

## **Expanded Discussion of the Systematic Document Search Component (Task 5) of the Oak Ridge Dose Reconstruction, by Site**

### **The Y-12 Plant**

The document collections of seven repositories at the Y-12 plant were reviewed by the project team. The repositories include:

1. Y-12 Audit Document Response Center
2. Y-12 Health, Safety, Environmental and Accountability Document Management Center (HSEA DMC)
3. Y-12 Enriched Uranium (EU) Operations Procedures Management Center
4. Y-12 Technical Library
5. Y-12 Engineering Records Management Office (ERMO)
6. Y-12 Records Center (RC)
7. Y-12 Central Files (CF)

All Y-12 repositories except the HSEA DMC and the Technical Library have some classified documents in their collections. The first three repositories contain documents from 1980 to the present. These centers were created to consolidate environmental management documentation and to support specific organizations at Y-12, such as Enriched Uranium Operations. The Enriched Uranium Operations Procedures Management Center is unindexed, but contains less than 200 procedures that were individually reviewed by members of the Task 6 team as part of the directed search. The document collections in the Audit Document Response Center and the HSEA Document Management Center are compiled in computer databases. The search strategy for the Audit Document Response Center and the HSEA Document Management Center was based on keyword searches of each center's database. However, if the document collection was small (less than 1,000 documents), then the entire contents of the database were reviewed. For example, the custodian of the HSEA DMC provided the project team with a printout of the entire document center database (82 pages) that was reviewed by the project team. When the document collection was too large (greater than 1,000 documents) for a comprehensive review of the database, the database was queried for project-related keywords. Searches for task-specific keywords were also conducted for Tasks 2, 3, 6, and 7 using keywords provided by the task managers. No relevant project documents were identified in either the Audit Center or the HSEA DMC.

The Y-12 Technical Library contains applied science information dating back to the 1940s, including reference books, scientific and technical journals (bound and microfiche) and approximately 15 linear feet of copies of Y series documents that are duplicates of record copies located in Y-12 Central Files. No documents relevant to dose reconstruction were identified in the Y-12 Technical Library.

The Engineering Records Management Office contains historical CAD drawings and construction specifications in a database that can be searched by drawing number. Over 20 drawings of building ventilation systems were requested from the ERMO for use in air dispersion modeling efforts for Tasks 2 and 6 assessments of releases of mercury and uranium.

See Section 6 of the Project Summary Report for a discussion of the Y-12 Records Center and Central Files repositories

### **The K-25 Site**

The document collections of ten document repositories at the K-25 site were reviewed by the project team. The document centers include:

1. K-25 Waste Management Division Document Center
2. K-25 Waste Management Division, Waste Manifest Records
3. K-25 Environmental Management Document Center
4. Gaseous Diffusion Plant Safety Analysis Document Management Center
5. K-25 Compliance and Environmental Management Document Center
6. Energy Systems Waste Management Organization (ESWMO) Document Center
7. K-25 Health and Safety Division Document Management Center
8. K-25 Environmental Restoration Document Management Center
9. K-25 Site Document Response Center
10. K-25 Site Records Center

The first nine document centers on this list are considered “modern” day centers. These centers were created over the last ten years to support individual divisions and to track environmental and waste management documentation. The document collections in each of these repositories were compiled into computer databases that could be keyword searched. The documents in these repositories, generally, do not contain information before the mid-1980s. The majority of historical documentation at K-25 is part of the K-25 Site Records Center document collection.

The search strategy of each of these “modern day” document centers was based on keyword searches of each center’s database. However, if the document collection was small (less than 1,000 documents), then the entire contents of the document collection were searched. For example, the repository custodian for the ESWMO document center had a printout of the entire document center database (about 100 pages of text) that the project team reviewed. When the document collection was too large (greater than 1,000 documents) for a comprehensive review of the database, the database was queried for project-related keywords.

Although the historical detail was missing from most of the documents in these centers, many of the modern day environmental investigations provided summary level historical information. These current-day investigations also provided clues, based on environmental monitoring data, to past activities. For example, environmental investigations of Poplar Creek in the 1980s and 1990s provided unique environmental monitoring data for a historical (1945-1964) area of coal ash disposal. Prior to these studies, no monitoring data were available for this location. This information allowed the team to make assumptions regarding the historical arsenic concentrations in this area of Poplar Creek (Task 7).

See Section 6 of the Project Summary Report for a discussion of the K-25 Site Records Center

### **The X-10 Site**

The document collections of fifteen repositories at the X-10 plant were reviewed by the project team. The repositories include:

1. X-10 Laboratory Records
2. X-10 Records Center
3. X-10 Director's Document Control Center
4. ORNL Central Research Library
5. Research Reactors Division Document Control Center
6. X-10 Chemical Technology Division Document Management Centers (4)
7. Waste Management and Remedial Action Division (Document Management Critics)
8. ORNL Engineering Records Center
9. Research Reactors Division Satellite Repositories (6)
10. X-10 Radiological Control Records

See Section 6 of the Project Summary Report for a discussion of the X-10 Laboratory Records

### *X-10 Records Center*

The Oak Ridge Dose Reconstruction Feasibility Study identified the X-10 Records Center as one of the most important repositories for further investigation during the ORDR. There are approximately 6,000 cubic feet of records in the center, consisting of unclassified inactive records from X-10 divisions dating from the mid-1940s to the present. Records include draft reports, technical notebooks, analytical laboratory datasheets, correspondence, equipment specifications, hand-written calculations, and computer output files, as well as personnel files subject to the Privacy Act.

Systematic review of all records was conducted using the BLUREC database as a search guide. For each box or group of boxes submitted to the document center in the same records transmittal, the BLUREC database provides the box number(s), source division, and brief description of box contents. Although the database can be searched by keyword, systematic review of individual boxes was judged necessary because the record description provided in the database was often not very descriptive. For sequences of boxes of similar type/description, a representative sample of boxes (i.e., 20 - 30%) from the sequence was selected for analysis. If the sample was of interest, all the boxes in the sequence were investigated. For each box or sequence of boxes reviewed, a box log was completed with a description of contents, dates of files, and the source division.

A significant volume of records in the X-10 Records Center (approximately 40%) are subject to the Privacy Act, including personnel history files, medical records, and miscellaneous human resources records. A sampling of records of this type was conducted with the assistance of X-10 staff members, who redacted names and social security numbers from randomly selected records prior to review. In addition to records subject to the Privacy Act, there is a group of boxes in the Records Center belonging to the Ethics Office. These boxes were not reviewed because investigators must obtain authorization from the Ethics Officer before receiving access to these boxes.

On the initial systematic search of records in the X-10 Records Center, a number of boxes were identified as *Amissing@* from the shelves, either because they had been destroyed per the document retention schedule, shipped to another repository (e.g., the Low Risk repository for boxes scheduled to be destroyed, the Federal Records Center, or the Vital Records Vault), or had been checked out by an ORNL staff member. An effort was made to identify the location of as many of these records as possible by identifying which records had been destroyed, reviewing these records in their new location (the Low Risk repository or the Vital Records Vault, both on

the ORNL site), or retrieving the checked-out records. Of the missing records, 74 were identified as destroyed (primarily vehicle gate registries, Ph.D. applicant files, laboratory data sheets, security checks, work orders, and R&D files).

A total of approximately 2,400 boxes (approximately 40%) were manually reviewed during the Task 5 systematic search. The majority of the remaining boxes were included in the Asampled@ groups. Information identified of possible interest to the Dose Reconstruction included environmental sampling data sheets (e.g., sampling of fish, grass, soil, stack monitoring) in support of the annual site-wide environmental monitoring efforts (collected in the late 1980s or later), flow data for White Oak Dam (used in the Task 4 investigation), and indoor air monitoring data for lead. Copies of materials requested during the Task 5 search or task-specific searches included graphite reactor logbooks (Task 1) and White Oak Dam flow data (Task 4). No sampling of non-examined documents was necessary because no large groups of documents, except for Ethics Office files, were excluded from systematic review.

The X-10 Directors Document Center contains approximately 600 - 700 cubic feet of records on open shelves, as well as two cabinets of microfiched records in the X-10 Lab Records Center vault. Records consist of unclassified historical correspondence to and from the directors and key managers of ORNL from the mid 1940s to the present. Directors File records from 1978 and original hard copies of the microfiched records (which date from 1940-1957) are boxed and stored in the ORNL Records Center (approximately 20 boxes). These records were reviewed and documented during the systematic search of the X-10 Records Center.

Folders for records from 1948 - 1977 are filed on open shelves by year and division and/or subject (122 approximately 4-foot long shelves). No true indexing system is available for these records; however, "File Guides" listing the names of the folders are available for several years. During the Task 5 systematic search, folders were manually searched by scanning the folders for a given year to identify those with subjects likely to be relevant to the Dose Reconstruction Project. Some of these included "Health Physics", "Operations Division", "Reactor Safety", "Reactor Operations Review", and "Waste Disposal". The folders reviewed and searched were documented. In addition, a random sampling of folders having titles that suggested contents not relevant to the Oak Ridge Dose Reconstruction Project was reviewed. Examples of folders not containing relevant information included "Contracts", "Finance and Materials", "Foreign Travel", "Labor Relations", "Patents and Legal Proceedings", "Reproduction Printing and Graphic Arts", "Telephones", and "Visitors".

Information identified of possible interest to the Dose Reconstruction included Operations Division monthly reports and reactor review reports, correspondence regarding stack, effluent, and environmental monitoring from the 1950s and 1960s, and correspondence regarding release incidents. Copies of approximately 100 files were requested. No sampling of non-examined documents was necessary because no large groups of documents were excluded from systematic review.

The ORNL Central Research Library contained a total of 30,000 cubic feet of records. The collection consisted of documents from outside sources such as reference books, periodicals, microfiche/film/photos, and copies of declassified documents from the X-10 Laboratory Records. These records dated from the 1940s to the present.

Most of the documents in the ORNL CRL were unclassified records, which are publicly available. The shelves containing these reference books and periodicals were visually checked to confirm that no additional information had been inadvertently placed on them. The older documents such as the micro photos and AEC documents stored on the second floor were randomly reviewed for relevancy and duplication.

The Research Reactors Division (RRD) Document Control Center is an unclassified repository containing records from the Research Reactors Division and correspondence from other divisions to the Research Reactors Division that became part of the Research Reactors Division record. The document center contains approximately 850 cubic feet of records dating from the construction of the Research Reactor (about 1960) to the present. Types of records include correspondence, fabrication files, vendor files, operating forms, procedures, calculations, safety work permits, fuel element certifications, photos and drawings, QA records, corrective actions, control room shift checks, surveillance test procedures, diesel fuel inventories, and experimenter maintenance packages.

The majority (about 85%) of the records are indexed in the ASKSAM database; some of the older documents are not yet on the system. During the Task 5 systematic search, the database was searched using the project keywords. The search effort focused on records prior to 1990. Many of these older records were sent previously to Lab Records to have ORNL numbers affixed. These records were reviewed during the Task 5 systemic search of the X-10 Lab Records document center. Approximately 30 records were reviewed during the systematic search. No information of relevance to the Dose Reconstruction was identified during the search of the RRD Document Control Center.

The X-10 Chemical Technology Division Document Management Centers includes four repositories: Administrative, Radiochemical Engineering Development (REDC), Radiochemical Technology Section (RTS) and the Applied Technology Program (ATP). There were over 300 cubic feet of documents in the four CTDDMC records repositories. Keyword searches of all the databases at the X-10 CTDDMC were conducted. Three areas were manually searched: the logbooks in X-10 building 3019, REDC Records Drawer #16, and RTS individual files.

The Waste Management and Remedial Action Division Document Management Center (WMRAD DMC) contains unclassified records from the WMRAD. The document center was created in 1987, and contains approximately 1200 cubic feet of records in two rooms. Records date from the 1950s to the present. Older logbooks (from the 1950s and later) documenting daily activities in the burial grounds were moved to ORNL Lab Records. Most documents currently held in the records center date from the mid-1980s and later.

All records are indexed in a computer database and can be accessed by keyword, author, or date. During the Task 5 systematic search, records were searched using the project keywords. In addition, several records of different report types were randomly searched. These included data check sheets, safety records, drawings, reports, and occurrence reports. A total of 77 documents were reviewed. Most were related to routine on-site waste or radiation monitoring issues and safety checks from the mid-1980s or later. Most documents of potential interest to the Dose Reconstruction had been previously requested during the X-10 Lab Records directed search. A copy of one additional document was requested.

The ORNL Engineering Records Center contains unclassified files of drawings for all current and historical engineering construction projects at ORR, produced either by on-site staff or outside contractors. The records center has been in existence for at least 30 years and contains records for over 400,000 drawings dating from the early 1940s to the present. Types of records include original "mylar" engineering/ construction drawings, microfilm ("aperature cards") of more than 400,000 drawings, and computerized copies of more recent drawings, as well as project documentation supporting the drawings. All versions of all drawings are retained in the event that someone requests to review the original design specifications.

A computerized database comprises the primary indexing system. This database indexes all holdings from 1988 and to date, and includes information on the building number to which the drawing pertains, type and date of the drawing, and drawing number. Several records of each type were randomly reviewed during the Task 5 systematic search. In addition, project documentation files were randomly searched. No files were requested during the systematic search.

Six satellite repositories of the Research Reactors Division were searched. These repositories and approximate volume of records in each were:

- Maintenance Department Repositories (88 cubic feet)
- RRD Training Repository (56 cubic feet)
- Tower Shielding Facility Repository (59 cubic feet)
- Quality Assurance (QA) Repository (47 cubic feet)
- Materials and Procurement Group Repository (48 cubic feet)
- Engineering Design Record Repository (32 cubic feet)

All of these repositories were created in 1987 or later. These repositories contain unclassified records pertaining to maintenance, training and safety, quality assurance, materials purchasing, and engineering design modifications for the Research Reactors and/or High Flux Isotope Reactors Division. Records at all of the repositories are indexed on computerized databases by record number. The oldest records in these repositories were records in the Materials and Procurement Group Repository, which date from the 1960s to the present. Records from the other repositories date from the mid-1980s and later. During the Task 5 systematic search, random searches of each repository were conducted to sample records of each type. No information of relevance to the Dose Reconstruction was identified.

The Tower Shielding Facility was built in 1953 to conduct R&D in support of the Aircraft Nuclear Propulsion Test Program. The documents located in this area were reviewed. Special emphasis was placed on identifying incidents or accidents that may have resulted in an offsite release. No records from 1954-1957 were found at this site. A review was also made to determine if dose rates from skyshine at the site boundary were considered.

The X-10 Radiological Control Records houses the Health Physics Division records at the ORNL. There are two types of records that are part of the Radiological Control Records: dosimetry records (internal and external) and radiological surveillance records. The Radiological Control Records contains 650 cubic feet of dosimetry records, 300 cubic feet of Health Physics surveillance records, and 12 cubic feet of incident/occurrence records from 1943 to the present. The HP surveillance records are actually physically located in the field offices with the surveillance HP technicians at various active HP areas at the X-10 plant. There was no database

or listing for any of the Radiological Control Records. Because of the nature of the records, most of the effort in this repository was directed at a review of the collection of X-10 incident/occurrence records.

### **Off-Site Repositories**

Twelve off-site repositories were reviewed by the project team. These included:

1. National Archives and Records Administration (Maryland)
2. Federal Records Center (Atlanta)
3. National Archives Center (Atlanta)
4. DOE Records Holding Center
5. Office of Scientific and Technical Information
6. Information Resource Center for Environmental Restoration
7. DOE-Oak Ridge Public Reading Room
8. Oak Ridge Associated Universities
9. Radiation Research Collection at the University of Tennessee
10. Oak Ridge Room, Oak Ridge Public Library
11. Tennessee Department of Environmental Conservation
12. Tennessee Valley Authority

The off-site repositories identified as containing records about historical operations at ORR generally fell into one of three categories: federal records centers, off-site DOE repositories, and miscellaneous off-site repositories. Following is a brief discussion of each of the 12 off-site repositories that were examined as part of this effort.

#### *Federal Records Centers*

The U.S. Government maintains repositories around the country for storage of inactive records concerning operations of government agencies. Inactive records involving operations at ORR are sent to the National Archives and Federal Records Center in East Point, Georgia and to the National Archives and Records Administration (NARA) in College Park, Maryland.

#### *National Archives and Records Administration (Maryland)*

The NARA in Maryland contained both classified and unclassified inactive records pertaining to the early development and activities of the ORR when it was under the administration of the Manhattan Engineering District and the Atomic Energy Commission in the early 1940's and 1950's. The NARA staff identified 86 boxes containing ORR records. All 86 boxes were reviewed. The boxes contained information about such items as building construction on the ORR, atomic bomb development program, the K-25 Gaseous Diffusion Plant, X-10 Graphite Reactor, and a collection of daily diaries from the manager of the AEC.

Mr. S. R. Sapirie was Director of Oak Ridge Operations for the AEC from 1943 - 1972. 11 boxes containing his daily logs were examined in detail. The review established that the manager's attention was focused on project management and budgeting issues and not health and safety items except when incidences and releases imposed significant costs. Important projects were noted in the log as well as releases large enough to reach the attention of his level of management. All of the incidents noted in these logs were reviewed to assure that they had been considered in the Oak Ridge Dose Reconstruction. It was felt by the Task 5 team that the entries

(or lack thereof) provide a valuable independent check that all significant releases from the ORR have been identified and considered in the Dose Reconstruction analysis.

#### *Federal Records Center (Atlanta)*

The Federal Records Center - Atlanta contained over 4500 boxes of DOE-Oak Ridge records. Although records were from the 1940's to the present, most of the records were recent, non-relevant records such as finance, security (i.e. visitor control), medical x-rays, patent information, and personnel records (i.e. paycheck stubs, deductions). Both the descriptions in the NARS-5 Database and the Form 135's were manually reviewed to select documents of potential interest. (These are required by NARA and provide a summary and the contents of the box.)

All the boxes containing documents of potential interest were reviewed. One to three randomly selected boxes from each series of non-relevant boxes were also reviewed. If any randomly selected box contained documents of potential interest, all the boxes in that series were reviewed.

#### *National Archives Center (Atlanta)*

The National Archives Center receives records from the Federal Records Center - Atlanta once they become publicly available. The records date back to 1943 and can be broken down into three general categories: ORR (i.e., K-25, X-10, and Y-12), the town of Oak Ridge, and DOE-Oak Ridge offsite operations (programs at Hanford, Livermore, INEL and Brookhaven).

No electronic databases were available for this repository's holdings. The Record Receipt Forms containing a description of each of the 2500 boxes submitted to NAC by DOE-Oak Ridge were manually reviewed. The contents of all boxes identified as potentially of interest were manually reviewed.

#### *Off-Site DOE Repositories*

See Section 6 of the Project Summary Report for a discussion of the DOE Records Holding Center

#### *Office of Scientific and Technical Information (OSTI)*

OSTI provides support for the Department of Energy's Scientific and Technical Information (STI) Program and maintains a centralized base of support to assist departmental elements in planning, developing, and implementing STI activities. DOE-originated and worldwide literature on advances in subjects of interest to DOE researchers are collected, processed, and disseminated by OSTI using computerized databases, publications, and other media. Records date from the 1940s to the present and are both unclassified and classified. OSTI is under the direction of DOE-Headquarters. Databases available at OSTI were keyword searched using an extensive keyword list and identified documents were retrieved and manually reviewed. Additionally, more than 2,000 non-database documents (mostly classified) were manually reviewed.



### *Information Resource Center for Environmental Restoration*

The Information Resource Center for Environmental Restoration is an offsite administrative site for the collection of unclassified documents concerning the environmental restoration activities at the Oak Ridge Operations (ORO). These records were found to be a duplicate subset of the holdings of the K-25 ERDMC, which had already been thoroughly searched and is discussed elsewhere.

### *DOE Oak Ridge Public Reading Room*

The DOE-Oak Ridge Public Reading Room contains inactive records from ORO. The holdings are divided into three listings: Human Radiation Experiment Study, Epidemiological Study (commonly known as Oak Ridge Health Studies), and Freedom of Information Act documents requested by the public through DOE-OR. The listings were keyword searched and all selected documents were manually reviewed.

### *Oak Ridge Associated Universities*

The holdings of three small libraries located at Oak Ridge Associated Universities were examined for the existence of potentially relevant material. The Center for Epidemiologic Research contains information on worker exposure and health and mortality studies. The Oak Ridge Institute for Science and Education Library contains medical and scientific books and journals. The Energy Environment Systems Library also contains scientific books and journals. Most of the material was found to be publicly available or available at OSTI and unclassified and consequently of limited interest to the project.

### **Miscellaneous Off-Site Repositories**

#### *Radiation Research Collection of the University of Tennessee*

The Radiation Research Collection of the University of Tennessee houses the papers of several renowned scientists, including Alexander Hollander, the first director of the ORNL Biology Division, and K. Z. Morgan, the Health Physics Division Manager at ORO from 1943-1973. The "Manuscript Guide Index" for the Biology Division Records and the "Index to Dr. K. Z. Morgan's Personal Files" were manually reviewed. Twenty boxes of Dr. Morgan's files were retrieved and reviewed.

#### *Oak Ridge Room Oak Ridge Public Library*

The "Oak Ridge Room" located at the Oak Ridge Public Library contained approximately 100 cubic feet of documents related to the City of Oak Ridge and its surroundings, including the ORR. Materials in the "Oak Ridge Room Subject Headings" related to the ORR were reviewed. These headings included environment, environmental reports, ORGDP, weather, Y-12 and community disposal.

#### *Tennessee Department of Environmental Conservation*

Four Divisions at the Tennessee Department of Environmental Conservation offices in Nashville were included in the Oak Ridge Health Studies Systematic Search: Division of Radiological Health, Division of Air Pollution Control, Division of Water Pollution Control, and Division of

Solid/Hazardous Waste. Each division was contacted, the responsible individual was interviewed, and the document repository areas (if they existed) were searched. No copies of reports were requested as all of the information was found to be available at previously searched repositories.

#### *Tennessee Valley Authority*

Two Tennessee Valley Authority repositories were included in this study: TVA Knoxville and TVA Chattanooga. The focus of the search was at TVA-Knoxville, as the TVA Chattanooga repository had been thoroughly searched during the Oak Ridge Feasibility Study. Both a manual and a keyword search were conducted at TVA Knoxville. Only a keyword search of the TVA-Chattanooga was conducted.