, Mr. Malmgren has been involved in several oral history projects in New Mexico over a span of many years. In his "Los Alamos Revisited" project, the 30-year

Chimayo, NM resident set out to offer a special perspective on the lives and concerns of retired Los Alamos workers. During the December 2000 to March 2003 period that CDC supported his project, Mr. Malmgren conducted over 100 interviews. Interviews numbered 1 thru 116 (the number 76 was skipped) are summarized briefly, with full names not identified, in Repos. No. 4081 of the LAHDRA document collection (Malmgren 2003). The interviews cover a very wide spectrum of jobs and life experiences of people who worked at Los Alamos and/or lived in the general area. Detailed transcripts were produced by Mr. Malmgren, and the interviews were audio taped.

Interviews with Past and Current LANL Staff or Other Individuals

Interviews of current and retired LANL workers and other individuals were conducted by the LAHDRA team 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. Workers sometimes help the document analysts assemble the "big picture" with regard to site operations. Interviewees can also identify additional interview candidates with knowledge about specific subject areas, assist in the interpretation of information from documents or other interviews, and describe record-keeping practices of years gone by.

Interview candidates can be identified from author or distribution lists from key documents, from division rosters or progress reports, or from other interviews. While interviews are typically conducted with individuals, group interviews allow participants to jog each others memories, yielding more information that would otherwise have been provided. All interviews are voluntary, and interviewees have the option to remain anonymous. In these cases, names are excluded from our records. In some cases, people who have held security clearances in the past can receive special authorization to speak freely during an interview, provided it is conducted in an appropriate facility and in accordance with all regulations and guidelines concerning handling of potentially sensitive content.

Summaries of interviews conducted by the project team are included in the project's information database. The database also includes transcripts and summaries of interviews with cognizant LANL staff that were performed by LANL. These records were obtained from the project team's systematic search activities, from the Archives in particular.

Some of the individuals who were interviewed by the LAHDRA team included:

- Scott Hughes: graduate student doing research on the evolution of the ES&H program at LANL.
- J. W. Nyhan: LANL staff member re: stack emissions from DP West.
- Jim McInroy: LANL staff member re: human tissue analysis program.

- John Miglio: LANL analytical chemist.
- Jim Lawrence: LANL health physicist.
- Bill Moss: LANL staff member (health physics and industrial hygiene)
- Jay Wechsler: LANL staff member (radionuclides in soils)
- Ron Stafford: LANL staff member re: plutonium handling and releases.
- Scott Miller: LANL staff member (monitoring for airborne releases)
- Gary Whitney: LANL beryllium program coordinator
- Tom Newton: LANL chemist (retired, worked in D Building starting in 1949, then moved to CMR Building)
- Helen Cowan: Former chemist at the Manhattan Project's "Met Lab." in D Building at Los Alamos during World War II, and later in LASL's CMR Building.

D Building Roundtable Discussion

LAHDRA team members worked with LANL personnel to set up a roundtable meeting with current and former Los Alamos workers who were reported to have knowledge of operations and activities D Building. D Building, part of the original Technical Area, was the Lab's original plutonium processing facility. The meeting was held on July 25, 2006 at LANL to coincide with key project team members being in Los Alamos for a public meeting the following day. Attendance was limited to individuals with the required level of security clearance so that classified information could be discussed freely. The meeting was videotaped, however, and an unclassified version has been made available to the public.

Meeting attendees included:

- Charles D. Blackwell, General Monitoring Section, H-1, retired
- Carl W. Buckland, Leader, General Monitoring Section, H-1, retired
- W. Clarence Courtwright, explosives safety engineer 1955-1991, retired
- Raymond Garde, LANL, retired
- Donald R. Gibbons, LANL, retired
- Joe Vigil, LANL, retired
- Jack Buddenbaum, LAHDRA team member
- Bob Burns, LAHDRA team member
- Joe Shonka, LAHDRA team member
- Tom Widner, LAHDRA Project Director

Plutonium release estimates were not located for D Building so the project team strived to learn as much as possible about the processing that was performed there. The goal was to determine methods for estimating how much plutonium could have been released. At the roundtable meeting, LAHDRA team members described what they had learned about D Building and the activities there. Attendees were

asked if they could address specific questions that remained, such as details of key steps in early plutonium processing, generation of airborne contamination, design of ventilation systems and some filters that were added, and indicators of environmental contamination. Unfortunately the participants knew very little about D Building, but the project team did learn some useful information about other LASL operations.

Summary Statistics

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.

Table 3-5 through Table 3-7 below show the breakdown of documents retrieved by the LAHDRA project team by document category, by where the documents were found, and by decade of publication. It should be emphasized these statistics reflect the documents identified by the project team as relevant to the goals of the LAHDRA project during its review activities. By no means do they reflect the overall distribution of documents at LANL, especially where publication dates are concerned.

Table 3-5. 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 3-6. 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 3-7. 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%

References

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Malmgren P. Brief Summaries of 115 Interviews Performed under the "Los Alamos Revisited" Oral History Project 2000-2003 2003. Repos. No. 4081.