Hanford Environmental Dose Reconstruction Project

Monthly Technical Report

April 1988

Prepared for the Technical Steering Panel

**Work Supported by
the U.S. Department of Energy
under Contract DE-AC06-76RLO 1830**

**Pacific Northwest Laboratory
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**Pacific Northwest Laboratory
Richland, Washington 99352**

HANFORD ENVIRONMENTAL DOSE RECONSTRUCTION PROJECT

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PREFACE

This monthly report summarizes the technical progress and project status for the Hanford Environmental Dose Reconstruction (HEDR) Project being conducted at Pacific Northwest Laboratory (PNL) under the direction of a Technical Steering Panel (TSP). The TSP is composed of experts in numerous technical fields related to this project and represent the interests of the public. The Department of Energy (DOE) funds the project. The organization for the project is outlined below.

HANFORD ENVIRONMENTAL DOSE RECONSTRUCTION PROJECT ORGANIZATIONAL STRUCTURE

MANAGEMENT SUMMARY

OBJECTIVE

The objective of the Hanford Environmental Dose Reconstruction (HEDR) Project is to develop estimates of potential radiation doses that the public could have received from radioactive materials released from Hanford operations beginning in 1944.

PROGRESS

This summary report covers progress for the month of April 1988, including the following:

- continued preparations for the first meeting of the Technical Steering Panel (TSP)
- initiated computer calculations to more precisely define the fission product inventory of iodine-131 from the Separations Plants
- continued the literature review and database development of surface-water data
- analyzed atmospheric dispersion calculations assuming a uniform release rate and release rates during 8-hour periods for various times during the day
- continued to review the effects of nuclear testing fallout on monitoring measurements
- located the milk distributors/producers and creameries for 1945 - 1950 in the Hanford region.

MAJOR ISSUES AND ACTION TAKEN

None.

PLANNED WORK FOR SUBSEQUENT MONTHS

Work planned for subsequent months includes the following:

- continue preliminary data collection

- continue uncertainty/sensitivity analyses at the task level to identify key variables and parameters
- continue preparations for the first meeting with the TSP.

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TASK 03 SOURCE TERMS

OBJECTIVE

The objective of this task is to develop quantitative estimates of all significant emissions of radionuclides from Hanford operations during the period 1944 to the present.

PROGRESS

An IBM PC System 2 is now being used to calculate the potential fission product inventory of iodine-131 from the Separations Plants.

Records and documents were added to the database.

MAJOR PROBLEM AREAS AND ACTION TAKEN

None.

PLANNED WORK FOR SUBSEQUENT MONTHS

Work anticipated in upcoming months includes:

- complete preliminary assessment of the calculations to more precisely define the fission product inventory of iodine-131 from the Separations Plants for 1945
- continue to survey documents and information on facility operations and emissions data
- complete initial survey of computer codes to estimate the fission product inventory in irradiated fuel elements; initiate the effort to define the uncertainty in the estimation as a function of the fuel's location in production reactors
- initiate the work to define problems in estimating the airborne releases from production reactors.

TASK 04 ENVIRONMENTAL TRANSPORT

OBJECTIVE

The objective of this task is to reconstruct the movements of radioactive materials from operating areas to potentially exposed populations via the atmosphere, surface water, and ground water.

PROGRESS

Additional variations of a project "influence diagram" were prepared to assist in the definition of subtasks that need to be performed.

Work for the surface-water studies involved a literature review and database development. References from the Hanford Technical Library were assembled and copied.

Atmospheric dispersion was calculated, and sensitivity analyses of the results conducted. Analysis of the calculations, assuming a uniform release rate and release rates during 8-hour periods beginning at various times during the day, is continuing. A subtask to investigate wet and dry deposition parameters for the Hanford environment was initiated.

MAJOR PROBLEM AREAS AND ACTION TAKEN

None.

PLANNED WORK FOR SUBSEQUENT MONTHS

Work will continue on the project sensitivity analyses. The surface-water literature review and database development will also continue.

TASK 05 ENVIRONMENTAL MONITORING

OBJECTIVE

The objectives of this task are to assemble, evaluate, and report historical environmental monitoring data and to use the data to estimate the contributions of Hanford operations to radionuclide concentrations in environmental media.

PROGRESS

A search for sources of information describing the effects of nuclear testing fallout on monitoring measurements at Hanford continued.

A request was issued to former Hanford employees to ascertain their knowledge of past emissions and environmental monitoring data, and to determine how they might assist this task and Task 03. Those contacted were previously involved in emissions or environmental monitoring work as reported in existing historical documents.

MAJOR PROBLEM AREAS AND ACTION TAKEN

None.

PLANNED WORK FOR SUBSEQUENT MONTHS

Work will continue in the current areas of emphasis. Responses from former Hanford employees with knowledge that may be of use in reconstructing emissions and monitoring data will be received and reviewed. Plans will be made for discussions with those whose experience may be of assistance in this task and Task 03.

TASK 06 DEMOGRAPHICS, AGRICULTURE, FOOD HABITS

OBJECTIVE

The objective of this task is to develop the population and agricultural data needed to estimate the population doses that may have resulted from releases of radioactive materials from Hanford operations.

PROGRESS

The demographic consultant contract was signed. Producer/distributors, creameries, and simple producers were located for 1945-1950. Computer digitizing of dairy information has begun. The interviewing of individuals who raised backyard cows has started.

The subcontract to estimate the effort required to obtain population figures for the Indian tribes is in place.

Key informants with knowledge of dairy locations for Walla Walla and Kittitas counties were contacted. Information about dairy feeding practices were documented in a preliminary draft. Agricultural production spreadsheets continued to be developed. Agricultural and land use maps for several counties were gathered.

MAJOR PROBLEM AREAS AND ACTION TAKEN

None.

PLANNED WORK FOR SUBSEQUENT MONTHS

Work anticipated in upcoming months includes:

- complete description of dairy industry for Yakima, Benton, Franklin, Walla Walla, Adams, Grant, and Kittitas counties for 1945-1950.
- have initial demographic methods reviewed by experts
- complete initial estimates of milk and vegetable production and consumption for 1945-1950
- continue interviewing individuals who raised backyard cows
- start developing information on other counties in the 50-mile and 200-mile radius.

TASK 07 DOSE ESTIMATES

OBJECTIVE

The objective of this task is to use information developed by Tasks 03 through 06 to estimate potential radiation doses to populations from past releases of radioactive materials from Hanford operations.

PROGRESS

Work during April involved preliminary investigative work to recover the original data notebooks of field experiments conducted at Hanford in the early 1960s concerning the deposition of iodine-131 on vegetation and in the early 1950s concerning the effects of reactor effluents on cereal crop plants. Task 07 also worked with Task 06 to identify dairies and backyard milk cows that may have been located in Benton and Franklin counties in the early 1940s.

MAJOR PROBLEM AREAS AND ACTION TAKEN

None.

PLANNED WORK FOR SUBSEQUENT MONTHS

Work will continue on developing information about the historical iodine-131 milk pathway.

TASK 08 INFORMATION RESOURCES

OBJECTIVE

The objectives of this task are to meet HEDR project information needs and to develop and maintain a microcomputer-based tracking and retrieval system.

PROGRESS

Input to the Information Resources Tracking Database continued. More than 1100 records have been entered into the database.

A daily logbook covering the last 6 months of CY 1945 was recently located. The logbook contains information useful in calculating the iodine-131 content of irradiated fuel at the time of dissolution. This logbook can be declassified with some relatively minor deletions.

MAJOR PROBLEM AREAS AND ACTION TAKEN

The 3760 Building access to the Hanford General Usage Network (GUN) has been postponed due to funding restraints. Hookup of the HEDR Task 08 microcomputer station to the GUN system probably will not occur in FY 1988.

PLANNED WORK FOR SUBSEQUENT MONTHS

Input to the Information Resources Tracking Database will continue.

Efforts will be made to locate documents necessary to supplement daily log type information for January-June 1945.

Consideration will be given to evaluating a collection of early (1943-1955) Hanford documents that have been transferred from Oak Ridge, Tennessee, to the Atlanta Federal Records Center for storage.

TASK 09 RECORDS MANAGEMENT

OBJECTIVE

The objectives of this task are to provide storage and control of completed project records, maintain an automated inventory of all project documentation, and provide a reference service to project staff and others.

PROGRESS

Procedures for transferring records to the Public Reading Room are being developed. These procedures will include instructions for duplicating the records, transferring the copies to the Public Reading Room, and filing and updating the copies stored in the Public Reading Room.

The revisions for the Project File Index and task indexes have been drafted. The Project File Index will identify all the categories for the project, except Technical, which will be identified on the task indexes. By revising the indexes, the categories between project and task will be consistent.

MAJOR PROBLEM AREAS AND ACTION TAKEN

None.

PLANNED WORK FOR SUBSEQUENT MONTHS

Work anticipated in upcoming months includes:

- continue processing incoming project records
- develop and issue procedures for duplication and transfer of completed project reports and supporting documents to the Public Reading Room at the Federal Office Building
- provide instruction to the Public Reading Room for filing records according to the Battelle Standard Filing System.

TASK 10 QUALITY ASSURANCE

OBJECTIVE

The objectives of this task are to ensure continuous quality assurance (QA) support and coordination with all project tasks. These objectives are met through the identification and documentation of QA requirements in the form of a QA Plan and periodic monitoring of project activities during the life of the project to ensure compliance with these requirements.

PROGRESS

Revision 1 of QA Plan OHE-3 was completed and a final review was performed. The QA Plan is currently in the approval process and will be issued in May.

The project impact level has been reclassified as Impact Level II. The Project Impact Level Approval Form documenting this change is still in the approval process.

An Interim Change Notice (ICN) to procedure RMP-1, HEDR Records Control, was drafted in order to clarify protocols for records correction. The ICN has been reviewed and will be distributed in May.

MAJOR PROBLEM AREAS AND ACTION TAKEN

None.

PLANNED WORK FOR SUBSEQUENT MONTHS

Activities anticipated in upcoming months include:

- issue revision to QA Plan OHE-3
- distribute interim change notice (ICN) for RMP-1
- assist in implementation of QA program requirements
- perform a Software Control Surveillance to the Environmental Transport Codes.

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