PNWD--1980-06-HEDR

DE93 005105

HANFORD ENVIRONMENTAL DOSE RECONSTRUCTION PROJECT

Monthly Report

November 1992

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Prepared for the Technical Steering Panel and the Centers for Disease Control under Contract 200-92-0503(CDC)/18620(BNW)

Battelle
Pacific Northwest Laboratories
Richland, Washington 99352

MASTER

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Monthly Report

November 1992

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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 by Battelle Pacific Northwest Laboratories (BNW) under contract with the Centers for Disease Control (CDC). The Technical Steering Panel (TSP), which is composed of experts in numerous technical fields related to the project, provides technical direction of the project.

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

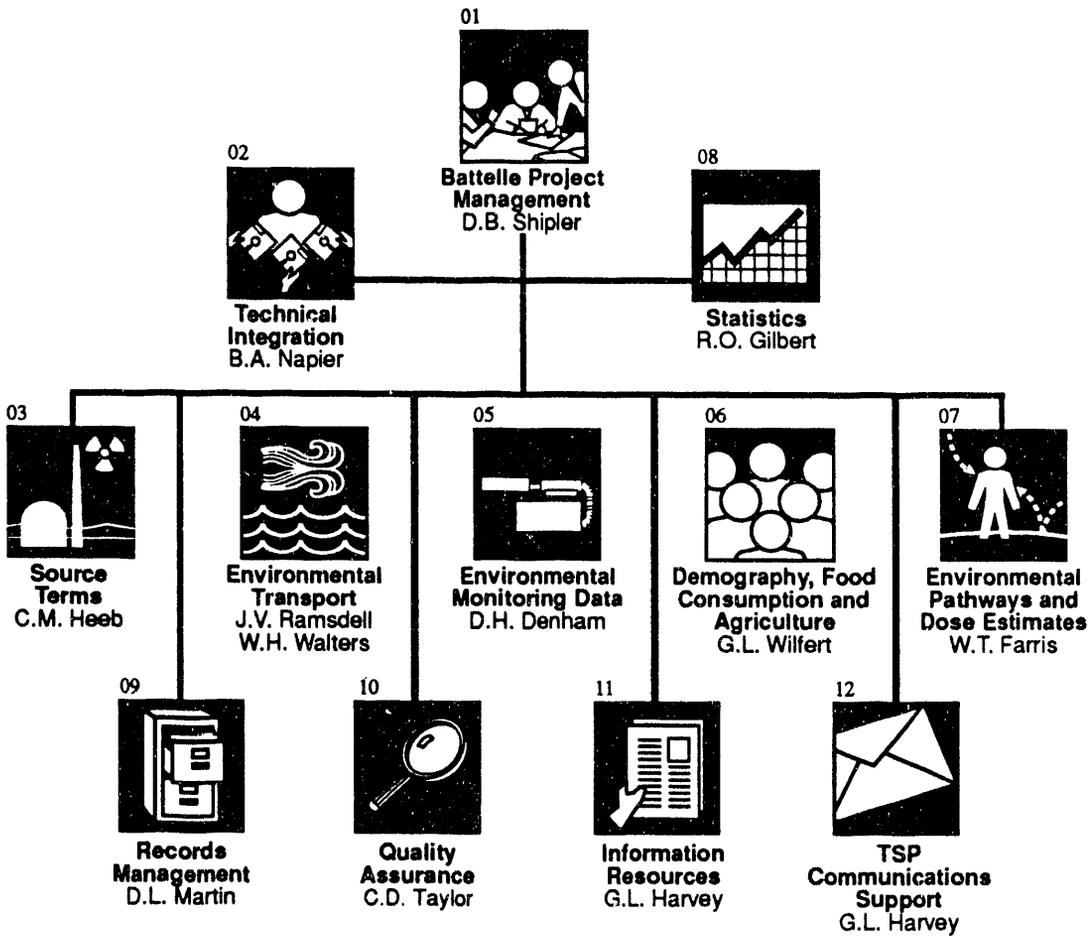


Figure 1. Organizational Structure of the HEDR Project

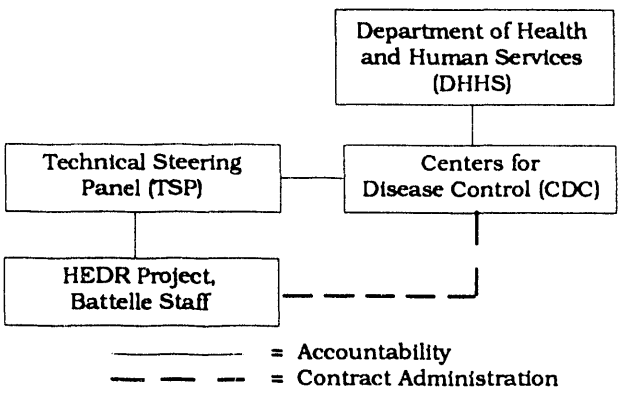
Table 1. Status of Directives[a]

		Complete	Ongoing
88-1	Proposals	x (modified 2/11/91)	
88-2	Vegetation		x
88-3	Status Reports		x
88-4	Ground Water	x	
88-5	Maps	x	
88-6	Resumes	x	
89-1	Indian Tribes	x (work now directed by TSP)	
89-2	Bioassay Data	x	
89-3	Document Handling	x	
89-4	Reactor Purging		x
89-5	Modeling Approach	x	
89-6	Meeting Materials		x
89-7	Technical Communication	x	
89-8	Phase II Planning	x	
89-9	Project QA Plan	x	
89-10	Contracts with Tribes	x	
90-1	Project Direction (Task Plans)		x
90-2	Dose Cut-Off Limit	x	
92-1	Demography, Food, and Agriculture Tasks		x
92-2	Dose Code Development		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 (HEDR) Project is to estimate the radiation doses that individuals and populations could have received from nuclear operations at Hanford since 1944. The project is being managed and conducted by Battelle Pacific Northwest Laboratories (BNW) under contract with the Centers for Disease Control (CDC). The independent Technical Steering Panel (TSP) provides technical direction.



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 members representing the states of Oregon, Washington, and Idaho, a representative of 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
- Demography, Food Consumption, and Agriculture
- 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.

The Demography, Food Consumption, and Agriculture 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 is also expected to be developed for several special population groups, including Native American tribes in the study area.

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.

Lifestyle and food habit information will be developed by the Fred Hutchinson Cancer Research Center (FHCRC) for use in the Hanford Thyroid Disease Study (HTDS).

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

Project reports and Hanford-originated 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 HEDR Project milestone activities. The following is a summary of activities conducted by HEDR staff in November 1992:

- reorganized the HEDR Project Management staff. W. Farris has been appointed Deputy Project Manager. B. Napier continues as Chief Scientist. M. Freshley will be the Assistant Project Manager. P. Eslinger will lead Subtask 0702 (Path and Dose Code Development and Documentation), and S. Finch will be the Project Administrator. P. Chevalier has accepted the position of secretary.
- began a process to more closely align project scope with contract deliverables. This focusing process has resulted in the deletion of one report and seven letter reports originally scheduled but not required by the contract or the TSP work plan. The respective task sections and the milestone chart in Appendix A identify the affected reports.
- reviewed the status, understanding, and direction of the dose code recovery effort. Determined that we are headed in the right direction but that we need the results of planned studies to provide a better basis for estimating cost and schedule. A draft software development plan has been written and will be reviewed internally.
- conducted a comprehensive study of atmospheric pathways and radionuclides as part of scoping the revised dose codes
- prepared a scoping study on the relative importance of various contributors to the dose from the milk pathway
- published the final report, *Literature and Data Review for the Surface-Water Pathway: Columbia River and Adjacent Coastal Areas*. The former draft document number of PNL-8083 HEDR has been replaced by PNWD-2034 HEDR (Milestone 0404A).
- ran and tested the pilot models for the dose code. When the quality assurance (QA) of the tests is completed, scoping and benchmarking studies can begin. The Pilot Software System will also be used to run case studies needed for developing the sensitivity/uncertainty analysis plan (Milestone 0803A).
- declassified 167 Hanford-Site originated documents, 13 of which are of potential interest/use to the HEDR Project
- provided the U.S. Department of Energy Richland Field Office (RL) Public Reading Room with 78 documents (6400 pages) of potential interest/use to the HEDR Project
- received $650K of fiscal year (FY) 1992 funding from the CDC on November 9, 1992

Major Problems or Changes and Action Taken

Complete funding from CDC still has not been received. Full funding is expected by early December.

Most of the Native American tribes will not have contracts in place with the CDC by January. The current business relationship with BNW will expire at the end of December. BNW will grant the tribes no-cost time extensions on their current contracts so that funds available under current work orders can be authorized for use to attend the January TSP Native American Working Group (NAWG) meeting. BNW will notify those tribes out of funds to contact the CDC.

Because of other HEDR priorities, such as the dose code and delays in placing a contract with Washington State University (WSU), the scheduled publication dates of several HEDR reports have not been met. (See the respective task sections and milestone chart in Appendix A for those that are affected.) Requests to change the publication schedule of each report are in process. The new publication dates will be announced in the HEDR monthly report as soon as they are determined.

Planned Work for the Next Three Months

- continue the scope focusing process with the Task Leaders by making detailed reviews of planned work needed to meet deliverables
- establish the dose code software requirements by December 14, 1992. This will allow us to finalize the preliminary code design. Changes after that date may only be made by written direction from the TSP.

- issue dominant radionuclide information (Milestone 0205B)
- publish the final version of *Iodine-131 Releases from the Hanford Site 1944 Through 1947* (PNWD-2033 HEDR Vols. 1 and 2) (Milestone 0302A)
- complete Iodine-131 source term data calculations, 1948-1991 (Milestone 0303B)
- determine effective release factors for the iodine-131 with control filters and silver reactors and develop effective release factors for ruthenium-103 and ruthenium-106 from the chemical separations plants (Milestone 0303D).
- complete wind field modeling report (Milestone 0402A)
- complete work on the Columbia River conceptual model and begin testing the Columbia River hydraulic numerical model (Milestone 0404B)
- complete meteorological database letter report (Milestone 0405A)
- publish environmental monitoring data final report (Milestone 0501A)
- publish vegetation data report--reconstructed conversion factors for vegetation pellet data (Milestone 0502A)
- issue the report documenting the population dose model (Milestone 0702B)
- complete the project sensitivity/uncertainty analysis plan (Milestone 0803A)
- complete corrective action response for audit observation B concerning commercial software, and implement the corrective action on the project records audit finding and three other observations concerning the annual assessment of the implementation of the project QA program, hand calculations, and training assignments

Budget Status

Figure 2 shows the budget status of the HEDR Project. Table A.1 in Appendix A shows FY 1993 costs and budget by task and subtasks. Figure A.2 shows TSP budget status. Figure A.3 shows Native American research budget status.

Capital Status

A request has been submitted to the U.S. Department of Energy (DOE) for $75K of FY 1993 funding. This request is the balance of a $150K FY 1992 request that was funded at $75K.

1. ID (Contract) Number:	2. Program/Project Title:	3. Reporting Period:
200-92-0503 (CDC) 18620 (BNW)	HANFORD ENVIRONMENTAL DOSE RECONSTRUCTION - BNW	November 1992

4a. Participant Name and Adress	4b. Client Name and Address	5. Start Date	6. Completion Date
Battelle, Pacific Northwest Laboratories P.O. Box 999 Richland, WA 99352	CDC Atlanta, GA 30333	October 1992	September 1993

7. FY 93 | 8. Months

9. Cost Status

a. $ Expressed in: Thousands

b. B&R No./ Subaccount No. 18620

c. FIN No.

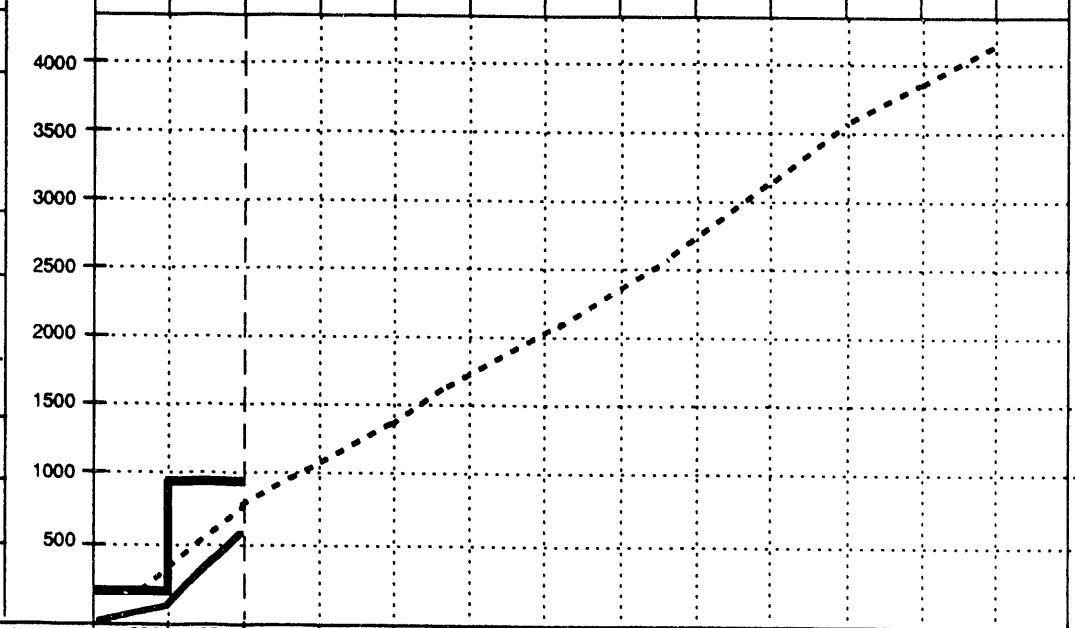
d. Actual Costs Prior Years 14,460 (a)

e. FY Budget 4,095 (b)

f. Total Budget

g. FY Funds Auth. 934 (c)

h. Total Funds Auth. 15,395 (d)



Costs	O	N	D	J	F	M	A	M	J	J	A	S	FY94
i. Planned	298	377	343	360	347	380	354	363	374	307	296	296	
j. Actual	184	349											
k. Variance	114	28											
l. Cum Planned	298	675	1018	1378	1725	2105	2459	2822	3196	3503	3799	4095	
m. Cum Actual	184	533											
n. Cum Variance	114	142											

10. Legend: Planned - - - - - Actual ——— Funds Auth. ▬▬ 90% Funds Spent ▷ Time Now

(a) "Actual costs prior years" excludes TSP costs but includes Native American research costs through FY 1991. (TSP prior year costs are shown separately in Figure A.2.) (b) Projected FY budget excludes TSP and Native American research budgets. (c) "FY Funds Authorized" includes carryover and current fiscal year funding that has been received. (d) "Total Funds Authorized" is for FY 1988-1993; it excludes capital, TSP funding, and FY 1992 funding for Native American research.

11. Name of Project Manager
D. B. SHIPLER

Figure 2. HEDR Project Budget Status - Battelle Pacific Northwest Laboratories

Acronyms and Abbreviations

AP	Associated Press
BNW	Battelle Pacific Northwest Laboratories
CAT	Coeur d'Alene Tribe
CDC	Centers for Disease Control
CIDER	calculation of individual doses from environmental radionuclides (computer code)
CT	Colville Tribe
CTUIR	Confederated Tribes of the Umatilla Indian Reservation
DESCARTES	dynamic estimates of concentrations and accumulated radionuclides in terrestrial environments (computer code)
DOE	U.S. Department of Energy
DOE-HQ	U.S. Department of Energy Headquarters
DQO	Data Quality Objective
FHCRC	Fred Hutchinson Cancer Research Center
FY	fiscal year
GENII-S	generation II-SUNS (computer code)
HEDR	Hanford Environmental Dose Reconstruction
HEDRIC	Hanford Environmental Dose Reconstruction Integrated Codes
HHIN	Hanford Health Information Network
HNIS	Health and Nutrition Information Service
HTDS	Hanford Thyroid Disease Study
IAEA	International Atomic Energy Agency
IHS	Indian Health Service
KT	Kalispel Tribe
NAS	National Academy of Sciences
NAWG	TSP Native American Working Group
NFCS	National Food Consumption Survey
NPT	Nez Perce Tribe
NTIS	National Technical Information Service
OMB	Office of Management and Budget
PNL	Pacific Northwest Laboratory (operated for DOE by Battelle Memorial Institute)
QA	quality assurance
RATCHET	regional atmospheric transport code for Hanford emissions tracking (computer code)
RFP	request for proposal
RIDS	records inventory and disposition schedule
RL	U.S. Department of Energy Richland Field Office
RM	reactor model (computer code)
SESRC	Social and Economic Sciences Research Center (Washington State University)
SOW	statement of work
ST	Spokane Tribe
STRM	source term release model (computer code)
SUNS	sensitivity/uncertainty system
TSP	Technical Steering Panel
USDA	U. S. Department of Agriculture
VAMP	validation of model predictions program
WST	Warm Springs Tribe
WSU	Washington State University
YIN	Yakima Indian Nation

Contents

Figures

Tables

Task 01
Battelle Project Management

Objective

The objective of the Battelle Project Management Task is to provide project planning, control, and management of Battelle dose reconstruction work in accordance with the Centers for Disease Control (CDC) contract and Technical Steering Panel (TSP) technical direction.

Progress

- reorganized the HEDR Project Management staff. W. Farris has been appointed Deputy Project Manager. B. Napier continues as Chief Scientist. M. Freshley will be the Assistant Project Manager. P. Eslinger will lead Subtask 0702 (Path and Dose Code Development and Documentation), and S. Finch will be the Project Administrator. P. Chevalier has accepted the position of secretary.
- began a process to more closely align project scope with contract deliverables. This focusing process has resulted in the deletion of one report and seven letter reports originally scheduled but not required by the contract or the TSP work plan. The Task 01 report that has been eliminated is Milestone 0101H, Project Management Plan Revision, due August 1993. The changes to the Project Management Plan will be made internally but not published as a report.
- reviewed the status, understanding, and direction of the dose code recovery effort. Determined that we are headed in the right direction but that we need the results of the planned dose code studies to provide a better basis for estimating cost and schedule. The revised and clarified dose code development requirements were faxed to the TSP and CDC. D. Barth, TSP, met with HEDR Project staff November 13, to convey the TSP's comments on the revised dose code development requirements and to review the status and progress.
- ran and tested the pilot models for the dose code. When the QA of the tests is completed, the scoping and benchmarking studies can begin.
- received $650K of FY 1992 funding from the CDC on November 9, 1992
- presented a poster paper on the HEDR atmospheric environmental accumulation model and delivered a presentation on HEDR Data Quality Objectives (DQOs) at the Annual meeting of the Society of Environmental Toxicology and Chemistry in Cincinnati, Ohio

Major Problem Areas or Changes and Action Taken

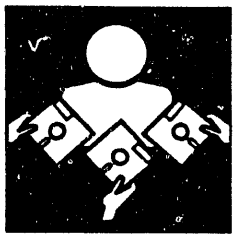
Complete funding from CDC still has not been received. Full funding is expected by early December.

Variance

The cumulative cost underrun was caused by an anticipated procurement in computer system administration that has been delayed.

Planned Work for the Next Three Months

- continue the scope focusing process with the Task Leaders by making detailed reviews of planned work needed to meet deliverables
- establish the dose code software requirements by December 14, 1992. This will allow us to finalize the preliminary code design. Changes after that date may only be made by written direction from the TSP.
- begin revision of the integrated task plans ❑



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 0204A - Letter Report: Data Management Plan, due May 1992 and rescheduled to October FY 1992

- determined that this should not be issued as a separate report. The planned work will continue with the requirements for data management being specified in the software development plan.

Milestone 0205B - Letter Report: Key Radionuclides, Rev. 1, due May 1992 and rescheduled to October 1992

- conducted a comprehensive study of atmospheric pathways and radionuclides as part of scoping the revised dose codes. As parts of this task are completed, they will be sent separately in letter form to the TSP for review. Two initial drafts were prepared in November. One deals in detail with exposure pathways in 1945, the other with cumulative releases and cumulative impacts over the period 1945-1972. These will now begin the internal review process.

Milestone 0205E - Letter Report: Project Model Validation Plan, due April 1993

- determined that this should not be issued as a separate report. The planned work will continue. Plans for model validation will be formalized internally. Validation results will be included in Milestone 0803B, Model Reliability Report.

Milestone 0205F - Letter Report: Output Display Document, due September 1993

- determined that this should not be issued as a separate report. Specifications for the output display will be formalized internally only.

Other Activities

- participated in external review of code recovery activities
- prepared a scoping study on the relative importance of various contributors to the dose from the milk pathway. Several recommendations were made and incorporated into the revised code design requirements.
- developed an algorithm for computation of doses to developing fetuses and added to the revised code design requirements
- developed an algorithm to compute doses to nursing infants, allowing intake of radionuclides by both mother and infant, and added to the revised code design requirements
- started work on additional scoping studies. These involve defining the requirements for temporal and spatial scales of the revised dose code and additional proposed pathways of exposure. Upon completion, each of these studies will be transmitted to the TSP as letters.

Major Problem Areas or Changes and Action Taken

The dose-code reconstruction efforts continue to directly impact the planned schedule of this task. Most of the work underway has been in response to TSP Directive 92-2.

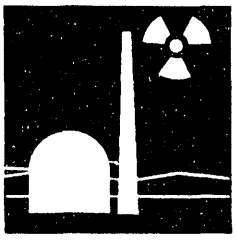
To ensure success of the dose-code recovery effort, some time has been spent coordinating the development of design specifications for a suite of analogous surface-water codes with Task 07, Environmental Pathways and Dose Estimates.

Variance

No significant cumulative variance. Spending is almost exactly as planned. However, much additional work is being performed with funding supplied by BNW.

Planned Work for the Next Three Months

- issue dominant radionuclide information (Milestone 0205B)
- coordinate recovery of atmospheric transport dose codes
- coordinate activities directed at develop surface-water dose codes
- coordinate activities with the FHCRC ❑



Task 03 Source Terms

Objective

Source terms are the amount and type of radioactive materials released to the environment. The objective of the Source Terms Task is to 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.

Progress

Milestone 0305A - Letter Report: Radionuclide Release Model, due September 1993

- determined that this should not be issued as a separate report. A description of the Phase I component of the source term release model (STRM) was included in the Milestone 0303A report, *Documented Significant Airborne Radionuclides, 1944-1957* (PNL-7868 HEDR). The remaining model components will be described in the appendices of Milestone 0303B, 0303D, and 0304B reports, as appropriate.

Milestone 0307A - Letter Report: Hanford Operations, 1944-1991, due September 1992 and rescheduled to October 1992

- determined that this should not be issued as a separate report. The data on reactor and separations plant operation will be reported in the Milestone 0303B, 0303D, and 0304B reports, as appropriate.

Radioactive Releases to Air (Subtask 0303)

- initiated work on this subtask. Emphasis was on reconstructing the operations of the chemical separations facilities. This information will be used to estimate releases of iodine-131 for the period 1948 through 1991 from these facilities.

Radioactive Releases to Water (Subtask 0304)

- continued work on this subtask. Reconstruction of reactor operations through 1971 are nearly complete. A reactor database was completed. The database information will be used to estimate reactor releases to the Columbia River. The database information includes power level, operating efficiencies, and water temperatures. Reactor effluent water activity measurements were assembled from Hanford documents to provide a basis for the algorithms which will be used to calculate releases for the periods where no measurements are available.

Major Problem Areas or Changes and Action Taken

None.

Variance

No significant cumulative variance.

Planned Work for the Next Three Months

- address TSP comments and publish the final version of *Iodine-131 Releases from the Hanford Site 1944 Through 1947* (PNWD-2033 HEDR Vols. 1 and 2) (Milestone 0302A)
- complete iodine-131 source term data calculations, 1948-1991 (Milestone 0303B)
- determine effective release factors for the iodine-131 with control filters and silver reactors and develop effective release factors for ruthenium-103 and ruthenium-106 from the chemical separations plants (Milestone 0303D)
- develop a method for calculating releases to the Columbia River based on reactor operating data (Milestone 0304B)
- develop a fuel failure record and classification system which will permit an estimate of radionuclides released to the Columbia River from failed fuel elements (Milestone 0304B) ❑

Task 04
Environmental Transport

Objective

The objective of the Environmental Transport Task is to 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 groundwater is studied.

Progress

Milestone 0402A - Wind Field Modeling White Paper, due FY 1991 and rescheduled to December 1992

- received revised source terms. The work will still be delayed, however, until the regional atmospheric transport code for Hanford emissions tracking (RATCHET) computer runs for the dose model sensitivity evaluation are completed December 1, 1992.

Milestone 0404A - Columbia River Pathway Summary Report, due December 1991, rescheduled to April 1992 and completed (PNWD-2034 HEDR)

- published the final report with the title, *Literature and Data Review for the Surface-Water Pathway: Columbia River and Adjacent Coastal Areas*. The former draft document number of PNL-8083 HEDR has been replaced by PNWD-2034 HEDR.

Milestone 0404B - Letter Report: Columbia River Conceptual Model, due September 1992 and rescheduled to December 1992

- determined that this should not be issued as a separate report. A description of the Columbia River conceptual model will be included in Milestone 0404C, Report on Columbia River Modeling Approach. The subcontract for work on the conceptual model has been placed with WSU.

Milestone 0405A - Letter Report: Interim Atmospheric Model Database + Meteorological Data Report (0402D), due September 1992 and rescheduled to October 1992

- completed peer review and revision of the draft. Meteorological data for 1948 and 1949 are being entered in the database.

Other Activities

- completed RATCHET calculations for 100 realizations of 1945, 1946, and 1947 data for use in dose model sensitivity studies conducted in Task 08, Statistics. An additional 100 realizations of 1945 were computed for use in evaluating the relative magnitudes of the contributions of the source term, atmospheric transport, and dose models to uncertainty in dose estimates.

Major Problem Areas or Changes and Action Taken

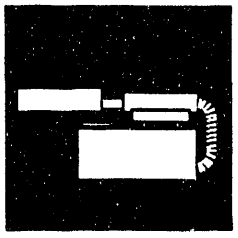
The publication of Milestone 0402A and 0405A reports has been delayed. Requests for change of publication schedules are in process.

Variance

No significant cumulative variance for Subtasks 0402 and 0405. The cumulative cost underrun for Subtask 0404 was caused by the delay in placing a contract with WSU.

Planned Work for the Next Three Months

- complete wind field modeling report (Milestone 0402A)
- complete work on the Columbia River conceptual model and begin testing the Columbia River hydraulic numerical model (Milestone 0404B) the results of which will be included in Milestone 0404C, Report on Columbia River Modeling Approach.
- publish meteorological database letter report (Milestone 0405A)
- continue meteorological data entry, 1948-1949 (Milestone 0405B)
- conduct RATCHET tests
- continue model sensitivity/uncertainty tests ❑



Task 05
Environmental Monitoring Data

Objective

The objective of the Environmental Monitoring Data Task is to search, retrieve, 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 the Environmental Pathways and Dose Estimates Task to estimate radiation doses and by the Environmental Transport Task to calibrate and validate computer models.

Progress

Milestone 0501A **- Environmental Monitoring Data Final Report, due FY 1991 and rescheduled to October 1992**

- began editing the revised draft document

Milestone 0502A **- Vegetation Data Report (1945-1951) due FY 1991 and rescheduled to November 1992**

- edited the draft document

Major Problem Areas or Changes and Action Taken

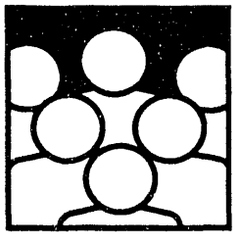
Because of extended travel by the Task Leader and jury duty by the Deputy Task Leader, the publication dates for Milestone 0501A, 0502A, and 0502B (vegetation monitoring data) reports have been delayed. Requests for change of publication schedules are in process.

Variance

No significant cumulative variance.

Planned Work for the Next Three Months

- publish environmental monitoring data final report (Milestone 0501A)
- publish vegetation data report--reconstructed conversion factors for vegetation pellet data (Milestone 0502A)
- prepare summaries of the meetings held in February and March 1989 with veteran Hanford employees, who had been directly involved in environmental monitoring and analysis during the 1945-1951 period
- continue coordination with HEDR task leaders to assure that the data being supplied by Task 05 meets the needs of their tasks ❑



Task 06
Demography, Food Consumption, and Agriculture

Objective

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

Progress

Milestone 0602C - Food Consumption Report, General Population, due December 1992

- continued development of the food consumption backcasting ratios for 1945:1977, 1951:1977, and 1957:1977. HEDR staff are working to econometrically demonstrate the stability over time of the ratio backcasting approach for the key dose groups of milk, eggs, lettuce, and spinach.
- concluded that Battelle staff should conduct the QA of the individual food type grouping exercise. This decision was based on the premise that Battelle staff have the needed familiarity with dose pathways to correctly group foods for analysis of dose.

Milestone 0603D - Milk Production/Distribution Report, 1945-1991, due March 1993

- continued work toward obtaining clearance from Office of Management and Budget (OMB) of the planned survey
- met with the CDC and the FHCRC (who have recently been through the OMB clearance procedure) to further discuss how to present clearance information
- evaluated alternative to elicit milk producer/distributor and milk processor/distributor data through workshops and consultations with experts

Native American Data (Subtask 0605)

- participated in the NAWG's Executive Committee in Seattle
- provided technical assistance to the Umatilla Tribe regarding the design of the food-consumption interview
- provided technical assistance to the Kalispel and Spokane Tribes regarding their response to the CDC request for proposal. Reviewed the other tribes' progress on the preparation of their proposals.
- made substantial progress on literature review of Native American time spent outdoors
- revised the letter report containing a bibliography on Native American traditional food preparation and consumption practices
- made substantial progress on examining the feasibility of using the Geographical Information System technology to represent tribal residential location data, using unpublished population distribution data collected for Yakima, Nez Perce, and Colville tribal members by D. Walker in the mid-1960s

Major Problem Areas or Changes and Action Taken

The contract publication date for the Milestone 0602C report is December 1992, not March 1993 as denoted in the *Integrated Task Plans for the Hanford Environmental Dose Reconstruction Project, FY 1992 Through May 1994* (PNWD-2020 HEDR). A request for change of publication schedule is in process.

Most of the Native American tribes will not have contracts in place with the CDC by the time of the next scheduled NAWG and TSP meetings in January. The current business relationship with

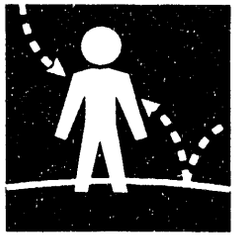
BNW will expire at the end of December. BNW will grant the tribes no-cost time extensions on their current contracts so that funds available under current work orders can be authorized for use to attend the January NAWG meeting. BNW will notify those tribes out of funds to contact the CDC

Variance

The cumulative cost underrun was caused by a delay in placing an inter-laboratory authorization with the Battelle Seattle Research Center for Native American research support and by a delay in collecting the farm producer information.

Planned Work for the Next Three Months

- continue to develop the food consumption back-casting ratios (Milestone 0602C)
- conduct QA of the individual food type grouping exercise (Milestone 0602C)
- continue to obtain clearance from OMB of the planned survey (Milestone 0603D)
- organize a workshop and consultations with experts to obtain the milk producer/distributor and milk processor/distributor data (Milestone 0603D)
- complete revisions of infant feeding practices literature review and annotated bibliography, based on internal review comments
- contribute to completion of standard data-collection protocol, including data-quality procedures and questionnaire design
- attend meeting of the NAWG Executive Committee in Seattle, Washington, December 16, and NAWG/TSP meetings in Richland, Washington in January
- plan and facilitate training sessions for the NAWG regarding procedures for interviewing key informants: interview guide development, informant selection, data record management, content analysis
- provide technical assistance to tribal representatives who plan to come to Seattle, Washington to review unpublished materials stored at the Sand Point Federal Archives facility
- complete literature review of Native American time spent outdoors
- review and evaluate preliminary data submitted to BNW by the tribes ❑



Task 07
Environmental Pathways and Dose Estimates

Objective

The objective of the task is to 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, representative individuals, and specific individuals. These calculations include doses via direct transfer of radionuclides from concentrations in air and water to people (such as 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.

Progress

Milestone 0702B - Documentation Report of Population Dose Model, Major Pathways, due September 1992 and rescheduled to October 1992

- made limited progress on this milestone because of the activities on the corrective action for Task 0702

Milestone 0703C - Letter Report: Key Radionuclide Parameters, due July 1993

- continued work on this milestone. At this time ruthenium-103 and ruthenium-106 are the only additional air pathway radionuclides. The list of surface-water key radionuclides has not been determined. The additional parameters required to estimate air pathway doses for ruthenium-103 and ruthenium-106 will be added to the previously issued Milestone 0703B letter report when it is published in its final version. The surface-water parameters will be issued in a separate document.

Milestone 0705A - Report on Iodine-131 Doses, 41 x 51 Grid, 1944-1991, due June 1993

- began initial scoping of this milestone

Milestone 0705B - Doses from Key Radionuclides in Columbia River Water, 1944-1991, due September 1993

- began initial scoping of this milestone

Milestone 0705C - Doses from Key Radionuclides Released to Air (excluding Iodine-131), 1944-1991, due September 1993

- began initial scoping of this milestone

Pathways and Dose Code Development and Documentation (Subtask 0702)

- conducted no CDC-funded work on this task in November. BNW is currently funding code development planning efforts prior to the beginning of the CDC-funded coding work. In accordance with the TSP Directive 92-2, Battelle staff are developing a plan for the completion of the environmental accumulation and dose codes for the air pathway. A report summarizing the strategy for developing the improved environmental accumulation and dose codes is being prepared for delivery to the TSP no later than December 31, 1992.
- included the following activities in the planning effort: 1) listing all code requirements, 2) developing a set of code specifications, 3) completing model scoping calculations, 4) completing code benchmarking studies, and 5) defining code data requirements. A draft version of the code requirements was delivered to the TSP during November.

Major Problem Areas or Changes and Action Taken

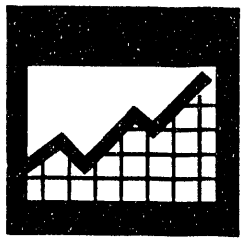
The publication of the Milestone 0702B report has been delayed. A request for a change of the publication schedule is in process.

Variance

The cumulative cost underrun was caused by a delay in receiving the Native American information necessary to calculate that dose.

Planned Work for the Next Three Months

- continue planning efforts for the coding activities under Task 0702
- issue the report documenting the population dose model (Milestone 0702B)
- continue work on the parameters and dose factors report for key air and river radionuclides (Milestone 0703C)
- continue limited work on the dose calculations for Milestones 0705A, 0705B, 0705C and 0705D ❑



Task 08
Statistics

Objective

The objective of the task is to provide statistical support to other 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. Sensitivity analyses results will be used to focus resources where the benefit in terms of accurate dose estimates is greatest. Uncertainty analyses enable the project 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

Milestone 0803A - Letter Report: Project Sensitivity/Uncertainty Analysis Plan, due August 1992 and rescheduled to December 1992

- finished developing the Pilot Software System that will be used to run case studies needed for developing the sensitivity/uncertainty analysis plan
- developed information needed for case studies
- continued testing the Pilot Software System

General Statistics Support (Subtask 0802)

- met with Task 03 (Source Term) task leader to discuss statistical analysis of radionuclides released to the river
- met with Task 05 (Environmental Monitoring Data) staff to discuss data needs for HEDR models
- interacted with Task 06 (Demography, Food Consumption and Agriculture) staff and the Social and Economic Sciences Research Center (SESRC) at WSU to develop materials for Section B (Statistical Methods) of the OMB review and approval form needed to obtain consent to conduct the HEDR milk-producer survey for the 19-county study area
- drafted Section B of the OMB approval form for the milk-producer survey questionnaire
- met with key task leaders to evaluate the option of holding workshops to obtain milk-production information instead of using a producer-survey questionnaire
- reviewed draft HEDR reports

Analysis of Model Reliability (Subtask 0803)

- prepared data input to the Task 03 (Source Term) reactor model to obtain realizations of 1948 Iodine-131 releases to air
- continued to test the Pilot Software System used to create test cases for sensitivity/uncertainty analyses and screening studies
- began documenting the Pilot Software System

Major Problem Areas or Changes and Action Taken

Other workload priorities have been too great to permit meeting the December due date for Milestone 0803A. A delay in the published report will not affect setting the date for the sensitivity/uncertainty workshop nor providing the TSP with the written plan at least one month before the workshop. A request for change of publication schedule is in process. When published, the report will include the results from Milestone 0205E, Letter Report: Project Model Validation Plan.

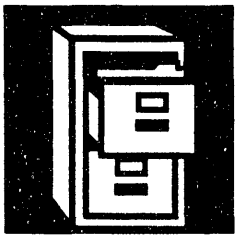
Variance

The cumulative cost overrun was caused by the temporary increased effort needed to develop and

verify the Pilot Software System which will be used to generate test cases for the sensitivity/ uncertainty workshop. Expenditures will decrease in December and future months.

Planned Work for the Next Three Months

- revise the Iodine-131 Conversion Factor Report in response to CDC and TSP comments (Milestone 0802A)
- complete the project sensitivity/uncertainty analysis plan (Milestone 0803A)
- continue planning for the sensitivity/uncertainty analysis workshop
- conduct sensitivity/uncertainty analysis of test cases
- complete work with dose code corrective action team
- continue providing task leaders with statistical support for data/information gathering and reporting
- review draft reports
- finish documentation of the Pilot Software System
- conduct final internal development review of the Pilot Software System
- place the Pilot Software System under configuration management and provide the code to independent reviewers for testing ❑



Task 09
Records Management

Objective

The objective of the Records Management Task is to provide storage and control of completed project records, maintain an automated inventory of all project documentation, and provide a reference service to project staff and the TSP.

Progress

- received project records from the HEDR Project Office - 66 records totalling 2,853 pages
- verified, processed, and stored project records - 37 records totalling 887 pages
- transferred three packages of processed project records to the RL Public Reading Room - 12 records totalling 691 pages

Major Problems or Changes and Action Taken

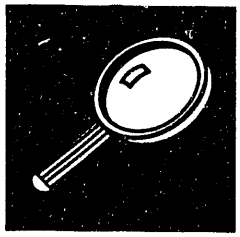
None.

Variance

The cumulative cost underrun was caused because records management activity was less than expected.

Planned Work for the Next Three Months

- continue processing incoming project records
- continue transferring processed project records to the RL Public Reading Room
- provide assistance to the HEDR Project Office in processing records to the Records Center while the project records custodian is on leave ❑



Task 10
Quality Assurance

Objective

The objective of this task is to ensure continuous 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

- reviewed and provided comments on the Milestone 0405A letter report, Interim Atmospheric Model Database + Meteorological Data
- provided QA assistance to the HEDR staff in implementing the software quality assurance procedures related to the Source Term Task Milestone 0302A
- completed corrective action responses for the project records audit finding and observations A, C, and D concerning the annual assessment of the implementation of the project QA program, hand calculations, and training assignments. BNW requested an extension of the due date to December 11, 1992 for the corrective action response to audit observation B concerning commercial software.
- completed corrective action responses for deficiency reports identified during a surveillance performed on the HEDR Project training records
- developed a form for use as a Hand Calculation Cover Sheet. The form includes all the information needed to document hand calculations quickly and accurately.
- reviewed draft design and user's manuals for Task 0803 (Analysis of Model Reliability) codes
- attended a meeting with D. Barth, TSP, and HEDR Project staff to discuss the TSP's comments on the software requirements specification document for the HEDR air pathway environmental accumulation and dose codes
- attended the peer review meetings on the dose code

Major Problem Areas or Changes and Action Taken

None.

Variance

The cumulative cost overrun was caused by 1) a change in quality assurance personnel with consequent learning time involved, 2) additional quality assurance performed to close-out previously identified quality deficiencies, and 3) an increased amount of time required to verify software QA.

Planned Work for the Next Three Months

- finalize the HEDR decision support plan and issue the implementing procedures for the different techniques described in the plan
- continue performing oversight activities to check for compliance to HEDR Project technical, QA, and DQO requirements
- develop action-tracking procedures to be used to document results of the technical staff meetings
- complete corrective action response for audit observation B and implement the corrective action on the project records audit finding and three other observations. ❑

Task 11
Information Resources

Objective

The objective of the Information Resources Task is to work with other tasks 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

Milestone 1103B - Letter Report: Report Summarizing Information Resources Work, due September 1993

- determined that this information will be addressed in a letter to the TSP rather than issued as a formal letter report

Other Activities

- copied and mailed to B. Schleien three HEDR-related documents
- provided assistance to N. Germond, TSP, and K. CharLee, TSP staff, during their review of unclassified documents at the Records Holding Area
- added new citations to the tracking system that now contains more than 6450 citations
- declassified 167 Hanford-Site originated documents, 13 of which are of potential interest/use to the HEDR Project. Table 11.1 shows the status of declassification to date.
- provided the RL Public Reading Room with 78 documents (6400 pages) of potential interest/use to the HEDR Project. A title listing of these reports is given in Appendix B.
- verified references in several HEDR reports

RL Public Reading Room Activity

During the month, the RL Public Reading Room had 8 HEDR patrons and distributed 11 HEDR reports.

Table 11.1. Declassification of Hanford-Site-Originated Documents

Documents Declassified	Hanford Historical	HEDR-Related[a]
March 1987-September 1987 (FY 1987)	35	27
October 1987 through September 1988 (FY 1988)	52	37
October 1988 through September 1989 (FY 1989)	186	177
October 1989 through September 1990 (FY 1990)	455	236
October 1990 through September 1991 (FY 1991)	1323	599
October 1991 through September 1992 (FY 1992)	2862	554
October 1992 through November 1992 (FY 1993)	526	33
TOTAL (March 1987 - November 1992)	5439	1663

(a) Reported in HEDR monthly reports and included in a HEDR master listing in the RL Public Reading Room. Some of these are from the list requested by the TSP and the public.

Major Problem Areas or Changes and Action Taken

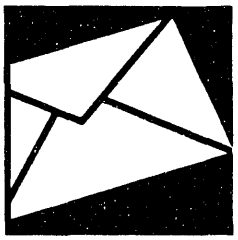
None.

Variance

The cumulative cost underrun was caused by less effort than anticipated in document declassification.

Planned Work for the Next Three Months

- identify, search and retrieve documents to support Task 03
- prepare to support visiting TSP members during document search efforts
- await direction and funding from the CDC (through RL) to prepare the title listing of Hanford-Site-originated reports which are currently classified and which address operations for 1961-1972 ❑



Task 12
TSP Communications Support

Objective

The objective of this task is to assist the TSP in developing competent 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

- provided a report to M. Blazek on TSP Directives 89-3, 89-6 and 89-7 to identify the activities completed and deliverables submitted
- provided copies of various documents and materials for TSP members, D. Walker and M. Blazek
- provided copies of maps depicting the HEDR study area and project grid to the Department of Ecology for transfer to Hanford Health Information Network use
- discussed collection and use of monitoring information at Lewiston Weather Station in the 1950s and 1960s with D. Petit, Lewiston Morning Tribune. Suggested documents and information that may be useful.
- provided general information about the HEDR and HTDS Projects to D. Andrus, Kent, Washington, and furnished appropriate toll-free phone numbers for more information
- assisted TSP staff to locate and reserve a facility to conduct the TSP public meeting planned for the evening of January 7, 1993 in Richland, Washington

Major Problem Areas or Changes and Action Taken

None.

Variance

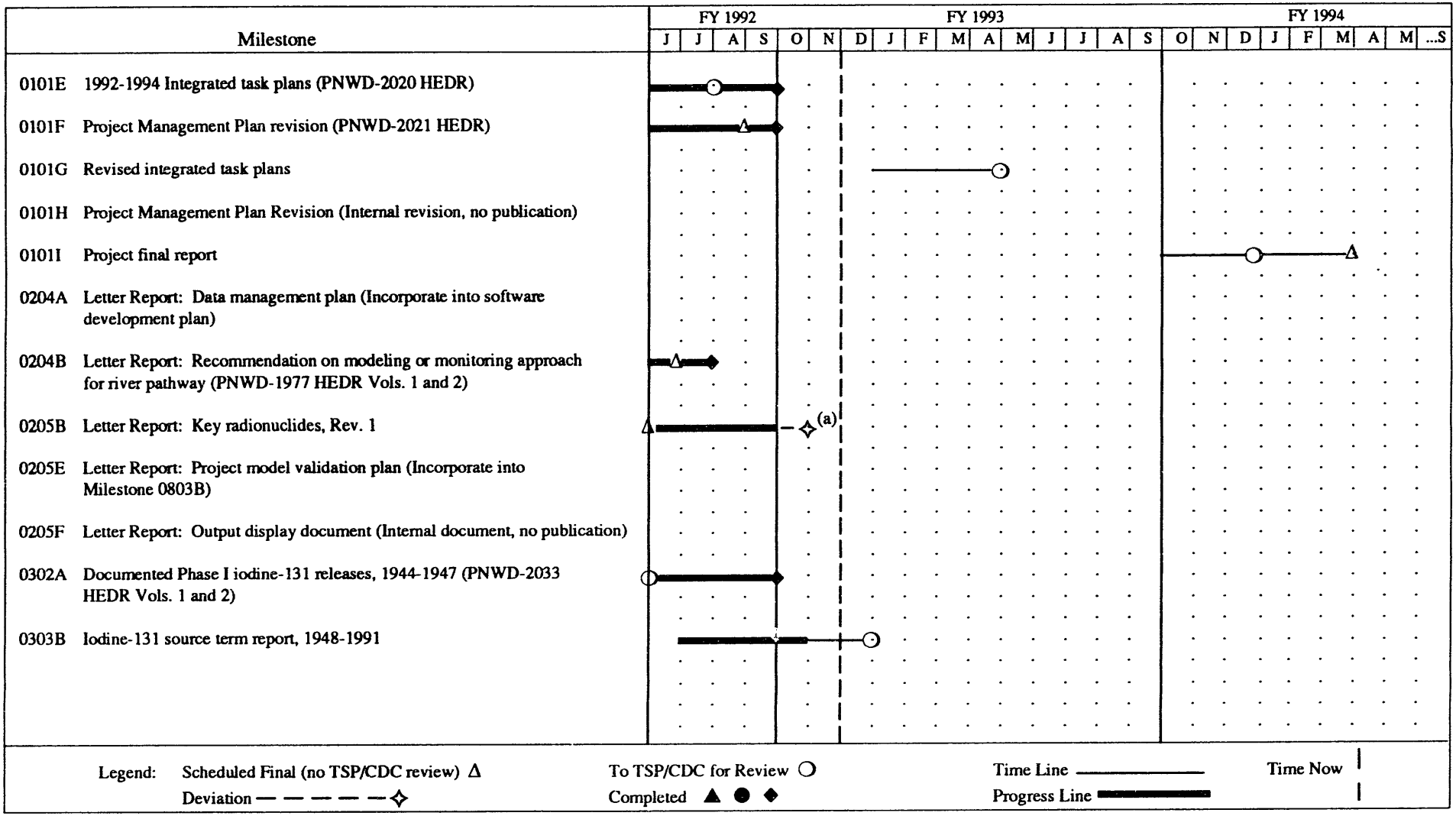
No significant cumulative variance.

Planned Work for the Next Three Months

- attend the TSP Communications Subcommittee meeting in Portland, Oregon, December 10, 1993
- attend the TSP Public and Communications Subcommittee meetings in Pasco, Washington, January 7-8, 1993
- review and compile media articles from July 1992 through present in preparation for the media review summary due in January 1993 ❑

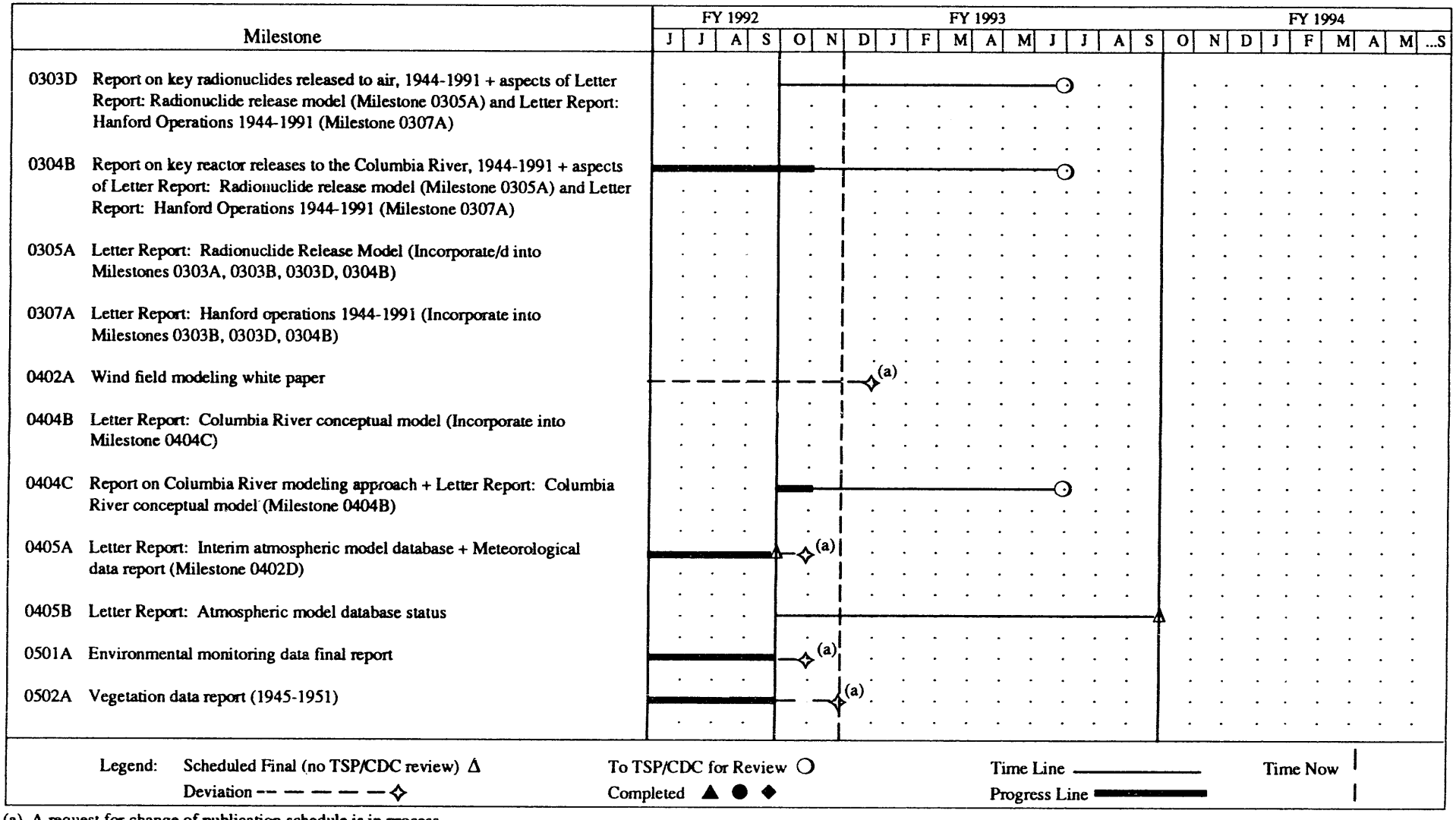
Appendix A

Milestones, Schedule, and Costs



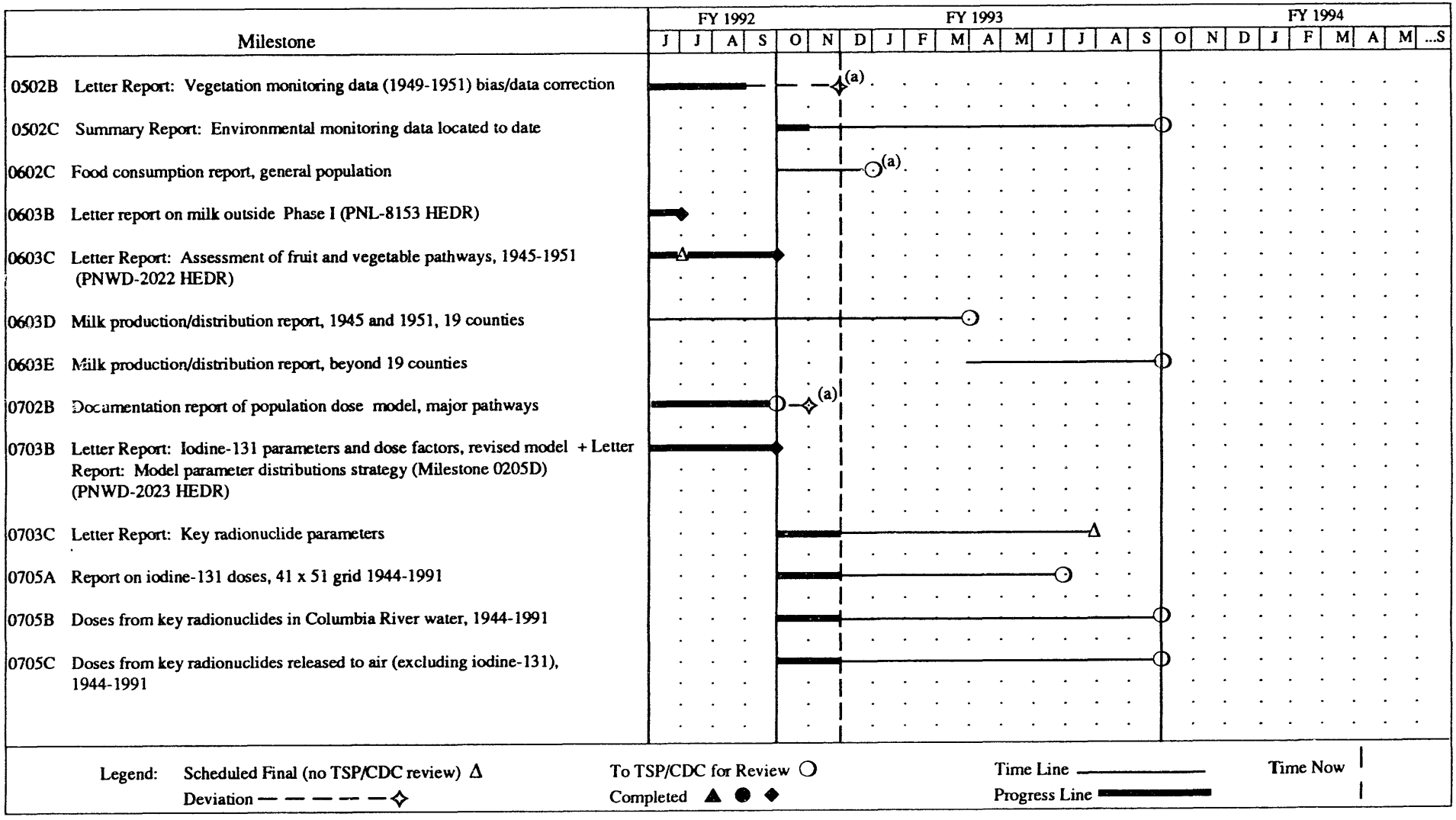
(a) A request for change of publication schedule is in process.

Figure A.1. HEDR Project Milestones



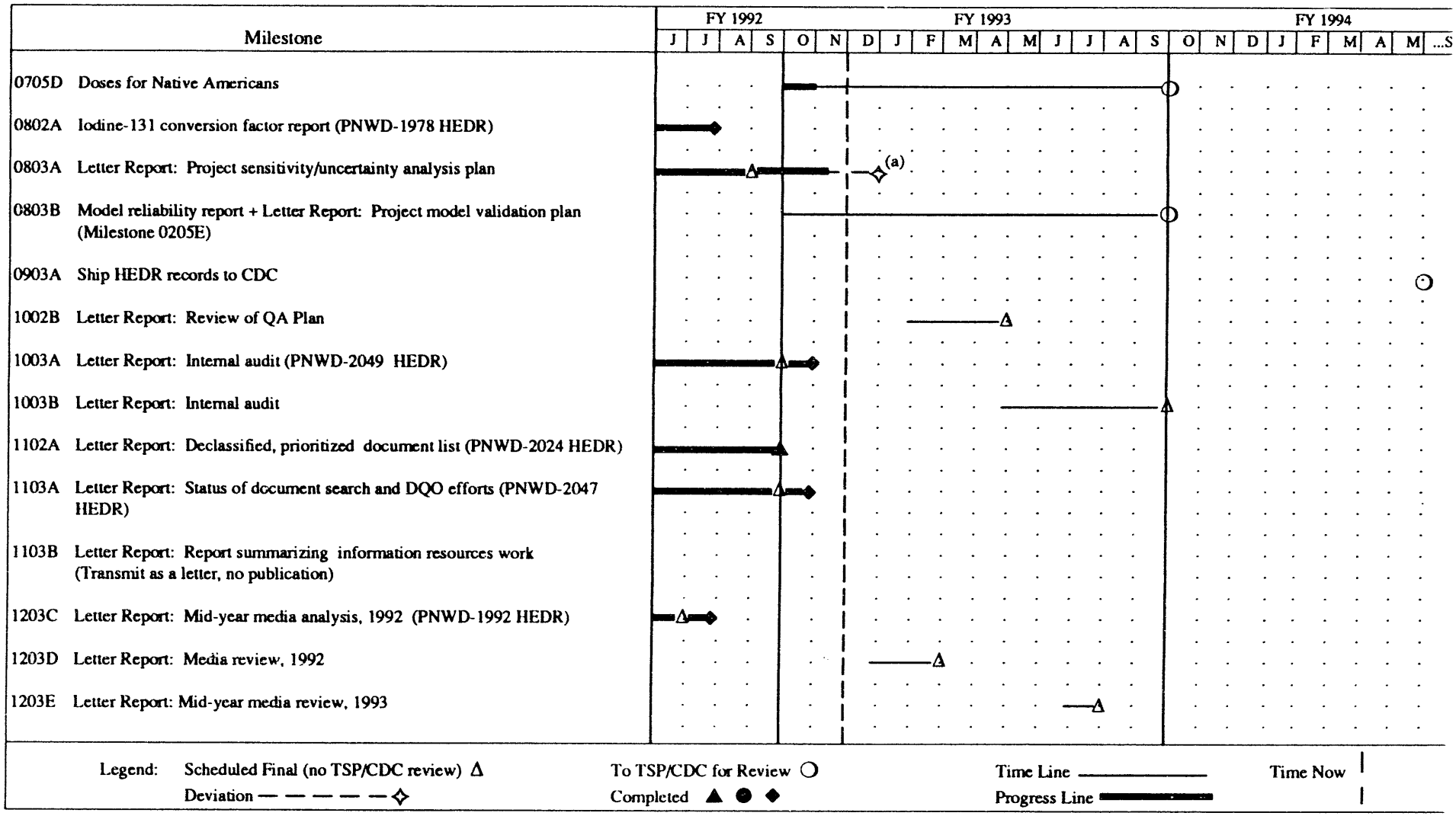
(a) A request for change of publication schedule is in process.

Figure A.1. HEDR Project Milestones (contd)



(a) A request for change of publication schedule is in process.

Figure A.1. HEDR Project Milestones (contd)



(a) A request for change of publication schedule is in process.

Figure A.1. HEDR Project Milestones (contd)

Table A.1. Cost Summary (Dollars in Thousands)

HEDR Project Tasks	November 1992			FY 1993 to Date (October 1992 - September 1993)							
	Labor $	Non-Labor $ (a)	Total $	Labor $	Non-Labor $ (a)	Total $	Cum Planned (b)	Cum Variance	CDC/TSP Approved FY Budget (c)	Funds Remaining	Budgeted FY Labor Hours
Task 01 - Project Management (d)											
0101 Project Planning & Control	84	8	92	90	8	98	102	4	606	508	6,648
0103 Project Administration	16	1	17	37	9	46	71	25	397	351	5,482
0104 Project Peer Review	0	0	0	0	0	0	5	5	40	40	341
Subtotal Task 01	100	9	109	127	17	144	178	34	1,043	899	12,471
Task 02 - Technical Integration											
0201 Tech Planning/Control/Rep	4	0	4	5	0	5	12	7	68	63	563
0204 Proj Tech Cord /Analysis	3	4	7	5	4	9	31	22	198	189	1,598
0205 Path & Dose Model Require	27	2	29	37	2	39	18	-21	134	95	1,216
Subtotal Task 02	34	6	40	47	6	53	61	8	400	347	3,377
Task 03 - Source Terms											
0301 Tech Planning/Control/Rep	4	0	4	4	0	4	7	3	37	33	309
0303 Rad Releases to Air	14	0	14	14	0	14	24	10	171	157	1,850
0304 Rad Releases to Water	15	0	15	29	0	29	27	-2	208	179	2,337
0305 Source Term Release Model	0	0	0	0	0	0	9	9	41	41	375
0307 Rad Release Data Avail/Rev	0	0	0	11	0	11	0	-11	0	-11	0
Subtotal Task 03	33	0	33	58	0	58	67	9	457	399	4,871

Table A.1. Cost Summary (Dollars in Thousands) (contd)

	November 1992			FY 1993 to Date (October 1992 - September 1993)							
	Labor $	Non-Labor $ (a)	Total $	Labor $	Non-Labor $ (a)	Total $	Cum Planned (b)	Cum Variance	CDC/TSP Approved FY Budget (c)	Funds Remaining	Budgeted FY Labor Hours
Task 04 - Environmental Transport											
0402 Atmospheric Model Develop	8	3	11	14	3	17	30	13	183	166	1,823
0404 Surface-Water Transport	5	2	7	10	1	11	24	13	221	210	1,880
0405 Atmospheric Model Databas	19	0	19	26	1	27	0	-27	0	-27	0
0406 Atmospheric Model Calculat	0	0	0	0	0	0	21	21	109	109	1,191
Subtotal Task 04	32	5	37	50	5	55	75	20	513	458	4,894
Task 05 - Environmental Monitoring Data											
0501 Tech Planning/Control/Rep	7	0	7	11	0	11	4	-7	24	13	185
0502 Terrestrial Monitoring Data	10	0	10	20	0	20	27	7	98	78	1,161
0504 Surface-Water Monitoring	0	0	0	0	0	0	0	0	62	62	780
0505 Air Monitoring Data	0	0	0	0	0	0	0	0	44	44	583
Subtotal Task 05	17	0	17	31	0	31	31	0	228	197	2,709
Task 06 - Demography, Food Consumption & Agriculture											
0601 Tech Planning/Control/Rep	0	0	0	0	0	0	7	7	38	38	408
0602 Food Consumpion	4	1	5	7	2	9	15	6	49	40	403
0603 Milk/Other Food Model Dev	18	0	18	40	0	40	15	-25	93	53	320
0605 Native American Data	2	0	2	4	1	5	56	51	210	205	411
Subtotal Task 06	24	1	25	51	3	54	93	39	390	336	1,542

Table A.1. Cost Summary (Dollars in Thousands) (contd)

	November 1992			FY 1993 to Date (October 1992 - September 1993)							
	Labor $	Non-Labor $ (a)	Total $	Labor $	Non-Labor $ (a)	Total $	Cum Planned (b)	Cum Variance	CDC/TSP Approved FY Budget (c)	Funds Remaining	Budgeted FY Labor Hours
Task 07 - Environmental Pathways & Dose Estimates											
0701 Tech Planning/Control/Rep	4	0	4	13	0	13	9	-4	54	41	508
0702 Path & Dose Code Dev/Doc	0	1	1	0	1	1	15	14	94	93	1,061
0703 Path & Dose Model Paramet	6	0	6	9	0	9	9	0	58	49	657
0705 Dose Calculations	0	0	0	0	0	0	21	21	138	138	1,424
Subtotal Task 07	10	1	11	22	1	23	54	31	344	321	3,650
Task 08 - Statistics											
0801 Tech Planning/Control/Rep	2	0	2	4	0	4	7	3	51	47	373
0802 Stats Support for Tech Work	6	0	6	10	0	10	16	6	95	85	837
0803 Analysis of Model Reliability	31	0	31	50	0	50	31	-19	203	153	1,991
Subtotal Task 08	39	0	39	64	0	64	54	-10	349	285	3,201
Task 09 - Records Management											
0901 Tech Planning/Control/Rep	1	0	1	2	0	2	1	-1	5	3	90
0902 Project Records Management	3	1	4	6	1	7	12	5	69	62	1,480
Subtotal for Task 09	4	1	5	8	1	9	13	4	74	65	1,570
Task 10 - Quality Assurance											
1001 Tech Planning/Control/Rep	3	0	3	5	0	5	2	-3	13	8	121
1002 QA Program Development	1	0	1	1	0	1	2	1	14	13	169
1003 QA Verification	8	0	8	11	0	11	7	-4	42	31	524
Subtotal Task 10	12	0	12	17	0	17	11	-6	69	52	814

Table A.1. Cost Summary (Dollars in Thousands) (contd)

	November 1992			FY 1993 to Date (October 1992 - September 1993)							
	Labor $	Non-Labor $ (a)	Total $	Labor $	Non-Labor $ (a)	Total $	Cum Planned (b)	Cum Variance	CDC/TSP Approved FY Budget (c)	Funds Remaining	Budgeted FY Labor Hours
Task 11 - Information Resources											
1101 Tech Planning/Control/Rep	2	0	2	2	0	2	8	6	56	54	1,314
1102 Hanford Document Declass	8	1	9	8	1	9	17	8	103	94	1,683
1103 Hanford Info Resources Iden	5	0	5	7	0	7	5	-2	28	21	120
Subtotal Task 11	15	1	16	17	1	18	30	12	187	169	3,117
Task 12 - TSP Communications Support											
1201 Tech Planning/Control/Rep	2	3	5	4	3	7	3	-4	13	6	146
1203 Comm Assessment Research	0	0	0	0	0	0	2	2	11	11	192
1204 TSP Meeting/Material Sup	0	0	0	1	0	1	3	2	17	16	269
Subtotal - Task 12	2	3	5	5	3	8	8	0	41	33	607
Subtotal, HEDR Project Tasks	**322**	**27**	**349**	**497**	**37**	**534**	**675**	**141**	**4,095**	**3,561**	**42,823**

Table A.1. Cost Summary (Dollars in Thousands) (contd)

	November 1992			FY 1993 to Date (October 1992 - September 1993)							
	Labor $	Non-Labor $ (a)	Total $	Labor $	Non-Labor $ (a)	Total $	Cum Planned (b)	Cum Variance	CDC/TSP Approved FY Budget (c)	Funds Remaining	Budgeted FY Labor Hours
Technical Steering Panel (e)	0	0	0	0	0	0	42	42	63	63	0
Native American Research (f)	0	0	0	0	1	1	88	87	176	175	0
TOTAL	**322**	**27**	**349**	**497**	**38**	**535**	**805**	**270**	**4,334**	**3,799**	**42,823**

(a) Non-labor dollars include expenses such as travel, publication production, procurements, and subcontracts.
(b) The monthly planned amounts are given in the cost section of Figures 2, A.2, and A.3.
(c) "CDC/TSP Approved FY Budget" is the FY 1993 budget approved in the CDC contract plus carryover from FY 1992.
(d) Project management includes activities such as project control and administration, project communications, subcontract administration, records control, and peer review.
(e) The FY 1993 Technical Steering Panel budget is carryover from FY 1992 and will be used to complete the closeout of the TSP subcontracts. The FY 1993 TSP subcontracts are being administered by the State of Washington and that budget is not reflected here.
(f) The FY 1993 Native American Research budget is carryover from FY 1992 and will be used to complete the FY 1992 scopes of work. The FY 1993 contracts for Native American Research will be administered by the CDC and that budget is not reflected here.

1. ID (Contract) Number:	2. Program/Project Title:	3. Reporting Period:
DE-AC06-76RLO 1830	HANFORD ENVIRONMENTAL DOSE RECONSTRUCTION - TSP	November 1992

4a. Participant Name and Adress	4b. Client Name and Address	5. Start Date / 6. Completion Date
Pacific Northwest Laboratory P.O. Box 999 Richland, WA 99352	RL Richland, Washington 99352	5. Start Date October 1992 6. Completion Date September 1993

7. FY 93 | 8. Months

9. Cost Status

a. $ Expressed in: Thousands

b. B&R No./ Subaccount No.
12578
HR0120

c. FIN No.

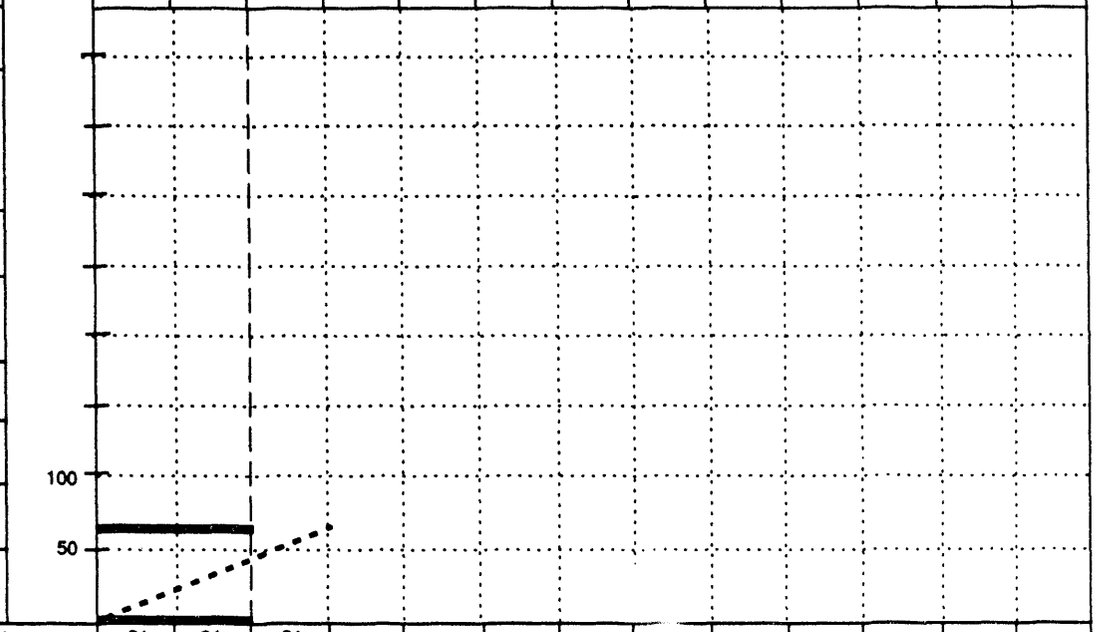
d. Actual Costs Prior Years
3052

e. FY Budget
63 (a)

f. Total Budget

g. FY Funds Auth.
63

h. Total Funds Auth.
3,115 (b)



		O	N	D	J	F	M	A	M	J	J	A	S	FY94
Costs	i. Planned	21	21	21										
	j. Actual (c)	0	0											
	k. Variance	21	21											
	l. Cum Planned	21	42	63										
	m. Cum Actual (c)	0	0											
	n. Cum Variance	21	42											

10. Legend: Planned - - - - - Actual ——— Funds Auth. ▬▬ 90% Funds Spent ⚑ Time Now

(a) "FY Budget" equals TSP FY 1992 carryover. These funds will be used to close out TSP subcontracts as final invoices are received. The FY 1993 budget is administered through the State of Washington and is not reflected here. (b) FY 1988-1993.
(c) Actual costs are recorded after invoices are received and processed. Therefore, current month costs may not reflect actual work performed.

11. Name of Project Manager
D. B. SHIPLER

Figure A.2. Technical Steering Panel Budget Status

1. ID (Contract) Number:	2. Program/Project Title:	3. Reporting Period:
DE-AC06-76RLO 1830	HANFORD ENVIRONMENTAL DOSE RECONSTRUCTION - TRIBES	November 1992

4a. Participant Name and Adress	4b. Client Name and Address	5. Start Date / 6. Completion Date
Pacific Northwest Laboratory P.O. Box 999 Richland, WA 99352	RL Richland, Washington 99352	5. Start Date October 1992 6. Completion Date September 1993

7. FY 93 | 8. Months

9. Cost Status

a. $ Expressed in: Thousands

b. B&R No./ Subaccount No.
12578
HR0120

c. FIN No.

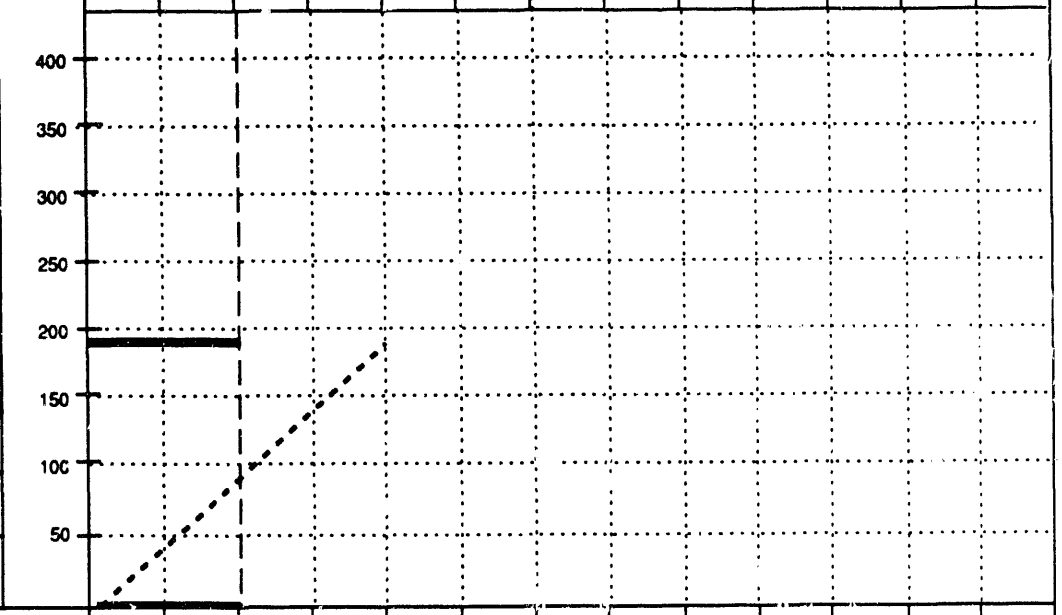
d. Actual Costs Prior Years
65 (a)

e. FY Budget
176 (b)

f. Total Budget

g. FY Funds Auth.
176

h. Total Funds Auth.
241 (c)



Costs	O	N	D	J	F	M	A	M	J	J	A	S	FY93
i. Planned	44	44	44	44									
j. Actual (d)	1	0											
k. Variance	43	44											
l. Cum Planned	44	88	132	176									
m. Cum Actual (d)	1	1											
n. Cum Variance	43	87											

10. Legend: Planned - - - - - Actual ——— Funds Auth. ▬▬ 90% Funds Spent ▷ Time Now

(a) "Actual Costs" for FY 1991 and prior fiscal years are part of the costs shown in Figure 2, HEDR Project Budget Status. At the direction of the TSP, Battelle began tracking Native American research costs separately in FY 1992. (b) "FY Budget" equals Native American Research FY 1992 carryover. These funds will be used to complete scopes of work currently authorized. The FY 1993 budget and contracts will be administered through the Centers for Disease Control and is not reflected here. (c) FY 1991 carryover plus FY 1992 funds. (d) Actual costs are recorded after invoices are received and processed. Therefore, current month costs may not reflect actual work performed.

11. Name of Project Manager
D. B. SHIPLER

Figure A.3. Native American Research Budget Status

Appendix B

Hanford-Site-Originated Documents of Potential Interest/Use to the HEDR Project - Placed in the RL Public Reading Room During November 1992

Appendix B

Hanford-Site-Originated Documents of Potential Interest/Use to the HEDR Project - Placed in the RL Public Reading Room During November 1992

HW-7-5243	Columbia River Temperature Study at 100-F Area. 4 p.	10/22/46
HW-24567	Synoptic Meteorology Manual of Standard Practices. 350 p.	03/22/54
HW-33533-RD	Achievements In HAPO Radiation Monitoring 1944-1954. 23 p.	09/15/54
HW-59644	REDOX In-Line Monitoring Instruments Information Manual. 20 p.	03/25/59
HW-64555-DEL	IPD Monthly Report March 1960. 104 p.	04/21/60
HW-65733-RD	Waste Disposal Criteria Existing Reactor Expansion Study. 11 p.	11/17/59
HW-67252-DEL	Chemical Processing Department Monthly Report for October 1960. 52 p.	11/21/60
HW-67286-DEL	IPD Monthly Report October 1960. 82 p.	11/14/60
HW-67459-DEL	Chemical Processing Department Monthly Report for November 1960. 52 p.	12/21/60
HW-67985	Chemical Processing Department Monthly Report December 1960. 49 p.	01/20/61
HW-68700-DEL	Chemical Processing Department Monthly Report for February 1961. 52 p.	03/21/61
HW-68718-DEL	IPD Monthly Report February 1961. 80 p.	03/15/61
HW-70658-DEL	Hanford Laboratories Operation Monthly Activities Report July 1961. 175 p.	08/15/61

HW-71187-DEL	Chemical Processing Department Monthly Report September 1961. 46 p.	10/20/61
HW-72154-DEL	Chemical Processing Departmen Monthly Report for December 1961. 43 p.	01/22/62
HW-76156	Proposed Redox Sand Filter Monitor and Stack Monitors. 17 p.	01/15/63
HW-77045	IPD Monthly Report March 1963. 61 p.	04/12/63
HW-77138	Chemical Processing Department Monthly Report for March 1963. 46 p.	04/22/63
HW-77139	N-Reactor Department Monthly Report March 1963. 45 p.	04/08/63
HW-77483	N-Reactor Department Monthly Report April 1963. 49 p.	05/07/63
HW-77499	IPD Monthly Report April 1963. 64 p.	05/13/63
HW-77504	Chemical Processing Department Monthly Report for April 1963. 43 p.	05/21/63
HW-77749	IPD Monthly Report May 1963. 68 p.	06/14/63
HW-77795	Chemical Processing Department Monthly Report for May 1963. 46 p.	06/21/63
HW-78029	IPD Monthly Report June 1963. 65 p.	07/15/63
HW-78052	Hanford Laboratories Monthly Activities Report June 1963. 205 p.	07/15/63
HW-78076	Chemical Processing Department Monthly Report June 1963. 42 p.	07/22/63
HW-78420	Hanford Laboratories Monthly Activities Report July 1963. 207 p.	08/15/63
HW-78484	Chemical Processing Departmen Monthly Report July 1963. 44 p.	08/22/63
HW-78758	Hanford Laboratories Monthly Activities Report August 1963. 198 p.	09/16/63

HW-78780	IPD Monthly Report August 1963. 59 p.	09/13/63
HW-78817	Chemical Processing Department Monthly Report for August 1963. 43 p.	09/20/63
HW-79046	Hanford Laboratories Monthly Activities Report September 1963. 204 p.	10/15/63
HW-79097	Chemical Processing Department Monthly Report for September 1963. 43 p.	10/21/63
HW-79070	IPD Monthly Report September 1963. 66 p.	10/14/63
HW-79107-DEL	N-Reactor Monthly Report September 1963. 43 p.	10/07/63
HW-79377	Hanford Laboratories Monthly Activities Report October 1963. 212 p.	11/15/63
HW-79448-DEL	N-Reactor Department Monthly Report October 1963. 46 p.	11/07/63
HW-79480	Chemical Processing Department Monthly Report October 1963. 45 p.	11/21/63
HW-79726	Hanford Laboratories Monthly Activities Report November 1963. 210 p.	12/16/63
HW-79768	Chemical Processing Department Monthly Report for November 1963. 43 p.	12/20/63
HW-79999	Hanford Laboratories Monthly Activities Report December 1963. 189 p.	01/15/64
HW-80171	IPD Monthly Report December 1963. 61 p.	01/14/64
HW-80243	Chemical Processing Department Monthly Report for December 1963. 45 p.	01/22/64
HW-80559-1-DEL	N-Reactor Department Monthly Report January 1964. 44 p.	02/07/64
HW-80559-10-DEL	N-Reactor Department Monthly Report October 1964. 46 p.	11/10/64
HW-80559-6-DEL	N-Reactor Department Monthly Report June 1964. 57 p.	07/07/64

HW-80559-8-DEL	N-Reactor Department Monthly Report August 1964. 64 p.	09/08/64
HW-83000	Hanford Laboratories Monthly Activities Report June 1964. 166 p.	07/15/64
ISO-089-DE	Chemical Processing Division Monthly Report for January 1966. 46 p.	02/21/66
ISO-143-DEL	Chemical Processing Department Monthly Report for February 1966. 44 p.	03/21/66
ISO-210-DEL	Chemical Processing Division Monthly Report for March 1966. 44 p.	04/22/66
ISO-276-DEL	Chemical Processing Division Monthly Report for April 1966. 48 p.	03/20/66
ISO-315-DEL	Chemical Processing Department Monthly Report May 1966. 45 p.	06/20/66
ISO-365-DEL	Chemical Processing Department Monthly Report for June 1966. 49 p.	07/21/66
ISO-428-DEL	Chemical Processing Department Monthly Report for July 1966. 37 p.	08/22/66
ISO-476-DEL	Chemical Processing Departmen Monthly Report for August 1966. 39 p.	09/21/66
ISO-512-DEL	Chemical Processing Department Monthly Report for September 1966. 46 p.	10/21/66
ISO-563-DEL	Chemical Processing Division Monthly Report for October 1966. 48 p.	11/21/66
ISO-610-DEL	Chemical Processing Division Monthly Report for November 1966. 45 p.	12/21/66
ISO-642-DEL	Chemical Processing Division Monthly Report for December 1966. 46 p.	01/20/67
ISO-707-DEL	Chemical Processing Division Monthly Report for January 1967. 51 p.	02/20/67

ISO-708-DEL	Chemical Processing Department Monthly Report for February 1967. 47 p.	03/20/67
ISO-709-DEL	Chemical Processing Department Monthly Report for March 1967. 44 p.	04/20/67
ISO-710-DEL	Chemical Processing Division Monthly Report for April 1967. 46 p.	05/22/67
ISO-711-DEL	Chemical Processing Division Monthly Report for May 1967. 46 p.	06/20/67
ISO-712	Chemical Processing Departmen Monthly Report for June 1967. 48 p.	07/20/67
ISO-713-DEL	Chemical Processing Division Monthly Report for July 1967. 43 p.	08/21/67
ISO-714-DEL	Chemical Processing Division Monthly Report for August 1967. 44 p.	09/21/67
PNL-7423 HEDR	Initial Communications Survey Results for the HEDR Project. 19 p.	03/31/91
PNL-7558	Field Lysimeter Test Facility: Protective Barrier Test Results (FY 1990 the Third Year). 116 p.	11/30/90
PNL-7563 HEDR-REV1	FY 1991 Task Plans for the Hedr Project. 105 p.	04/30/91
PNL-7931 HEDR	Letter Report: Population Estimates By Age, Sex and Race for 10-county Study Area. 299 p.	02/29/92
PNWD-1980-04 HEDR	Hanford Environmental Dose Reconstruction Project Monthly Report September 1992. 50 p.	08/31/92
PNWD-2033 HEDR-V1	Iodine-131 Releases from the Hanford Site 1944 Through 1947. 110 p.	10/26/92
PNWD-2033 HEDR-V2	Iodine-131 Releases from the Hanford Site 1944 Through 1947. 230 p.	10/22/92
PNWD-2047 HEDR	Status of Document Search and Data Quality Objective Efforts. 17 p.	09/30/92

RL-SEP-282-DEL	Chemical Processing Department Monthly Report for January 1965. 41 p.	02/23/65
RL-SEP-332-DEL	Chemical Processing Department Monthly Report for February 1965. 39 p.	03/22/65
RL-SEP-405-DEL	Chemical Processing Department Monthly Report March 1965. 40 p.	04/22/65
RL-SEP-476-DEL	Chemical Processing Department Monthly Report for April 1965. 41 p.	05/21/65
RL-SEP-509-DEL	Chemical Processing Department Monthly Report for May 1965. 43 p.	06/21/65
RL-SEP-618-DEL	Chemical Processing Department Monthly Report for June 1965. 44 p.	07/21/65
RL-SEP-654-DEL	Chemical Processing Department Monthly Report for July 1965. 40 p.	08/23/65
RL-SEP-706-DEL	Chemical Processing Department Monthly Report for August 196. 41 p.	09/21/65
RL-SEP-755-DEL	Chemical Processing Department Monthly Report for September 1965. 41 p.	10/22/65
RL-SEP-837-DEL	Chemical Processing Department Monthly Report for October 1965. 38 p.	11/22/65
RL-SEP-874-DEL	Chemical Processing Department Monthly Report for November 1965. 44 p.	12/22/65
RL-SEP-913-DEL	Chemical Processing Department Monthly Report for December 1965. 38 p.	01/21/66
UNI-2620	N Reactor Thermal Plume Characterization Study During Dual-purpose Mode of Operation. 232 p.	09/30/83

Appendix C

HEDR Documents to the TSP - November 1992

A complete listing appears in the September monthly reports.

Appendix C

HEDR Documents to the TSP - November 1992

Title	Author	Date Issued	Publication No	Additional Information	Status
Literature and Data Review for the Surface-Water Pathway: Columbia River and Adjacent Coastal Areas	WH Walters RL Dirkes BA Napier	11/92	PNWD-2034 HEDR	Milestone 0404A	Published Final

Appendix D

HEDR Presentation Handouts to the TSP - November 1992

A complete listing appears in the September monthly reports.

Appendix D

HEDR Presentation Handouts to the TSP - November 1992

Title	Author	Date Issued	Publication No	Additional Information
Preliminary Investigation of Source of Uncertainty in HEDRIC	JV Ramsdell	11/92	BN-SA-3644 S HEDR	Presented at TSP meeting, October 8-10, 1992, Pasco, WA
Introduction to the RATCHET Computer Code	JV Ramsdell	11/92	BN-SA-3645 S HEDR	Presented at RATCHET Program Review meeting, October 21, 1992, Atlanta, GA

Appendix E

HEDR Open-Literature Publications and Presentations - November 1992

This appendix lists publications that present aspects of dose reconstruction in the open scientific literature. TSP approval is not required. A complete listing appears in the September monthly reports.

Appendix E

HEDR Open-Literature Publications and Presentations - October 1992

Title	Author	Date Issued	Publication No.	Audience	Status
Status of HEDR Project Work	DB Shipler	10/92	Seminar	Westinghouse Hanford Company	Presented Oct. 28, 1992, Richland, WA
Evaluating Historical Scans of Worker Thyroids for Environmental Dose Reconstruction	TA Ikenberry	11/92	BN-SA-3609 S HEDR	38th Annual Conference on Bioassay, Analytical and Environmental Radiochemistry	Presented Nov. 2-6, 1992, Santa Fe, NM
Data Quality Objectives for Retrospective Studies	DB Shipler et al.	11/92	BN-SA-3635 S HEDR	13th Annual Meeting, Society of Environmental Toxicology and Chemistry	Presented Nov. 8-12, 1992, Cincinnati, OH
Environmental Accumulation of Radionuclides Released to the Atmosphere	DB Shipler BA Napier TA Ikenberry	11/92	BN-SA-3637 S HEDR	13th Annual Meeting, Society of Environmental Toxicology and Chemistry	Presented Nov. 8-12, 1992, Cincinnati, OH