Hanford Environmental Dose Reconstruction Project

Monthly Report

April 1991

Prepared for the Technical Steering Panel

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RECONSTRUCTION PROJECT

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Pacific Northwest Laboratory
Richland, Washington 99352

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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 the Pacific Northwest Laboratory (PNL)^(a) under the direction of a Technical Steering Panel (TSP). The TSP is composed of experts in numerous technical fields related to this project and represents the interests

of the public. The U.S. Department of Energy (DOE) funds the project.

Figure 1 shows the PNL organizational structure of the HEDR Project. Table 1 shows the status of PNL work to comply with directives issued by the TSP.

FIGURE 1. Organizational Structure of the Hanford Environmental Dose Reconstruction Project

^(a)Battelle Memorial Institute operates the Pacific Northwest Laboratory.

TABLE 1. Status of Directives(a)

		<u>Complete</u>	<u>Ongoing</u>	<u>Phase I</u>	<u>Phase II</u>
88-1	(a) Proposals		x		
	(b) Source Terms			x	
88-2	Vegetation			x	x
88-3	Status Reports		x		
88-4	Ground Water			x	x
88-5	Maps	x			
88-6	Resumes	x			
89-1	Indian Tribes			x	
89-2	Bioassay Data			x	x
89-3	Document Handling		x		
89-4	Reactor Purging			x	x
89-5	Phased Approach		x		
89-6	Meeting Materials		x		
89-7	Tech Communication			x	x
89-8	Phase II Planning			x	
89-9	Project QA Plan		x	x	
89-10	Contracts with Tribes			x	
90-1	Project Direction		x		
90-2	Dose Cut-Off Limit		x		

(a) Note: For simplicity, TSP directives are identified here using only key words. The complete directives are available from the TSP.

Executive Summary

The objective of the Hanford Environmental Dose Reconstruction Project is to estimate the radiation doses that populations could have received from nuclear operations at Hanford since 1944. The project is being managed and conducted by the Pacific Northwest Laboratory (PNL) under the direction of an independent Technical Steering Panel (TSP).

The TSP consists of experts in environmental pathways, epidemiology, surface-water transport, ground-water transport, statistics, demography, agriculture, meteorology, nuclear engineering, radiation dosimetry, and cultural anthropology. Included are appointed technical members representing the states of Oregon and Washington, cultural and technical experts nominated by the regional Native American tribes, and an individual representing the public.

The project is divided into the following technical tasks. These tasks correspond to the path radionuclides followed, from release to impact on humans (dose estimates):

- Source Terms
- Environmental Transport
- Environmental Monitoring Data
- Demographics, Agriculture, Food Habits
- Environmental Pathways and Dose Estimates.

The Source Terms Task develops estimates of radioactive emissions from Hanford facilities since 1944. These estimates are based on historical measurements and production information.

The Environmental Transport Task reconstructs the movement of radioactive materials from the areas of release to populations. Movement via the atmosphere, surface water (Columbia River), and ground water is studied.

The Environmental Monitoring Data Task assembles, evaluates, and reports historical environmental monitoring data. A major effort of this task is to separate Hanford as a source of radionuclide concentrations in the environment from concentrations caused by natural sources and nuclear testing fallout.

The Demographics, Agriculture, Food Habits Task develops the data needed to identify the populations that could have been affected by the releases. Population and demographic information are developed for the general population within the study area. This information will also be developed for several special population groups, including Native American tribes in the study area, Army personnel who were stationed at Hanford, Hanford construction workers, and migrant farm workers.

In addition to population and demographic data, the food and water sources and consumption patterns for populations are estimated because they provide a primary pathway for the intake of radionuclides. Historical dairy farming practices and milk distribution systems are studied because milk is a significant pathway for iodine-131 to enter the human body. Cows could have eaten vegetation contaminated with this radionuclide.

The Environmental Pathways and Dose Estimates Task uses the information produced by the other tasks to estimate the radiation doses populations could have received from Hanford radiation.

Project reports and references used in the reports are made available to the public in a public reading room. Project progress is documented in this monthly report, which is available to the public.

 

Project Summary

Progress

Figure A.1 in Appendix A shows the status of project milestone activities. The following is a summary of activities conducted by HEDR staff in April 1991:

- presented project status information at the Lewiston TSP meeting, including TSP Subcommittee meetings. Battelle presentations described the status of Phase I reports and project model development.
- provided the TSP with revised task plans for FY 1991 work. The task plans were approved and published.
- provided a project summary schedule as the basis for contract discussions between Battelle and the Centers for Disease Control (CDC) for continuation of the project
- conducted a feasibility study of computing project doses on a Sun computer system. Results indicated computation times are within time constraints of the project.
- compiled a list of model parameters showing current distribution type and distribution values
- participated in a meeting of the Native American Working Group
- sent the following Phase I reports to the TSP for final approval:
 - "Summary of Literature Review of Risk Communication - Hanford Environmental Dose Reconstruction Project" (Milestone 1201B)
 - "Estimates of Columbia River Radionuclide Concentrations: Data for Phase I Dose Calculations" (Milestone 0401B)
 - "Fission Project Iodine During Early Hanford-Site Operations: Its Production and Behavior During Fuel Processing, Off-Gas Treatment and Release to the Atmosphere" (Milestone 0301E)
- received TSP approval on, and published, the following Phase I reports:
 - "A Preliminary Examination of Audience-Related Communications Issues for the Hanford Environmental Dose Reconstruction Project" (Milestone 1201A)
 - "Evaluation of Thyroid Radioactivity Measurement Data from Hanford Workers, 1944-1946" (Milestone 0701A)
- found historical documents that provide daily records of B and T plant dissolver operations from 1944-1947. The data are being used to continue reconstruction of dissolver operations as part of Milestone 0302A, Documented Phase I Iodine-131 Releases.
- completed research on Task 0303 (Significant Airborne Releases 1944-1957) and Task 0304 (Significant Waterborne Releases 1944-1957). Timelines of reference sources were developed for airborne and waterborne releases, and supplementary material was identified on historical measurement techniques and fuel element failures.
- continued to revise and test the revised atmospheric transport code, including incorporating the results of the atmospheric model working group meeting
- reviewed U.S. Geological Survey groundwater information for the Franklin County side of the Columbia River and reviewed five University of Washington theses on Columbia River data
- began updating the Environmental Monitoring Document Database to add documents reviewed in Phase I
- sent requests for proposals to Coeur d'Alene, Kalispel, Nez Perce, Umatilla and Colville tribes for data collection
- provided a letter report to J. Till, TSP Chairman, describing Battelle's document search and declassification process in Phase I of the project
- completed declassification review of all documents on the TSP multiple-request list of documents. Ten documents still require some deletions.

- distributed requests for proposals to six Northwest vendors for the production of the TSP video and reviewed the draft video script
- incorporated TSP comments on candidate survey questions. These questions will be part of a Washington State University omnibus survey of regional residents to help the TSP evaluate the effectiveness of its public outreach program.
- provided information and material in response to requests for information from citizens in Prosser and Cashmere, Washington

Problems or Changes and Action Taken

DOE-RL re-prioritized Hanford contractor document declassification efforts to support U.S. Department of Justice legal defense activities in behalf of DOE relative to pending lawsuits. The TSP and CDC will pursue clarification of this reprioritization, which slowed down, for several weeks, declassification of documents important to the HEDR Project.

The decision to issue a design specification that is specific and includes the results of current investigations (including machine dependencies and database structure questions) has impacted the efforts and schedule of Milestone 0202A (Draft Code Design Specifications).

The TSP has formed a new subcommittee to oversee functions that apply to all project technical areas: technical integration, quality assurance, statistics and dosimetry. The HEDR Project has existing tasks in these areas.

Planned Work for the Next Three Months

- finalize all Phase I reports
- prepare FY 1992 task plans and network diagrams showing activity relationships for the remainder of the project
- submit an integrated project plan, with cost estimates, to the TSP for review
- submit the following milestones to the TSP for review and approval:

- code design specifications for revised dose model (Milestones 0202A and B)
- documentation of Phase I iodine-131 releases (Milestone 0302A)
- documentation of airborne and waterborne radionuclides through 1957 (Milestones 0303A and 0304A)
- wind field modeling white paper (Milestone 0402A)
- report on air model variability (Milestone 0402E)
- revised QA plan (Milestone 10A)
- letter report on communications assessment research (Milestone 1203A)
- continue design and coding efforts for the restructured air pathway model and code
- continue groundwater studies, including dose calculations for watershed runoff impacts and review of groundwater migration
- collect and inventory additional Columbia River monitoring data and vegetation data
- begin work on revised milk model to support Hanford Thyroid Disease Study
- develop a procedure for specifying distributions and dependencies of model parameters
- continue to declassify documents from the TSP-prioritized listing
- present several HEDR-related papers at the June American Nuclear Society meeting

Budget Status

Figure 2 shows the budget status of the HEDR Project. Table A.1 in Appendix A shows FY 1991 costs and budget by task and subtask. Figure A.2 shows TSP budget status.

The funding source for the HEDR Project has changed within DOE from Hanford Site Landlord activities to Epidemiologic Activities under Environment, Safety, and Health, as an interim step towards the process of transferring the funding to the Centers for Disease Control.

FIGURE 2. HEDR Project Budget Status - Pacific Northwest Laboratory

Capital Status

\$29K of capital funding was approved for the procurement of a Sun computer system. The \$29K plus \$106K of carryover gave the project a total of \$135K capital funding for FY 1991.

1. The first part of the report
 2. The second part of the report
 3. The third part of the report
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Chapter 2

Chapter 3

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Task 01 PNL Project Management

Objective

The objective of the PNL Project Management Task is to provide project planning, control, and management of PNL dose reconstruction work in accordance with TSP direction.

Progress

Milestone 0101A - Near-Term Project Plan, due November 1990 and completed; Mid-Year Review and Planned Add-on Work, due April 1991 and completed

- provided revised task plans for FY 1991 for TSP approval at the Lewiston TSP meeting. The task plans, which reflect results of the Seattle TSP planning/budget workshop and address data quality objectives, were approved by the TSP, published, and distributed.

Milestone 0101B - Integrated Project Plan, due July 1991

- provided a project summary schedule for discussion with TSP members and Centers for Disease Control (CDC) staff at the Lewiston TSP meeting. The plan includes a schedule, end products, key milestones, scopes of major activities, durations, assumptions and constraints. The plan will be the basis for a contract between Battelle and the CDC for continuation of the project.

Milestone 0102A - Final Phase I Reports (Summary, Air, River) - Due May 1991

- continued to respond to TSP comments

Other Activities

- reviewed, with Task 11 staff, the current HEDR document search and review process, including a tour of the Hanford Technical

Library and 712 Buildings where documents are stored. Provided a letter report to J. Till, TSP Chairman, describing Battelle's search and declassification process for Phase I of the project.

- reviewed a proposed FY 1992 contract clause defining Battelle and TSP roles for the contract with CDC
- met with about two dozen line managers of HEDR task and subtask leaders to discuss the status of the project and plans for out-year work

Major Problem Areas or Changes and Action Taken

None.

Variance

The cumulative underrun was caused by a delay in issuing the final Phase I reports (Task 0102). The variance will be used to complete this task.

Planned Work for the Next Three Months

- finalize Phase I reports
- complete integrated project plan
- complete FY 1992 task plans for TSP review and approval □

THESE ARE THE RESULTS OF THE
ANALYSIS OF THE SAMPLES
OBTAINED FROM THE FIELD

DATE: 10/10/10

ANALYST: J. J. J. J.

LABORATORY: J. J. J. J.

THE RESULTS OF THE ANALYSIS
INDICATE THAT THE SAMPLES
OBTAINED FROM THE FIELD
CONTAIN THE FOLLOWING
CONCENTRATIONS OF THE
VARIABLES STUDIED:

1. THE CONCENTRATION OF
THE VARIABLE STUDIED IS
HIGHER THAN THE
REFERENCE VALUE.

2. THE CONCENTRATION OF
THE VARIABLE STUDIED IS
LOWER THAN THE
REFERENCE VALUE.

3. THE CONCENTRATION OF
THE VARIABLE STUDIED IS
EQUAL TO THE
REFERENCE VALUE.

END

THE RESULTS OF THE ANALYSIS
INDICATE THAT THE SAMPLES
OBTAINED FROM THE FIELD

CONTAIN THE FOLLOWING

CONCENTRATIONS OF THE

VARIABLES

STUDIED:

1.

2.

3.

4.

5.

6.

THE RESULTS OF THE ANALYSIS
INDICATE THAT THE SAMPLES
OBTAINED FROM THE FIELD

END

Task 02 Technical Integration

Objective

The objective of the Technical Integration Task is to provide technical overview of the project to ensure that appropriate technical activities are planned, that appropriate information is generated, and that technical task work is integrated effectively for performing the final dose calculations.

Progress

Milestone 0201A - Dominant Radionuclides Final Report, due April 1991 and rescheduled to May 1991

- addressed TSP comments and submitted the report to the HEDR Project Office for processing

Milestone 0201B - Model Specification Final Report, due April 1991 and rescheduled to May 1991

- addressed TSP comments and submitted the report to the HEDR Project Office for processing

Milestone 0202A - Draft Code Design Specifications, due April 1991 and rescheduled to May 1991

- implemented a bench-scale code on a Sun workstation to solve the five differential equations forming the portion of the restructured air pathway model that calculated iodine-131 concentration in soil and vegetation over time. For evaluation and timing, the code was programmed to read the air transport model output from a file and to calculate the daily average concentrations for one vegetation type (grain) at two locations for 62 days (July and August of 1945), repeated for ten Monte Carlo realizations. With no output, the code was completed in approximately 0.05 seconds elapsed time (time required for the calculations only). When statements were added to write the results to a direct-access unformatted

(binary) file, the run time increased to approximately 1.2 seconds. Thus the length of time to run the soil/vegetation portion of the full-scale restructured air pathway model for 100 Monte Carlo runs covering the 1945-1947 time span (1095 days) and the 31 x 31 grid coverage (961 locations) will be almost entirely determined by the time required to output the results to the "intermediate results" (environmental concentrations) database. Extrapolating from the dimensions of the bench-scale code and assuming we can minimize the effects of paging from large arrays by accessing elements of the arrays in their stored order, the full-scale code can be estimated to take approximately 9-1/2 days of elapsed time on a similar Sun workstation. Including the concentrations in animal products adds another eight variables to be calculated and output (algebraic equations only, no integrations), so the total run time could be expected to roughly double, to approximately 19 days. Running the model on the new dedicated HEDR Sun, with a faster CPU and much faster disks, will reduce this time considerably, perhaps by as much as a factor of two. The conclusion is that the run time for this portion of the enhanced air pathway model on the Sun computer will be well within acceptable limits. Results of the Sun system feasibility study are being documented.

- began preparing paperwork for purchasing the Sun computer system. The system is expected to be operational by September 30, 1991. Smaller-capacity Sun systems currently available at PNL can be used during FY 1991 to develop and test the revised dose code.

- began preparing for operation of the new Sun system (location and maintenance)
- compiled a list of model parameters showing current distribution type and distribution parameters. This list is needed to begin the process of establishing parameter distributions and correlations for the model.

Milestone 0202C - Model Correlations Analysis Report, due February 1991 and completed

- received and began addressing TSP comments

Other Activities

- worked on development of a long-range project plan for use in a meeting with TSP and CDC in Atlanta in May

Major Problem Areas or Changes and Action Taken

The continued efforts on Milestone 0202A (Draft Code Design Specifications) were originally anticipated to be expended on the code development. The efforts are necessary and, in general, were anticipated, but the current source of funding, the design specifications, was not. It was decided to issue a design specification that is specific and includes the results of current investigations (including machine dependencies and database structure questions).

Variance

The cumulative overrun was caused by planning efforts between October 1990 and January 1991

that were larger than originally anticipated when spending plans were formulated. Native American Working Group support was charged inadvertently to Task 02 rather than Task 06. A cost correction will be processed in May and reflected in the May monthly report. Additionally, procurement and subcontract expenses for Geographic Information System support that were thought to be billed during FY 1990 were billed during 1991, as described last month.

Planned Work for the Next Three Months

- prepare code design specifications for restructuring computational model
- continue coordinating efforts with Hanford Thyroid Disease Study Personnel
- work with the International Atomic Energy Agency Coordinated Research Program on Validation of Model Predictions (VAMP) to validate portions of the HEDR model and obtain independent estimates of certain doses
- revise model correlations analysis report (Milestone 0202C) to address TSP comments; send final report to TSP for review and approval
- proceed with purchase of the Sun computer system □

Task 03 Source Terms

Objective

Source terms are the amount and type of radioactive materials released to the environment. Members of the Source Terms Task develop estimates of radioactive emissions since 1944 from Hanford facilities based on historical measurements and production information. Source term estimates are used by Environmental Transport Task members to reconstruct the concentrations of radionuclides in the environment.

Uncertainty in calculated and measured data can result from many factors. Uncertainties in measured emissions may result from early measurement techniques. For calculated emissions, uncertainties may result from the differences in published variables that are used to perform calculations. By comparing the uncertainty in the available data, Source Term Task staff determine the most accurate method for developing source terms. For time periods where measured values do not exist, source terms are calculated from available information. The proposed methods and results of this task are reviewed, evaluated, and approved by the TSP.

Progress

Milestones 0301E - Iodine Behavior
Final Report, due April 1991 and completed

- sent this report to the TSP Chairman for final approval before publishing

Milestone 0302A - Documented Phase I Iodine-131 Releases, due May 1991 and rescheduled to July 1991

- continued reconstruction of dissolver operations. Recently discovered historical documents provide essentially daily records of B and T Plant dissolver operations. These records are complete for 1944-1947, except for a 5-month period for which a more generic treatment will have to be used. The reconstruction of dissolver operations is sufficiently

detailed to warrant writing a small code to perform the calculations. The code will be more auditable and reliable than the spreadsheet method originally envisioned for this task.

Milestone 0303A - Documented Significant Airborne Radionuclides, 1944-1957, due July 1991 and **Milestone 0304A - Documented Significant Waterborne Radionuclides, 1944-1957**, due July 1991

- completed research on Task 0303 (Significant Airborne Releases 1944-1957) and Task 0304 (Significant Waterborne Releases 1944-1957). Timelines of reference sources were developed for airborne and waterborne releases, and supplementary material was identified on Health Instruments Department measurement techniques and fuel element failures.

Milestone 0305A - Iodine-131 Release Model Report, due FY 1992

- held initial discussions with Statistics Task members regarding Task 0305 (Source Term Model) development

Major Problem Areas or Changes and Action Taken

The extra detail of the dissolver operation reconstruction in Task 0302 (Iodine Closure) is taking longer, and may require more resources, than anticipated. Completion of the draft document for this milestone will be delayed to July. The key interaction of this milestone with other tasks is the delivery of input files for the dose model in mid-September. A delay to July will have no impact on that milestone.

Variance

The cumulative cost underrun was reduced this month as a result of catch-up work required in all

Source Term subtasks. All milestones appear to be feasible except for Task 0302 (Iodine Closure), which will be delayed but will not impact other milestones.

Planned Work for the Next Three Months

- complete work on Task 0302 (Iodine Closure)
- begin documentation for Task 0303 (Significant Airborne Releases) and Task 0304 (Significant Waterborne Releases)
- begin work on Task 0305 (Source Term Release Model) □

Task 04 Environmental Transport

Objective

Members of the Environmental Transport Task reconstruct the movement of radioactive materials (the source term information) from the areas of release to the environment. Radionuclide movement via the atmosphere, Columbia River, and ground water are studied.

To track releases to the atmosphere from Hanford Site operations, meteorological data are needed, including wind speed, wind direction, and other data that affect the dispersion of the releases. Mathematical models are applied to these meteorological data and the source term data to calculate concentrations of radionuclides in the air and on the ground. The TSP reviews, evaluates, and provides direction concerning the proposed models.

Reconstruction of the transport of radionuclides in the Columbia River is based primarily on historical studies of the Columbia River and its tributaries. Computer models are used to reconstruct radionuclide concentrations in the river for time periods when previously published data are limited or unavailable.

The movement of radionuclides in the ground water is reconstructed initially by using ground-water monitoring data to estimate the contribution to the Columbia River exposure pathway. Modeling will be used where previously published data are lacking.

Progress

Milestone 0402A - Wind Field Modeling White Paper, due April 1991 and rescheduled to June 1991

- continued work on wind field models. Both wind field models are now working. Wind fields and concentration fields produced using the models are being compared.

Milestone 0402B - MESOILT2 Version 2.0 Report, due FY 1992

- continued to revise and test Version 2.0 of the MESOILT2 atmospheric transport code; worked on the report, including incorporating the results of the atmospheric model working group meeting

Milestone 0402C - Report on Air Model Sensitivity/Uncertainty, due FY 1992

- continued work on the uncertainty associated with imprecision in wind data

Milestone 0402E - Report on Air Model Variability, due April 1991 and rescheduled to June 1991

- obtained and began addressing PNL peer-review comments

Milestone 0403A - Groundwater Report, due FY 1992

- completed draft report describing approach/ results of well analysis. Presented results of the well analysis activity to the Environmental Transport Subcommittee at the TSP meeting in Lewiston, Idaho.
- continued work on watershed runoff calculation (95% complete). The remaining work consists of dose calculations resulting from those concentrations. A draft chapter for the final report has been completed, except for the dose calculations. Presented results of the watershed calculation to the Environmental Transport Subcommittee at the TSP meeting in Lewiston, Idaho.
- reviewed information for groundwater on the Franklin County side of the Columbia River to the east and north of the Hanford Site. Water levels reported by the U.S. Geological Survey, summarized in a contour map, indicate that groundwater in the unconfined aquifer on both sides of the Columbia River discharges to the river. This implies that radionuclides in the unconfined aquifer on the Hanford Site discharge to the Columbia River, rather than migrate to wells on the Franklin County side of the river. The data are summarized from 1989 measurements.

Milestone 0404A - Columbia River Data, 1944-1989, due FY 1992

- continued reviewing available literature, including five theses from the University of Washington. Three of the theses contained data and information relevant to the HEDR Project. The general subject matter included studies of zinc-65 in clays at Willapa Bay and phosphorus-32 at the mouth of the Columbia River.

Major Problem Areas or Changes and Action Taken

The accelerated schedule for revision of the atmospheric model and project planning has caused a delay in the revision of the remaining Phase I reports on the atmospheric model.

Wind field model evaluation is underway. The model report will be delayed, but it is not a critical-path item.

Milestone 0402E (Report on Air Model Variability) was rescheduled from April to June 1991 to allow time for final revisions and PNL reviews. No impact on other work is anticipated.

Dose calculations for Milestone 0403A (Groundwater Report) have not been completed. Radionuclide concentrations for the dose calculations will be provided to staff from Task 07 so the calculations can be completed early next month.

Variance

The cumulative cost underrun was caused by the revised air model not yet being ready for sensitivity or uncertainty analyses and by the inclusion of planning activities under another task. Funding for Task 0403 (Groundwater Transport) will be redistributed because it now has one report (rather than the previously planned three).

Planned Work for the Next Three Months

- finalize the remaining Phase I reports
- continue evaluation of wind field interpolation methods
- continue restructuring of atmospheric code to be consistent with the overall dose assessment code
- resume work on preparing databases for use with the revised atmospheric model
- complete the chapter on watershed runoff calculations in the groundwater transport document by including a description of the dose calculations
- review and summarize groundwater documents from the Hanford Site for the chapter on offsite migration
- continue literature and data review for Columbia River data □

Task 05 Environmental Monitoring Data

Objective

Members of the Environmental Monitoring Data Task assemble, evaluate, and summarize key historical measurements of the concentrations of radionuclides in the environment around the Hanford Site. Radionuclide concentrations have been measured at various times in air, drinking water, foods, fish, the Columbia River, soil, and in other materials. These measurements are evaluated to estimate their accuracies and then used by Environmental Pathways and Dose Estimates Task staff to estimate radiation doses and by Environmental Transport Task staff to calibrate computer models. Methods to attain this objective are proposed to the TSP for review, evaluation, and approval.

Progress

Milestone 0502A - Vegetation Data Report, due September 1991

- continued efforts to establish subcontract with key staff. The contract is expected to be finalized during May. However, because of previous commitments, the consultant will not be available until July. This is slightly later than originally anticipated, which will result in a lag in budget expenditures. No impact on the completion of the milestone is expected as a result of this delay.

Monitoring Document Search and Inventory (Task 0503)

- began updating the Environmental Monitoring Document Database. Existing document entries will be expanded and documents backlogged earlier in the project because of redirection of funds will now be entered into the database.

Surface Water Data (Task 0404)

- Technical activities are conducted in support of Subtask 0404, Task 04, Environmental Transport, and are reported under that section.

Major Problem Areas or Changes and Action Taken

Other demands for staff time are delaying work on the vegetation monitoring data subtask. This is a short-term problem; staff will become available in the near future. In addition, management has begun the process of acquiring additional staff to cover the work load. Impacts on HEDR milestones should be negligible.

Completion of Milestone 0501A, Environmental Monitoring Data Final Report, has been rescheduled to May 1991 because of other HEDR planning work.

Variance

The cumulative cost overrun was caused by subtask work being delayed because of staff availability, as described above.

Planned Work for the Next Three Months

- finalize Phase I report on environmental monitoring data

- collect and inventory additional Columbia River monitoring data
- collect and inventory additional vegetation data and initiate evaluate of assumptions used in determining uncertainty factors ☐

Task 06 Demography, Food Consumption and Agriculture

Objective

Task members develop the demographic, food consumption, and food production information needed to estimate doses. Demographic information for populations that may have been exposed to radionuclides during the time period of interest is developed for the general population and for several special population groups that are not adequately represented by the U.S. Census. These groups include Native American tribes, Army personnel stationed at Hanford, some Hanford construction workers, and migrant workers.

Sources and quantities of food and water consumed by these populations must be estimated, because food and water provide pathways for the intake of radionuclides. In particular, milk produced from cows represents a significant food pathway for iodine-131 if the cows ate vegetation contaminated with radionuclides. Dairy farming practices and milk distribution systems are studied to identify the populations that may have consumed potentially contaminated milk.

Methods to collect data and to estimate population densities and food consumption have been proposed to the TSP for review, evaluation, and approval.

Progress

**Milestone 0602A - Dose Estimates,
2 Tribes, due December 1990 and
completed**

- sent requests for proposals (RFPs) to the Coeur d'Alene and Kalispel tribes to do follow-on research
- sent RFPs to the Nez Perce, Umatilla, and Colville tribes for work orders to do data collection
- participated in a meeting of the Native American Working Group in Lewiston (Task 02 staff). The TSP and the tribes continue to work out a policy for release of Native American dose estimates.

Major Problem Areas or Changes and Action Taken

None.

Variance

The cumulative cost underrun resulted from a delay in tribal work. The Native American Working Group has completed development of a process for completing the data collection. Work orders are now being placed for data collection activities. A key staff member, D. Beck, will soon return from a temporary assignment in Washington, D.C. to initiate the milk model work approved this month.

Planned Work for the Next Three Months

- finalize Phase I reports
- attend Native American Working Group meetings (Task 02 staff)
- initiate work on revisions to Phase I milk model
- initiate milk model work to support the Hanford Thyroid Disease Study
- seek out two additional milk distribution experts to refine feeding regime estimates ☐

Task 07 Environmental Pathways and Dose Estimates

Objective

Task members use calculated and measured concentrations of radionuclides provided by members of the Environmental Transport Task and the Environmental Monitoring Data Task to calculate doses to populations, typical individuals, and specific individuals. These calculations include doses via direct transfer of radionuclides from concentrations in air and water to people (such as via breathing, drinking, and immersion). The calculations also include doses from radionuclide concentrations in air and water transferred through environmental pathways, such as soil, plants, animals, and fish, to people. All significant decisions on exposure models and input parameters are presented to the TSP for review, evaluation, and approval.

Progress

Milestone 0701A - Thyroid Worker Data Final Report, due April 1991 and completed

- completed milestone. Final printing is under way.

Milestone 0702A - Air Pathway Dose Code Documentation, due FY 1992

- continued working with Tasks 02 and 08 to evaluate hardware and software requirements for the revised air pathway model and code
- continued coding efforts on the revised air pathway model and code
- began compiling a list of model parameters showing current distribution type and distribution parameters. The list is needed to begin the process of establishing parameter distributions and correlations for the revised model.

Milestone 0703A - Model Parameters Report, due FY 1992

- began full-time work on Task 0703 (Model Parameters). The literature review of transfer factors was re-initiated and will expand the search for published transfer factors applicable to the Hanford environs. Efforts this month were focused on iodine-131 for the Phase I air pathway report, as well as ruthenium-103, ruthenium-106, and plutonium-239 for future air pathway work. Efforts are also under way to develop model parameter evaluation criteria.

Major Problem Areas or Changes and Action Taken

A new staff member began work on the HEDR Project. Sandra Shindle, a research scientist in the Health Physics Department, will be responsible primarily for completing work in Subtask 0703, Model Parameters.

Variance

No significant cumulative variance.

Planned Work for the Next Three Months

- continue design and coding efforts for the restructured air pathway model and code; finalize code design details (Milestone 0702A)

- support Task 02 in completing design specification document for revised air pathway code (Milestone 0202A)
- continue work on documenting air pathway radionuclide transfer factors and expand the work to river pathway radionuclides (Milestone 0703A) □

Task 08 Statistics

Objective

Task members provide statistical support to members of technical tasks and develop and apply sensitivity and uncertainty analyses. Sensitivity analyses will be used to identify parameters with the greatest influence on dose estimates. Using sensitivity analyses results, project staff can focus resources where the benefit in terms of accurate dose estimates is greatest. Uncertainty analyses enable task leaders to determine the extent to which the accuracy and precision of the dose estimates are influenced by accuracy and precision in the input parameters.

Progress

Task Assistance (0802)

- held discussions with task leaders to obtain information for developing draft Statistics Task subtasks and activities for the remainder of the HEDR Project
- met with the Source Terms Task leader to begin work on incorporating uncertainty into the source term model
- met with the Information Resources Task leader, HEDR Project Manager, and Technical Integration Task leader to document past document search and declassification activities. Meeting notes were organized and sent to the HEDR Project Office as input to a letter from D. Shipley to J. Till (Chairman of TSP) regarding document search strategy used thus far by PNL.
- began developing a detailed procedure to be used by PNL for specifying distributions of model parameters in HEDR Project source term, environmental transport, and dose models
- sent responses to TSP comments to the HEDR Project Office on Phase I reports (Summary Report, Columbia River Pathway Report, Air Pathway Report) to clarify interpretation of preliminary thyroid dose curves for populations

- conducted activities in support of Task 02 (Technical Integration) and Milestones 0402C and 0402E of Task 04 (Environmental Transport) as reported under Tasks 02 and 04

Major Problem Areas or Changes and Action Taken

Work was delayed on Milestone 0802A (Iodine-131 Conversion Factor Report) because the contract with E. Mart (consultant and expert on topic) was not finalized. The contract is expected to be finalized by the middle of next month.

Variance

No significant cumulative variance.

Planned Work for the Next Three Months

- provide guidance and review for development of data quality objectives for activities for the remainder of the HEDR Project
- revise the Phase I report on the uncertainty in the factor that converts historical iodine-131 gross beta measurements from counts per minute to disintegrations per minute (Milestone 0802A, due to the TSP September 1991)

- assist Task 03 (Source Terms) in incorporating uncertainty into the source term model
- develop and document a detailed procedure for specifying distributions and dependencies of model parameters
- continue to conduct work with Task 02 (Technical Integration) and Task 04 (Environmental Transport) in support of Milestones 0402C and 0402E (reports on air model sensitivity and variability) □

Task 09 Records Management

Objective

Members of the Records Management Task 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 the TSP.

Progress

- received project records from the HEDR Project Office (95 records/1,573 pages)
- verified, processed, and stored project records (310 records/5,507 pages)
- transferred two packages of records to the DOE-RL Public Reading Room (13 records/720 pages)

Major Problem Areas or Changes and Action Taken

None.

Variance

The cumulative cost underrun is left over from work delayed pending new staff training. The underrun is expected to be gradually absorbed as accumulated records are processed.

Planned Work for the Next Three Months

- continue processing incoming project records
- continue transferring processed project records to the DOE-RL Public Reading Room ☐

Task 10 Quality Assurance

Objective

The objective of this task is to ensure continuous quality assurance (QA) support and coordination with all project tasks. This objective is 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

Milestone 10A - Revised QA Plan, due April 1991 and rescheduled to May 1991

- incorporated initial review comments of the draft revised HEDR QA Plan (OHE-3, Revision 4)
- initiated oversight activities with key task leaders to check for compliance with the technical QA, and data quality objective requirements

Major Problem Areas or Changes and Action Taken

Milestone 10A (Revised QA Plan) has been drafted and is undergoing internal HEDR review. The QA Plan will be issued in May 1991.

Variance

The cumulative cost underrun was caused primarily by minimal quality engineering assistance and surveillance because most of the work performed

to date has been related to planning activities. This variance will be corrected within the next few months as the QA planning documents are finalized and the work associated with establishing out-year data quality objectives increases.

Planned Work for the Next Three Months

- issue remaining HEDR procedure: HEDR-TP-3, "HEDR Documentation of Critical Decisions"
- issue revised QA Plan
- continue performing oversight activities to check for compliance with project technical, QA, and data quality objective requirements ☐

Task 11 Information Resources

Objective

Members of the Information Resources Task work with the other task members to meet information needs, including ensuring that all data referenced in the reports are publicly available and establishing a microcomputer-based tracking system for ready retrieval of historical information.

Progress

Information Resources Task Management (Subtask 1101)

- added a part-time staff member to assist P. Cleavenger and learn the HEDR Clerical Assistant's duties and responsibilities. Cleavenger will continue to work on a limited call-in basis during the remainder of FY 1991.

Declassification (Subtask 1102)

- completed declassification review of all documents on the TSP-prioritized multiple-request list. Ten documents still require some deletions. Appendix B and its addendum identify the specific documents declassified this month. Table 11.1 shows the status of declassification to date.
- worked with M. Robkin, TSP, to review classified documents of potential use to the project. He was on site for two days during the month.

Resource Identification and Availability (Subtask 1103)

- added new citations to the tracking system that now contains nearly 4500 publications
- provided the DOE-RL Public Reading Room with 21 documents of potential interest/use in the HEDR Project. A title listing of these reports is given in Appendix B.

- filled information requests for M. Robkin, B. Shleien, S. Davis (all TSP members), and numerous HEDR staff
- conducted a detailed briefing on information search procedures for selected key HEDR staff. The briefing included explaining the strategy for identifying literature of interest to specific HEDR tasks and ensuring a high degree of completeness. The briefing included tours of both the 3760 Building reports collections and the Records Holding Area in the 712 Building.

DOE-RL Public Reading Room Activity

- Eight people requested seven HEDR-related documents in April.

Major Problem Areas or Changes and Action Taken

Task staff identified and declassified a number of hand-written ledgers containing information of very significant value to Task 03 (Source Terms). The 1945-1947 data now lack individual run information for only 5 months. We previously had about 50% of the runs. It is unlikely that we will be able to locate data for the missing 5 months.

Based on his review of several years of Hanford monthly reports (350-400 total pages), TSP member M. Robkin suggested that these reports be placed in the queue and not be reviewed for declassification if the same information can be

TABLE 11.1. Declassification by Task 11 Staff for the HEDR Project (1944-1960 Documents)

<u>Document Type</u>	<u>Number</u>	<u>Comment</u>
Total classified Hanford documents in 6/90	11,000	Title list made available to TSP, states, and interest groups
Subset of the 11,000 requested for declassification by TSP, states, and interest groups	2,000	Only about 1450 of these were actually unique documents; the rest were double-numbered, previously declassified, or originated as unclassified
Number of documents from the 1450 requested by more than 1 person	367	
Number of documents of the 1450 requested by 1 person	1083	
Number out of the 367 that were deemed to be of no interest to the public or the project, per TSP member M. Robkin	120	
Multiple-request documents	247	All declassified; list in DOE-RL Public Reading Room
Total documents declassified to date for HEDR	810	Since March 1987 when HEDR declassification first began
Documents declassified for HEDR in FY 1988 (October 1987 through September 1988)	37	List in Reading Room
Documents declassified for HEDR in FY 1989 (October 1988 through September 1989)	177	List in Reading Room
Documents declassified for HEDR in FY 1990 (October 1989 through September 1990)	236	Reported in HEDR monthly report; list in Reading Room
Documents declassified for HEDR in FY 1991 to date (October 1990 through April 1991)	360	Reported in HEDR monthly report; list in Reading Room. Some of these are part of the 247 multiple-request documents shown above.

identified in other documents already in the public domain or in more readily declassifiable documents.

Variance

The cumulative cost overrun will be used for double staffing necessary to train a new information specialist. Additional staff costs for declassification will be reflected during the ensuing months.

Planned Work for the Next Three Months

- identify data needed to complete Task 03 timeline production/throughput graph
- continue to add input to the information resources tracking data base and provide documents to the DOE-RL Public Reading Room in an orderly, timely fashion

- watch for information that may explain in detail, and support data in, "green run" document HW-17381 DEL
- identify significant documents that address fuel element failures that occurred in now-decommissioned Hanford production reactors
- continue to identify and collect documents and/or data that address radioactive materials released to the environment during the years from reactor startup through 1957
- continue to develop "packing lists" to identify contents of boxes of retired Hanford records of potential interest/ use to the project
- identify and collect documents that address reactor purges, 1944-1957
- from the prioritized list of Hanford Site-originated classified documents, declassify, with or without deletions, those documents reviewed by M. Robkin and identified as being of use to the project □

Task 12 TSP Communications Support

Objective

The objective of this task is to assist the TSP in developing and implementing communications strategies to further establish an effective, informative dialogue with interested audiences, provide public and media relations support, and manage activities that foster a better understanding of the HEDR process and its progress.

Progress

Milestone 1201A - Audience Analysis Final Report, due April 1991 and complete

- sent Phase I report to the TSP for final approval

Milestone 1201B - Risk Communication Final Report, due April 1991 and complete

- received TSP approval on and published this Phase I report

Milestone 1202B - TSP Videotape, due July 1991

- distributed request for proposal to six Northwest vendors in late April for the production of the TSP video. Review of responses is scheduled to begin in June.
- reviewed the draft video script prepared by TSP staff

Milestone 1203A - Letter Report on Communications Assessment Research, due June 1991

- received and began reviewing proposed questions relating to the Hanford Thyroid

Disease Study (HTDS) from B. Amundson, Fred Hutchinson Cancer Research Center. The questions, which deal with public understanding of the HEDR work versus HTDS studies, are proposed for inclusion in the upcoming TSP communications survey. Comments from TSP members on candidate questions were also addressed.

- discussed sampling times and contract issues with Washington State University, which will conduct the survey now scheduled for May.

Other Activities

- reviewed and submitted comments to TSP staff on the draft TSP FY 1992 Public Information Plan
- provided TSP staff with additional information in the development of an information poster. The poster will be used to invite citizens to public meetings, identify project purpose/goals, and tell where to get more information.
- reviewed technical aspects of TSP draft fact sheet on the 1949 "green run." Provided a revised draft of a Northwest map for review to M. Robkin, TSP Communications Subcommittee. The map, which depicts possible contamination areas in 1940s, will be used in the fact sheet.

- provided information and materials in response to citizen requests from Prosser and Cashmere, Washington

Major Problem Areas or Changes and Action Taken

Computer equipment purchases for communications use by Washington Department of Ecology staff (TSP communication staff) is being reordered. The previously ordered equipment was determined unsuitable for its application.

Variance

A cost underrun resulted from delays in videotape development and communications assessment

research. The underruns are expected to be absorbed as activities regain full momentum in the next several months.

Planned Work for the Next Three Months

- continue support of TSP videotape, poster, and computer equipment purchase as directed by the TSP Communications Subcommittee
- provide audiovisual support for the July TSP public meeting ☐

Appendix A
Milestones, Schedule and Costs

FIGURE A.1. HEDR Project Milestones

FIGURE A.1. HEDR Project Milestones (contd)

TABLE A.1. Cost Summary (Dollars in Thousands) (a)

	April 1991			FY 1991 to Date (October 1990 - September 1991)							
	Labor \$	Non-Labor \$ (a)	Total \$	Labor \$	Non-Labor \$ (b)	Total \$	Cum Budget	Cum Variance	TSP Approved FY Budget	Budgeted FY Labor Hours	
HEDR Project Tasks											
Task 01 - Project Management (c)											
0101 Project Control	49	14	63	282	97	379	379	0	662	5,883	
0102 Final Phase I Reports	3	3	6	53	3	56	98	42	114	991	
0103 Records Control	6	0	6	42	1	43	40	-3	70	1,418	
0104 Peer Review	0	0	0	7	0	7	8	1	14	130	
0105 Subcontract Administration	3	0	3	14	0	14	15	1	25	411	
0106 Project Communication Sup	10	2	12	58	6	64	58	-6	99	1,489	
Subtotal Task 01	71	19	90	456	107	563	598	35	984	10,322	
Task 02 - Technical Integration											
0201 Task Mgmt/Proj Integration	8	0	8	67	21	88	53	-35	90	920	
0202 Code Design Specification	9	0	9	77	3	80	84	4	119	1,186	
0203 IAEA Model Intercompar.	1	0	1	27	6	33	30	-3	51	370	
Subtotal Task 02	18	0	18	171	30	201	167	-34	260	2,476	
Task 03 - Source Terms											
0301 Task Management	0	1	1	12	2	14	13	-1	20	165	
0302 Closure of Phase I Iodine Rel	5	0	5	21	0	21	24	3	29	253	
0303 Airborne Isotopes not I-131	3	0	3	10	-1	9	14	5	22	128	
0304 Waterborne Isotopes (44-57)	4	0	4	10	0	10	13	3	22	128	
0305 Source Term Release Model	0	0	0	0	0	0	0	0	40	419	
Subtotal Task 03	12	1	13	53	1	54	64	10	133	1,093	

TABLE A.1. Cost Summary (Dollars in Thousands) (a)

April 1991				FY 1991 to Date (October 1990 - September 1991)						
	Labor \$	Non-Labor \$ (a)	Total \$	Labor \$	Non-Labor \$ (b)	Total \$	Cum Budget	Cum Variance	TSP Approved FY Budget	Budgeted FY Labor Hours
Task 04 - Environmental Transport										
0401 Task Management	3	0	3	29	2	31	24	-7	43	400
0402 Atmospheric Transport	24	2	26	116	7	123	178	55	322	3,544
0403 Groundwater Transport	3	0	3	25	1	26	43	17	59	654
0404 Surface Water Transport	3	0	3	24	2	26	62	36	142	1,771
Subtotal Task 04	33	2	35	194	12	206	307	101	566	6,369
Task 05 - Environmental Monitoring Data										
0501 Task Management	0	0	0	0	0	0	0	0	0	0
0502 Vegetation Data	0	0	0	1	0	1	4	3	62	405
0503 Monitoring Doc Search/Inver	0	0	0	0	0	0	2	2	10	139
Subtotal Task 05	0	0	0	1	0	1	6	5	72	544
Task 06 - Demographics, Food Consumption, & Agriculture										
0601 Task Management	2	0	2	22	1	23	20	-3	30	365
0602 Prelim Native American Data	1	0	1	45	-7	38	165	127	232	851
0603 Milk Model Refinements	0	0	0	0	0	0	10	10	62	688
Subtotal Task 06	3	0	3	67	-6	61	195	134	324	1,904

TABLE A.1 Cost Summary (Dollars in Thousands) (a)

April 1991				FY 1991 to Date (October 1990 - September 1991)						
	Labor \$	Non-Labor \$ (a)	Total \$	Labor \$	Non-Labor \$ (b)	Total \$	Cum Budget	Cum Variance	TSP Approved FY Budget	Budgeted FY Labor Hours
Task 07 - Environmental Pathways & Dose Estimates										
0701 Task Management	2	1	3	18	0	18	18	0	26	306
0702 Code Restructure	7	1	8	45	10	55	66	11	158	1,321
HTDS Doses (d)	0	0	0	0	0	0	0	0	0	0
0703 Model Parameters	3	0	3	5	1	6	5	-1	25	337
Subtotal Task 07	12	2	14	68	11	79	89	10	209	1,964
Task 08 - Statistics										
0801 Task Management	3	1	4	27	-1	26	15	-11	25	213
0802 Task Assistance	4	0	4	12	0	12	20	8	32	303
Subtotal Task 08	7	1	8	39	-1	38	35	-3	57	516
Task 09 - Records Management	3	0	3	18	1	19	44	25	75	1,971
Task 10 - Quality Assurance	2	0	2	20	1	21	38	17	59	941
Task 11 - Information Resources										
1101 Task Management	2	0	2	10	0	10	9	-1	16	208
1102 Declassification	5	0	5	29	-1	28	43	15	87	1,584
1103 Resource Identification/Avail	5	0	5	33	0	33	36	3	61	1,462
Subtotal Task 11	12	0	12	72	-1	71	88	17	164	3,254

TABLE A.1 Cost Summary (Dollars in Thousands) (a)

	April 1991			FY 1991 to Date (October 1990 - September 1991)							
	Labor \$	Non-Labor \$ (b)	Total \$	Labor \$	Non-Labor \$ (a)	Total \$	Cum Budget	Cum Variance	TSP Approved FY Budget	Budgeted FY Labor Hours	
Task 12 - TSP Communications Support											
1201 Task Management	3	1	4	13	3	16	24	8	39	591	
1202 Video	1	0	1	2	1	3	29	26	29	230	
1203 Com Assessment Research	1	0	1	6	0	6	42	36	44	190	
1204 TSP Com Subcom Support	0	0	0	4	1	5	11	6	19	324	
1205 TSP Database/AV Support	0	2	2	0	7	7	11	4	17	10	
Subtotal - Task 12	5	3	8	25	12	37	117	80	148	1,345	
Subtotal, HEDR Project Tasks	178	28	206	1,184	167	1,351	1,748	397	3,051	32,699	
Contingency (e)							5		33	0	
Subtotal, Project Tasks Plus Contingency	178	28	206	1,184	167	1,351	1,753	397	3,084	32,699	
Technical Steering Panel (f)	0	57	57	0	254	254	465	211	800	0	
TOTAL	178	85	263	1,184	421	1,605	2,218	608	3,884	32,699	

(a) This table reflects changes approved at the April TSP meeting.

(b) Non-labor dollars include expenses such as travel, publication production, procurements, and subcontracts.

(c) Project management includes activities such as project control and administration, project communications, subcontract administration, records control, and peer review.

(d) Funding reallocated by the TSP at the April TSP meeting.

(e) Budget not yet allocated.

(f) TSP costs are administered through subcontracts which are reflected as non-labor costs. Actual TSP expenses include both labor and non-labor.

1. ID (Contract) Number: DE-ACO6-76RLO 1830		2. Program/Project Title: HANFORD ENVIRONMENTAL DOSE RECONSTRUCTION - TSP				3. Reporting Period: APRIL 1991																																																																																											
4a. Participant Name and Address Pacific Northwest Laboratory P.O. Box 999 Richland, WA 99352		4b. Client Name and Address DOE-RL Richland, Washington 99352				5. Start Date OCTOBER 1990																																																																																											
						6. Completion Date SEPTEMBER 1991																																																																																											
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11. Name/Signature of Participants Prog/Proj Manager & Date D. B. SHIPLER																																																																																																	

FIGURE A.2. Technical Steering Panel Budget Status

Appendix B

**Hanford Site-Originated Documents of
Potential Interest/Use to the HEDR Project -
Placed in the DOE-RL Public Reading Room
During April 1991**

Appendix B

Hanford Site-Originated Documents of Potential Interest/Use to the HEDR Project - Placed in the DOE-RL Public Reading Room During April 1991

* HW-7-189-DEL	Hanford Engineer Works Monthly Report May 1944. 47 p.	06/09/44
* HW-7-273-DEL	Hanford Engineer Works Monthly Report June 1944. 52 p.	07/07/44
* HW-7-612-DEL	Hanford Engineer Works Monthly Report August 1944. 80 p.	09/09/44
* HW-7-750-DEL	Hanford Engineer Works Monthly Report September 1944. 80 p.	10/10/44
• HW-7-3566-DEL	Hanford Engineer Works Monthly Report February 1946. 94 p.	03/08/46
• HW-7-5630-DEL	Hanford Engineer Works Monthly Report December 1946. 165 p.	01/17/47
• HW-7-5802-DEL	Hanford Engineer Works Monthly Report January 1947. 162 p.	02/20/47
* HW-10642	Aquatic Biology Lab Report for June 1948. 2 p.	07/01/48
* HW-21199	Bibliography on Slug Failures Occurring in the Hanford Production Reactors. 64 p.	05/24/51
* HW-21740	200 Areas Waste Storage Analysis. 10 p.	07/25/51
HW-24664	Separations Section Radiation Monitoring Monthly Report May 1952. 8 p.	06/03/52
HW-25531	Separations Sec. Radiation Monitoring Mnthly Rpt August 1952. 8 p.	09/04/52
HW-25817	Separations Sec. Radiation Monitoring Mnthly Rpt September 1952. 8 p.	10/02/52
HW-26740	Separations Section Radiation Monitoring Monthly Report December 1952. 7 p.	01/05/53

**Hanford Site-Originated Documents of
Potential Interest/Use to the HEDR Project -
Placed in the DOE-RL Public Reading Room
During April 1991**

HW-27604	Separations Sec. Radiation Monitoring Mnthly Rpt March 1953. 8 p.	04/02/53
HW-27938	Separations Sec. Radiation Monitoring Mnthly Rpt April 1953. 8 p.	05/04/53
HW-28249	Separations Sec. Radiation Monitoring Mnthly Rpt May 1953. 8 p.	06/01/53
HW-28592	Separations Sec. Radiation Monitoring Mnthly Rpt June 1953. 9 p.	07/01/53
HW-28931	Separations Sec. Radiation Monitoring Mnthly Rpt July 1953. 8 p.	08/04/53
HW-29858	Separations Sec. Radiation Monitoring Mnthly Rpt October 1953. 10 p.	11/04/53
HW-30161	Separations Sec. Radiation Monitoring Mnthly Rpt November 1953. 8 p.	12/07/53
HW-30746	Separations Sec. Radiation Monitoring Mnthly Rpt January 1954. 9 p.	02/01/54
HW-31014	Separations Sec. Radiation Monitoring Mnthly Rpt February 1954. 9 p.	03/01/54
HW-31353	Separations Sec. Radiation Monitoring Mnthly Rpt March 1954. 9 p.	04/01/54
HW-31742	Separations Sec. Radiation Monitoring Mnthly Rpt April 1954. 9 p.	05/01/54
HW-32044	Separations Sec. Radiation Monitoring Mnthly Rpt May 1954. 10 p.	06/01/54
HW-32299	Separations Sec. Radiation Monitoring Mnthly Rpt June 1954. 11 p.	07/01/54
HW-32601	Separations Sec. Radiation Monitoring Mnthly Rpt July 1954. 11 p.	08/02/54
HW-32916	Separations Section Radiation Monitoring Monthly Report August 1954. 10 p.	09/01/54
HW-33246	Separations Sec. Radiation Monitoring Mnthly Rpt September 1954. 11 p.	10/01/54

**Hanford Site-Originated Documents of
Potential Interest/Use to the HEDR Project -
Placed in the DOE-RL Public Reading Room
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• HW-33268	Recalculation of Krypton Releases. 4 p.	10/01/54
HW-33604	Separations Sec. Radiation Monitoring Mnthly Rpt October 1954. 12 p.	11/01/54
HW-34295	Separations Sec. Radiation Monitoring Mnthly Rpt December 1954. 11 p.	01/04/55
HW-34864	Separations Sec. Radiation Monitoring Mnthly Rpt January 1955. 11 p.	02/02/55
HW-35653	Separations Sec. Radiation Monitoring Mnthly Rpt February 1955. 11 p.	03/08/55
HW-36043	Separations Sec. Radiation Monitoring Mnthly Rpt March 1955. 12 p.	04/01/55
HW-36516	Separations Sec. Radiation Monitoring Mnthly Rpt April 1955. 9 p.	05/02/55
HW-37222	Separations Sec. Radiation Monitoring Mnthly Rpt May 1955. 10 p.	06/06/55
HW-38471	Separations Sec. Radiation Monitoring Mnthly Rpt July 1955. 9 p.	08/12/55
HW-38901	Separations Sec. Radiation Monitoring Mnthly Rpt August 1955. 9 p.	09/12/55
HW-39321	Separations Sec. Radiation Monitoring Mnthly Rpt September 1955. 9 p.	10/12/55
HW-39802	Separations Sec. Radiation Monitoring Mnthly Rpt October 1955. 9 p.	11/10/55
HW-40248	Separations Sec. Radiation Monitoring Mnthly Rpt November 1955. 9 p.	12/12/55
* HW-41702-E	Radiological Sciences Dept Rpt for Month of February 1956. 9 p.	03/05/56
* HW-41703	Radiological Sciences Dept Monthly Section Reports February 1956. 27 p.	03/05/56
• HW-43071	Hanford Release Calculations for April 1956. 1 p.	05/15/56

**Hanford Site-Originated Documents of
Potential Interest/Use to the HEDR Project -
Placed in the DOE-RL Public Reading Room
During April 1991**

• HW-43899	Hanford Release Calculations for May 1956. 1 p.	06/22/56
• HW-44352	Hanford Release Calculations for June 1956. 1 p.	07/17/56
• HW-45512	Hanford Release Calculations for July 1956. 1 p.	09/11/56
• HW-46395	Hanford Release Calculations for August & September 1956; and Corrections of Pu Figures for June & July 1956. 1 p.	10/31/56
• HW-47122	Hanford Release Calculations for October 1956; and Corrections for June through September. 2 p.	12/06/56
• HW-47253	Hanford Release Calculations for November 1956. 1 p.	12/14/56
• HW-47880	Hanford Release Calculations for December 1956. 1 p.	01/18/57
• HW-48525	Hanford Release Calculations for January 1957. 1 p.	02/14/57
• HW-49782	Hanford Release Calculations for February & March 1957. 1 p.	04/23/57
• HW-50686	Hanford Release Calculations for April 1957. 1 p.	06/10/57
• HW-50726	Comments on the Two Methods Used to Report Krypton Releases at the HAPO. 2 p.	06/12/57
• HW-51179-DEL	Changes in Reporting HAPO Releases. 1 p.	06/28/57
• HW-51413	Hanford Release Calculations for July 1956 through June 1957. 2 p.	07/17/57
• HW-52264	Hanford Release Calculations for July 1957. 1 p.	08/26/57

**Hanford Site-Originated Documents of
Potential Interest/Use to the HEDR Project -
Placed in the DOE-RL Public Reading Room
During April 1991**

• HW-54359	Hanford Release Calculations for August 1957 through November 1957. 1 p.	01/03/58
• HW-54730	Hanford Release Calculations for December 1957. 1 p.	01/27/58
• HW-55098	Hanford Release Calculations for January 1958. 1 p.	02/25/58
• HW-55505	Hanford Release Calculations for February 1958. 1 p.	03/26/58
• HW-55712	Hanford Release Calculations for March 1958. 1 p.	04/14/48
• HW-56231	Hanford Release Calculations for April 1958. 1 p.	06/03/58
• HW-56916	Hanford Release Calculations for July 1957 through June 1958. 2 p.	07/25/58
• HW-57183	Hanford Release Calculations for July 1958. 1 p.	08/15/58
• HW-57436	Corrections of HAPO Releases for Fiscal Year 1958. 2 p.	09/12/58
• HW-57936	Hanford Release Calculations for August & September 1958. 1 p.	10/28/58
• HW-58471	Hanford Release Calculations for October 1958. 1 p.	12/09/58
• HW-58741	Hanford Release Calculations for November 1958. 1 p.	12/31/58
• HW-59367	Hanford Release Calculations for December 1958 & January 1959. 1 p.	02/24/59
• HW-59933	Hanford Release Calculations for February 1959. 1 p.	04/09/59
• HW-60270	Hanford Release Calculations for March 1959. 1 p.	05/05/59
• HW-61479	Precision & Accuracy of Releases. 2 p.	08/10/59

**Hanford Site-Originated Documents of
Potential Interest/Use to the HEDR Project -
Placed in the DOE-RL Public Reading Room
During April 1991**

• HW-63809	Hanford Release Calculations for July 1959 through December 1959. 1 p.	02/05/60
• HW-64492	Hanford Release Calculations for January 1960. 1 p.	03/28/60
• HW-64887	Hanford Release Calculations for March 1960. 1 p.	04/22/60
• HW-65914	Hanford Release Calculations for April & May 1960. 1 p.	06/29/60
* HW-67283	Monitoring Noble Gases to Determine Radiological Significance of Fission Products in Reactor Effluent. 13 p.	02/06/61
• HW-68413	Hanford Release Calculations for July through December 1960. 1 p.	02/06/61
• IN-6263	Design & Procurement History of Hanford Engineer Works & Clinton Semi-Works (in 2 volumes). 486 p.	12/31/45

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- Declassified by Secretary of Energy Watkins' directive.
 - * Declassified 1990-1991 by earlier guidance.

ADDENDUM

These documents on krypton-85 releases at Hanford were declassified in 1991 under the guidelines of Secretary of Energy Watkins' directive. They are not yet in the DOE-RL Public Reading Room. However, the data from these reports have been incorporated into HAN-62263, which is at the DOE-RL Public Reading Room in Richland, Washington.

These calculations were a part of the Atomic Energy Commission Department of Research and Development effort to estimate the amounts of radioactive noble gases released by Hanford operations. Noble gases such as krypton and xenon do not react with other materials; therefore, they remain in the atmosphere until they decay. Also, if the release rate exceeds the decay rate, there will be a net increase in the atmospheric content of the gas. In terms of quantity and longevity, krypton-85 (10-year half-life) is, by far, the most significant radioactive noble gas released during reprocessing operations.

HAN-57166	Hanford Release Calculations	11/23/54
HAN-57305	"	12/07/54
HAN-58010	"	02/11/55
HAN-58257	"	03/08/55
HAN-58689	"	04/04/55
HAN-59086	"	05/16/55
HAN-59474	"	06/23/55
HAN-60376	"	09/29/55
HAN-60625	"	10/21/55
HAN-61529	"	02/10/56
HAN-61652	"	02/27/56
HAN-62429	"	05/15/56

Appendix C
HEDR Publications - To Date

Appendix C

HEDR Publications - To Date

Title	Author	Date Issued	Publication No.	Additional Information	Status
Hanford Environmental Dose Reconstruction Project Monthly Report	HEDR Project Office	Ongoing	PNL-6450 HEDR	Monthly report; cleared one time for documentation	Periodic report; TSP approval not necessary
Document Search and Declassification for Phase I of the HEDR Project	HEDR staff	5/91		Letter report to J. Till; available from TSP	TSP approval not necessary; for information only
FY 1991 Task Plans for the Hanford Environmental Dose Reconstruction Project	HEDR staff	4/91	PNL-7563 HEDR REV. 1	Supersedes PNL-7563 HEDR; TSP approved 4/91	Published final 4/91
Project Summary Schedule	Shipler, DB	4/91	PNL-7685 HEDR	Available from TSP	PNL addressing TSP comments
Effects of the Loss of Correlation Structure on Phase I Dose Estimates	Simpson, JC	2/91	PNL-SA-191085 HEDR	Milestone 0202C	PNL addressing TSP comments
Assessment of FY 1991 Scope Limitations on Out-Year Activities	Shipler, DB	12/90	PNL-7588 HEDR		To TSP 12/90
FY 1991 Project Plan for the HEDR Project, Phase II	HEDR Staff	11/90	PNL-7563 HEDR	Superseded by PNL-7563 HEDR Rev. 1	
HEDR Project Plan - Pre-Decisional Draft	Shipler, DB	10/90	PNL-7515 HEDR	Superseded by PNL-7563 HEDR Rev. 1	
Draft Summary Report	HEDR Staff	7/90	PNL-7410 HEDR	Available from TSP	PNL addressing TSP comments
Draft Air Pathway Report	HEDR Staff	7/90	PNL-7412 HEDR	Available from TSP	PNL addressing TSP comments

Title	Author	Date Issued	Publication No.	Additional Information	Status
Draft Water Pathway Report	HEDR Staff	7/90	PNL-7411 HEDR	Available from TSP	PNL addressing TSP comments
Initial Communication Survey Results for the HEDR Project	Beck, DM	3/91	PNL-7423 HEDR	WSU omnibus survey of WA State residents; HEDR questions	Published final 3/91
QA Audit Report of the HEDR Project-Data Traceability, A-90-15	Pratt, RC	7/90	PNL-7428 HEDR		No TSP comments
A Preliminary Examination of Audience-Related Communications Issues: Hanford Environmental Dose Reconstruction Project	Holmes, CW	4/90	PNL-7231 HEDR	TSP approved 4/91	Published final 4/91
MESOILT2, A Lagrangian Trajectory Climatological Dispersion Model	Ramsdell, JV	3/91	PNL-7340 HEDR	TSP approved 3/91	Published final 3/91
Population Estimates for Phase I	Beck, DM	2/90	PNL-7263 HEDR		PNL addressing TSP comments
Estimates of Food Consumption	Callaway	2/90	PNL-7260 HEDR		PNL addressing TSP comments
Soil Ingestion by Dairy Cattle	Darwin, RF	2/90	PNL-SA-17918 HEDR		For possible use later in project; TSP approval not required
Computational Model Design Specification for Phase I of the Hanford Environmental Dose Reconstruction Project	Napier, BA	2/90	PNL-7274 HEDR		PNL addressing TSP comments
Estimates of Columbia River Radionuclide Concentrations: Data for Phase I Dose Calculations	Richmond, MC; Walters, WH	1/90	PNL-7248 HEDR	TSP approved 4/91	Being finalized at PNL
Evaluation of Thyroid Radioactivity Measurement Data From Hanford Workers, 1944-1946	Ikenberry, R	1/90	PNL-7254 HEDR	TSP approved 4/91	Published final 4/91

Title	Author	Date Issued	Publication No.	Additional Information	Status
I-131 in Irradiated Fuel at Time of Processing from December 1944 Through December 1947	Heeb, CM and Morgan, LG	3/91	PNL-7253 HEDR	TSP approved 3/91	Published final 3/91
Work Plan for the Hanford Environmental Dose Reconstruction Project	Haerer, HA	12/89	PNL-6696 HEDR REV 1		TSP approved; published 12/89
Uncertainties in Source Term Calculations Generated by the ORIGEN2 Computer Code for Hanford Production Reactors	Heeb, CM	3/91	PNL-7223 HEDR	TSP approved 3/91	Published final 3/91
Selection of Dominant Radionuclides for Phase I of the HEDR Project	Napier, BA	12/89	PNL-7231 HEDR		PNL addressing TSP comments
Atmospheric Transport and Dispersion Modeling for the Hanford Environmental Dose Reconstruction Project	Ramsdell, JV	12/89	PNL-7198 HEDR		PNL addressing TSP comments
Atmospheric Transport Modeling and Input Data for Phase I of the Hanford Environmental Dose Reconstruction Project	Ramsdell, JV; Burk, KW	12/89	PNL-7199 HEDR		PNL addressing TSP comments
Fission-Product Iodine During Early Hanford-Site Operations: Its Production and Behavior During Fuel Processing, Off-Gas Treatment, and Release to the Atmosphere	Burger, LL	12/89	PNL-7210 HEDR	TSP approved 4/91	PNL finalizing
The Hanford Environmental Dose Reconstruction Project: Background Information	Byram, SJ	12/89	PNL-SA-17658 HEDR	For use with focus groups	TSP approval not required
Summary of Literature Review of Risk Communication	Byram, SJ	12/89	PNL-7226 HEDR	TSP approved 4/91	PNL finalizing
Milk Cow Feed Intake and Milk Production and Distribution Estimates for Phase I	Beck, DM	12/89	PNL-7227 HEDR		PNL addressing TSP comments
Preliminary Summaries for Vegetation, River and Drinking Water and Fish Radionuclide Concentration Data (DRAFT)	Woodruff, RK	11/89	PNL-SA-17641 HEDR		PNL addressing TSP comments

Title	Author	Date Issued	Publication No.	Additional Information	Status
Radionuclide Sources and Radioactive Decay Figures Pertinent to the HEDR Project	Heeb, CM	3/91	PNL-7177 HEDR	TSP approved 4/91	Published final 4/91
Estimations of Traditional Native American Diets in the Columbia Plateau	Hunn, ES; Bruneau, CL	8/89	PNL-SA-17296		Reviewed by tribes
Summary of Workshop on Milk Production and Distribution, November 30, 1988-HEDR Project	Beck, DM, et al.	7/89	PNL-6975 HEDR		To TSP 8/89
A History of Major Hanford Facilities and Processes Involving Radioactive Material	Ballinger, MY; Hall, RA	3/91	PNL-6964 HEDR	TSP approved 4/91	Published final 4/91
Feasibility of Using ¹²⁹ I Concentrations in Human Tissue to Estimate Radiation Dose from ¹³¹ I	McCormack, WD	4/89	PNL-6889 HEDR	TSP approved 9/89	Published final 1989
Summary Report of HEDR Workshop on Sensitivity and Uncertainty Analysis	Sagar, B; Liebetrau, AM	3/89	PNL-SA-16804 HEDR	Summary of workshop held January 16-18, 1989	Sent to Till 3/89-no written response provided to PNL
Response to TSP Directive 88-4, Ground-Water Contamination Data	Freshley, MD	3/89	PNL-6847 HEDR		TSP received 3/89; no written response provided to PNL
Demographic, Agricultural, Food Consumption, and Lifestyle Research for the Hanford Environmental Dose Reconstruction Project	Beck, DM, et al.	2/89	PNL-6834 HEDR	Incorporates earlier TSP comments	TSP received 3/89; no written response provided to PNL
Proposed Approach for Developing Information on Population Food Consumption and Lifestyles of Native Americans in the HEDR Study Area	Rhoads, RE; Bruneau, CL	1/89	PNL-6803 HEDR	Working document	TSP comments were incorporated into PNL-6834 HEDR

Appendix D

HEDR Presentation Handouts to the TSP - To Date

Appendix D

HEDR Presentation Handouts to the TSP - To Date

D.1

Title	Author	Date Issued	Publication No.	Additional Information
Status of Technical Work - Hanford Environmental Dose Reconstruction Project	Napier, BA et al.	4/91	PNL-SA-19356 HEDR	Presented at the TSP mtg, April 5, 1991, Lewiston, ID
Process for Estimating Doses to the Coeur d'Alene Tribe	Ikenberry, TA	3/91	PNL-SA-19204 S HEDR	Presented to the Coeur d'Alene Tribal Council, February 28, 1991, Plummer, ID
Information for the HEDR Planning Workshop - 2/14-16/91	Shipler, DB	2/91	PNL-SA-19108 S HEDR	Presented at the TSP Workshop, February 14-16, 1991, Seattle, WA
Phase I Dose Estimates for the Kalispel Tribe	Ikenberry, TA	1/91	PNL-SA-19098 A HEDR	Presented to the Kalispel Tribal Council, February 5, 1991, Usk, WA
Long-Range Project Plan	Shipler, DB	1/91	PNL-SA-18949 S HEDR	Presented at the TSP mtg, Jan 11, 1991, Pasco, WA
Preliminary Response to the FY 1991 Project Plan	Shipler, DB	1/91	PNL-SA-18981 HEDR	Presented at the TSP mtg, Jan 11, 1991, Pasco, WA
Application of a Geographical Information System to the HEDR Project	Stephan, JG	1/91	PNL-SA-18958 S HEDR	Presented at the TSP mtg, Jan 11, 1991, Pasco, WA
Dose Model and Parameter Restructuring	Ikenberry, TA	1/91	PNL-SA-18957 S HEDR	Presented at the TSP mtg, Jan 11, 1991, Pasco, WA
Status of TSP Directive 89-9	Cuello, R.	1/91	PNL-SA-18962 S HEDR	Presented at the TSP mtg, Jan 11, 1991, Pasco, WA
Atmospheric Model Restructuring	Ramsdell, JV	1/91	PNL-SA-18956 S HEDR	Presented at the TSP mtg, Jan 11, 1991, Pasco, WA
Uncertainty Analysis	Simpson, JC	1/91	PNL-SA-18948 S HEDR	Presented at the TSP mtg, Jan 11, 1991, Pasco, WA

Title	Author	Date Issued	Publication No.	Additional Information
Project Model Analysis and Restructuring	Napier, BA	1/91	PNL-SA-18955 S HEDR	Presented at the TSP mtg, Jan 11, 1991, Pasco, WA
Hanford Environmental Dose Reconstruction Project - Phase I Report	Haerer, HA	5/90	PNL-18304 S HEDR	Presented at the workshop, "Public Health Aspects of Hanford Health Studies, A Workshop for State, Local, and Tribal Health Officials," June 6, 1990
Detailed Example Calculations for HEDR, Phase I	Napier, BA	2/90	PNL-SA-17913 HEDR	Presented at the TSP mtg, Feb 15-17, 1990, Richland, WA
Communications Directive	Rhoads, RE	2/90	PNL-SA-17903 S HEDR	Presented at the TSP mtg, Feb 15-17, 1990, Richland, WA
HEDR Project Report to the TSP	Haerer, HA	2/90	PNL-SA-27904 S HEDR	Presented at the TSP mtg, Feb 15-17, 1990, Richland, WA
Hanford Environmental Dose Reconstruction Project	Haerer, HA	12/89	PNL-SA-17661S HEDR	Presented at the TSP mtg, December 11-13, 1989, Richland, WA
Communications Directive	Rhoads, RE	12/89	PNL-SA-17653 S HEDR	Presented at the TSP mtg, December 11-13, 1989, Richland, WA
Preliminary Evaluation of Thyroid Bioassay Data from Hanford Workers, 1944-1946	Ikenberry, T; Napier, BA	12/89	PNL-SA-17670 S HEDR	Presented at the TSP mtg, December 11-13, 1989, Richland, WA
Overview of Project Model - Air Pathway	Napier, BA	12/89	PNL-SA-17673 HEDR	Presented at the TSP mtg, December 11-13, 1989, Richland, WA
Source Terms - Air Pathway Source Terms - Surface-Water Pathway	Morgan, LG	12/89	PNL-SA-17657 HEDR	Presented at the TSP mtg, December 11-13, 1989, Richland, WA
Atmospheric Transport Model	Freshley, MD	12/89	PNL-SA-17662 S HEDR	Presented at the TSP mtg, December 11-13, 1989, Richland, WA
Environmental Monitoring Data: Vegetation, 1945-1947	Woodruff, RK	12/89	PNL-SA-17671 HEDR	Presented at the TSP mtg, December 11-13, 1989, Richland, WA

Title	Author	Date Issued	Publication No.	Additional Information
Preliminary Calculated and Measured Concentrations of Iodine-131 in Vegetation for Phase I	Napier, BA	12/89	PNL-SA-17674 HEDR	Presented at the TSP mtg, December 11-13, 1989, Richland, WA
Milk Production and Distribution	Beck, DM	12/89	PNL-SA-17649 S HEDR	Presented at the TSP mtg, December 11-13, 1989, Richland, WA
Overview of Project Model - Surface-Water Pathway	Napier, BA	12/89	PNL-SA-17672 HEDR	Presented at the TSP mtg, December 11-13, 1989, Richland, WA
Surface-Water Pathway	Freshley, MD	12/89	PNL-SA-17660 S HEDR	Presented at the TSP mtg, December 11-13, 1989, Richland, WA
Environmental Measurements - Columbia River	Poston, TM; Dirkes, R.	12/89	PNL-17669 HEDR	Presented at the TSP mtg, December 11-13, 1989, Richland, WA
Phase II Planning	Haerer, HA	12/89	PNL-17661 S HEDR	Presented at the TSP mtg, December 11-13, 1989, Richland, WA
Discussion with TSP Subcommittee on Communication Strategy	Rhoads, RE	10/89	PNL-SA-17475 HEDR	Presented at the TSP Subcommittee meeting on Communication Strategy, October 5, 1989, Portland, OR
Surface Water Exposure Pathways	Napier, BA; Poston, TM	10/89	PNL-SA-17502 S HEDR	Presented at the TSP meeting, October 12-14, 1989, Portland, OR
HEDR Project Report to the TSP	Haerer, HA	10/89	PNL-SA-17501 HEDR	Presented at the TSP mtg, Oct 12-14, 1989, Portland, OR
Methods for Presenting Results to the Public	Rhoads, RE	8/89	PNL-SA-17368 HEDR	Presented at the TSP mtg, September 6, 1989, Portland, OR
HEDR Project Report to the TSP July 21, 1989	Haerer, HA	7/89	PNL-SA-17218 HEDR	Presented at the TSP mtg, July 21, 1989, Richland, WA

Title	Author	Date Issued	Publication No.	Additional Information
Radionuclides Transported by the Columbia River	Freshley, MD	7/89	PNL-SA-17235 HEDR	Presented at the TSP mtg, July 21, 1989, Richland, WA
Defining Demographic Categories for Phase I	Napier, BA; Beck, DM	5/89	PNL-SA-17035 HEDR	Presentation handout for the TSP mtg, May 18-20, 1989, Toppenish, WA
HEDR Project Report to the TSP for May 1989 Public Meeting	Haerer, HA	5/89	PNL-SA-17032 HEDR	Presented at the TSP mtg, May 18-20, 1989, Toppenish, WA
Task 6 - Population, Food Consumption and Lifestyles	Rhoads, RE	3/89	PNL-SA-16785 HEDR	Presented at the Native American Workshop, March 14-15, 1989, Richland, WA
HEDR Native American Population, Food Consumption and Lifestyle Study - Data Requirements	Bruneau, CL	3/89	PNL-SA-16784 HEDR	Presented at the Native American Workshop, March 14-15, 1989, Richland, WA
Hanford Environmental Dose Reconstruction Project - Report to the Technical Steering Panel	Haerer, HA	3/89	PNL-SA-16794 HEDR	Presented at the TSP mtg, March 17, 1989, Spokane, WA
Availability of I-131 Vegetation Data	Price, KR	1/89	PNL-SA-16573 HEDR	Presented at HEDR workshop on Sensitivity and Uncertainty Analysis, January 16-18, 1989, Pasco, WA
Atmospheric Pathway	Ramsdell, JV	1/89	PNL-SA-16565 HEDR	Presented at the HEDR workshop on Sensitivity and Uncertainty Analysis, January 16-18, 1989, Pasco, WA
HEDR Demography, Agriculture, and Lifestyle Research	Beck, DM	1/89	PNL-SA-16568 HEDR	Presented at the HEDR workshop on Sensitivity and Uncertainty Analysis, January 16-18, 1989, Pasco, WA
Aspects of Sensitivity/Uncertainty Analysis in the HEDR Project	Sagar, B.	1/89	PNL-SA-16571 HEDR	Presented at the HEDR Workshop on Sensitivity and Uncertainty Analysis, January 16-18, 1989, Pasco, WA
HEDR Demography, Agriculture, and Lifestyle Research	Beck, DM	1/89	PNL-SA-16568 HEDR	Presented at the HEDR Workshop on Sensitivity and Uncertainty Analysis, January 16-18, 1989, Pasco, WA

Title	Author	Date Issued	Publication No.	Additional Information
Surface Water Transport Uncertainty	Walters, W.	1/89	PNL-SA-16572 HEDR	Presented at the HEDR Workshop on Sensitivity and Analysis, January 16-18, 1989, Pasco, WA
Source Terms	Morgan, LG	1/89	PNL-SA-16566 HEDR	Presented at the HEDR Workshop on Sensitivity and Uncertainty Analysis, January 16-18, 1989, Pasco, WA
Experience with Gress and Swats	Piepho, MG	1/89	PNL-SA-16567 HEDR	Presented at the HEDR Workshop on Sensitivity and Uncertainty Analysis, January 16-18, 1989, Pasco, WA
Purpose of Workshop	Gilbert, D.	1/89	PNL-SA-16569 HEDR	Presented at the HEDR Workshop on Sensitivity and Uncertainty Analysis, January 16-18, 1989, Pasco, WA
Example of Sensitivity/Uncertainty Analysis	Streng, DL	1/89	PNL-SA-16570 HEDR	Presented at the HEDR Workshop on Sensitivity and Uncertainty Analysis, January 16-18, 1989, Pasco, WA
Estimated Quantity of ¹³¹ I Contained in Irradiated Fuel at Time of Fuel Processing, CY 1944-1945	Jackson, PO; Morgan, LG	11/88	PNL-SA-16398 HEDR	Presented at the TSP mtg, November 11-12, 1988, Olympia, WA

Appendix E
HEDR-Related Publications

Note: This appendix lists publications that present aspects of dose reconstruction in the open scientific literature; TSP approval is not required.

Appendix E

HEDR-Related Publications

E-1

Title	Author	Date Issued	Publication No.	Audience	Status
Application of a Geographic Information System to the HEDR Project	Shipler, DB et al.	5/91	PNL-SA-19487A HEDR	Society of Environmental Toxicology and Chemistry	Submitted abstract
Communicating Risk to Non-Scientific Audiences: Misconceptions and Guidelines	Lundgren, RE and McMakin, AH	5/91	PNL-SA-19488 A HEDR	Society of Environmental Toxicology and Chemistry	Submitted abstract
The Estimation of Early Hanford Releases of Iodine-131	Heeb, CM et al.	3/91	PNL-SA-19321 A HEDR	American Nuclear Society 1991 Annual Meeting	To be presented 6/91
Reconstruction of Radionuclide Movement in Ground Water at the Hanford Site	Freshley, MD and Thorne, PD	3/91	PNL-SA-19269 S HEDR	American Nuclear Society 1991 Annual Meeting	To be presented 6/91
Initial Findings of the Hanford Environmental Dose Reconstruction Project	Ikenberry, TA and Napier, BA	3/91	PNL-SA-19251 S HEDR	American Nuclear Society 1991 Annual Meeting	To be presented 6/91
Integration of Models for the Hanford Environmental Dose Reconstruction Project	Napier, BA	3/91	PNL-SA-19252 S HEDR	American Nuclear Society 1991 Annual Meeting	To be presented 6/91
Developing Milk Industry Estimates for Dose Reconstruction Projects	Beck, DM	2/91	PNL-SA-19172 S HEDR	American Nuclear Society 1991 Annual Meeting	To be presented 6/91
Native American Food Consumption Data Collection	Bruneau, CL	2/91	PNL-SA-19174 S HEDR	American Nuclear Society 1991 Annual Meeting	To be presented 6/91
Developing Population Estimates for Dose Reconstruction Projects	Beck, DM	2/91	PNL-SA-19173 S HEDR	American Nuclear Society 1991 Annual Meeting	To be presented 6/91
Effects of the Loss of Correlation Structure on Dose Estimates	Simpson, JC	2/91	PNL-SA-19115 S HEDR	American Nuclear Society 1991 Annual Meeting	To be presented 6/91
Recovery and Evaluation of Historic Environmental Monitoring Data at Hanford	Dirkes, RL	2/91	PNL-SA-19119 S HEDR	American Nuclear Society 1991 Annual Meeting	To be presented 6/91

Title	Author	Date Issued	Publication No.	Audience	Status
Sensitivity of the MESOILT2 Dispersion Model to Input Uncertainty	Ramsdell, JV	2/91	PNL-SA-19117 S HEDR	American Nuclear Society 1991 Annual Meeting	To be presented 6/91
Developments in Atmospheric Modeling for Dose Reconstruction at Hanford	Ramsdell, JV	2/91	PNL-SA-19116 S HEDR	American Nuclear Society 1991 Annual Meeting	To be presented 6/91
Hanford Environmental Dose Reconstruction: A Public Communications Effort Toward Credibility, Understanding and Independence	Harvey, GL	2/91	PNL-SA-19118 S HEDR	American Nuclear Society 1991 Annual Meeting	To be presented 6/91
Providing Information Resources for the Hanford Environmental Dose Reconstruction Project	Gydesen, SP	1/91	PNL-SA-19079 A HEDR	American Nuclear Society 1991 Annual Meeting	To be presented 6/91
Overview of Hanford Environmental Dose Reconstruction Project	Shipler, DB	1/91	PNL-SA-19078 A HEDR	American Nuclear Society 1991 Annual Meeting	To be presented 6/91
A Multi-Method Approach to Audience Analyses in Developing Comprehensive Public Communications Programs	Homes, CW; Byram, SJ; VonWinterfeldt, D.	10/90	PNL-SA-18676 HEDR	Society for Risk Analysis 1990 Annual Meeting, October 7-10, 1990, New Orleans, LA	Presented 10/90
GENII - Hanford Environmental Dosimetry Package	Napier, BA et al.	7/90	PNL-SA-18478	American Nuclear Society 1990 Winter Meeting	Presented 11/90
Atmospheric Modeling for Dose Reconstruction at Hanford	Ramsdell, V; Burk, K.	7/90	PNL-SA-18487A	American Nuclear Society 1990 Winter Meeting	Presented 11/90
Statistical Aspects of the Hanford Environmental Dose Reconstruction Project and the Hanford Thyroid Disease Study	Gilbert, RO et al.		PNL-SA-18396 HEDR	American Statistical Association Conference on Radiation and Health, July 8-12, 1990, Copper Mountain, CO	Presented 7/90
Statistical Aspects of Reconstructing the I-131 Dose to the Thyroid of Individuals Living Near the Hanford Site in the mid-1940s	Gilbert, RO et al.	3/90	PNL-SA-17384	Workshop: Statistics of Human Radiation Exposure to Ionizing Radiation, April 2-4, 1990, Oxford, UK	Presented 4/90

Title	Author	Date Issued	Publication No.	Audience	Status
Reconstruction of Hanford Vegetation Monitoring Data for Dose Reconstruction for 1945-1947	Woodruff, RK; Mart, E; Hanf, RW	1/90	PNL-SA-17760 A HEDR	1990 Health Physics Society Meeting, June 24-28, 1990, Anaheim, CA	Presented 6/90
Uncertainty Analysis of the Conversion Factor for Historic Iodine-131 Gross Beta Vegetation Measurements	Streng, DL et al.	12/89	PNL-SA-17713 HEDR	1990 Health Physics Soc. Mtg, June 24-28, 1990, Anaheim, CA	Presented 6/90
Sensitivity and Uncertainty Analyses for Environmental Dose Reconstruction	Sagar et al.	11/89	PNL-SA-17586 A HEDR	Workshop on Uncertainty Analyses in Accident Consequence Assessment, Nov 13-16, 1989, Santa FE, NM	Presented 11/89
The Identification of Terrain-Induced Circulations Using Principal Components	Skyllingstad, ED and Schwartz, MN	10/89	PNL-SA-17164 HEDR	American Meteorological Society Conference on Probability and Statistics, October 1-5, 1989 Monterey, CA	Presented 10/89
Mathematical and Statistical Aspects of Reconstructing Doses to Individuals Living Near the Hanford Site Since the 1940s	Liebetrau, AM et al.	10/89	PNL-SA-17498 HEDR	SIAM Conference on Applied Probability in Science and Engineering, March 5-7, 1990, New Orleans, LA	Presented 3/90
Temporal Variations in Atmospheric Dispersion at Hanford	Ramsdell, JV	9/89	PNL-SA-17375 HEDR	Hanford Symposium on Health and the Environment, Oct 16-19, 1989, Richland, WA	Presented 10/89
The Hanford Environmental Dose Reconstruction Project: Overview	Haerer, HA et al.	9/89	PNL-SA-16859 HEDR	Hanford Symposium on Health and the Environment, Oct 16-19, 1989, Richland, WA	Presented 10/89
The Hanford Environmental Dose Reconstruction Project: Technical Approach	Napier, BA et al.	9/89	PNL-SA-16874 HEDR	Hanford Symposium on Health and the Environment, October 16-19, 1989 Richland, WA	Presented 10/89
The Hanford Environmental Dose Reconstruction Project: The Role of Applied Sociology	Beck, DM	4/89	PNL-SA-16880 HEDR	Pacific Sociological Association Meeting, April 13-16, 1989, Reno, NV	Presented 4/89

Title	Author	Date Issued	Publication No.	Audience	Status
Potential Applications of Geographical Information Systems for Analyzing Hanford Environmental Dose Reconstruction Data	Stephan, JG et al.	3/89	PNL-SA-16767 HEDR	Regional Symposium of the HPS Computer Applications in Health Physics, March 16-17, 1989 Richland, WA	Presented 3/89
Estimating Atmospheric Dispersion for Reconstruction of Doses from Hanford Operations	Ramsdell, JV	4/88	PNL-SA-15818 HEDR	69th Annual Meeting of the Pacific Division of the American Association for the Advancement of Science, June 19- 23, 1988, Corvallis, OR	Presented 6/88

Appendix F

Communications Log - March 1991

Appendix F

Communications Log - March 1991

Initiated By/ Affiliation	Contact/ Affiliation	Type	Subject
C Heeb/PNL	M Robkin/TSP	Phone	Green run fact sheet
M Robkin/TSP	C Heeb/PNL	Phone	Potential proposal for HEDR source term work
HA Haerer/NUS	DB Shipler/PNL	Phone	Decision-making process; legal actions
DB Shipler/PNL	JE Till/TSP	Phone	Nguyen contract, declassification
DB Shipler/PNL	HA Haerer/NUS	Phone	Decision meeting, information clearing house
CJ Maletskos/Kirkland and Ellis	DB Shipler/PNL	Phone	Legal actions
DB Shipler/PNL	MW Tiernan/DOE-RL	Phone	Maletskos request
DB Shipler/PNL	CJ Maletskos	Phone	Request for review time
CJ Maletskos/Kirkland and Ellis	DB Shipler/PNL	Phone	Change in review date
Y Sherman/DOE-RL	DB Shipler/PNL	Phone	Request for information
DB Shipler/PNL	JE Till/TSP	Phone	TSP comments on project summary schedule
WA Bishop/TSP	SM Finch/PNL	Phone	Tribal invoicing procedures
SM Finch/PNL	J Thomas/HEAL	Phone	Report distribution
SM Finch/PNL	A Hargrove/Colville Tribe	Phone	Invoice question
D Trotter/Monenco Consultants Ltd.	SM Finch/PNL	Phone	Document request
B Shleien/TSP	SM Finch/PNL	Phone	May CDC mtg, meet D Shipler before July TSP mtg

Initiated By/ Affiliation	Contact/ Affiliation	Type	Subject
K CharLee/TSP staff	SM Finch/PNL	Phone & fax	Meeting dates, comments on project summary schedule
J Thomas/Heal	JM Daer/PNL	Phone	Add name to report distribution list
JM Daer/PNL	K CharLee/TSP staff	Phone	TSP member resumes
K CharLee/TSP staff	JM Daer/PNL	Phone	TSP staff resume, copies of Guideline & Op Procedures for TSP, Project Coordinator for Coeur d'Alene Tribe
WJ Roberds/Golder	JM Daer/PNL	Phone	Fax confirmation
JM Daer/PNL	JS Stohr/TSP staff	Phone	Exchange of dosimeter at Lewiston, Idaho, meeting
JM Daer/PNL	ML Blazek/TSP	Phone	Exchange of dosimeter at Lewiston, Idaho, meeting
AH Murphy/TSP	JV Ramsdell/PNL	Phone	Meeting at PNL to discuss atmospheric model
RO Gilbert/PNL	ML Blazek/TSP	Fax	Document search strategy
RO Gilbert/PNL	KJ Kopecky/TSP	Phone	Statistics Task activities
NJ Germond/TSP	SP Gydesen/PNL	Phone	Explained "need-to-know," answered questions from 3/20 visit, estimated destroyed Hanford Site-generated documents from 1944-1960
SP Gydesen/PNL	H Burgess/GE Nuclear	Phone	GE will not formally respond to 1/30 request pending resolution of class- action litigations
NJ Germond/TSP	GP Gydesen/PNL	Phone	Recently discovered historical records, declassification
NJ Germond/TSP	SP Gydesen/PNL	Phone	Wording about publicly available documents of potential use/interest to HEDR
SP Gydesen/PNL	NJ Germond/TSP	Phone	Comments on N Germond's text on HEDR-related documents

Initiated By/ Affiliation	Contact/ Affiliation	Type	Subject
ML Blazek/TSP	SP Gydesen/PNL	Phone	Information on a planned I-131 release in 1963, document request
ML Blazek/TSP	SP Gydesen/PNL	Phone	Review of Biology Annual Reports from 1949-1963
ML Blazek/TSP	GL Harvey/PNL	Phone & fax	Communications assessment survey
K Niles/TSP staff	GL Harvey/PNL	Phone	TSP video script ready
ML Blazek/TSP	GL Harvey/PNL	Phone	Communications assessment survey, video development
K Niles/TSP staff	GL Harvey/PNL	Phone	TSP poster
M Power/TSP staff	GL Harvey/PNL	Phone	TSP communications activities resulting from Lewiston mtg
K Niles/TSP staff	GL Harvey/PNL	Phone	TSP video production, communications assessment survey
K Niles/TSP staff	GL Harvey/PNL	Phone	TSP poster
ML Blazek/TSP	GL Harvey/PNL	Phone & fax	TSP video production
K Niles/TSP staff	GL Harvey/PNL	Phone & fax	TSP communications activities, TSP video
A Beers/TSP staff	GL Harvey/PNL	Phone	Communications assessment research
J Bates/public	GL Harvey/PNL	Phone	Interest in HEDR Project
B Shleien/TSP	BA Napier/PNL	Phone	European environmental models

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