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**PROJECT MANAGEMENT PLAN
FOR THE HANFORD ENVIRONMENTAL
DOSE RECONSTRUCTION PROJECT**

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September 1992


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ENVIRONMENTAL DOSE RECONSTRUCTION PROJECT**

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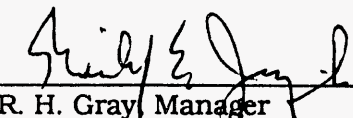
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9/9/92
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9-11-92
Date



for R. H. Gray, Manager
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9/9/92
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PREFACE

This document is an updated version of the original plan dated March 1992. Changes from the March 1992 version are shown in italics.

The document number for the March 1992 version was PNL-7870 HEDR; the current (September 1992) version is numbered as PNWD-2021 HEDR. The report numbering system changed from the "PNL" designator (when Battelle's HEDR work was under contract to the U.S. Department of Energy) to the "PNWD" designator in June 1992 (when the work came under contract to the Centers for Disease Control).

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1.0 INTRODUCTION

This Project Management Plan (PMP) describes the approach being used to manage the Hanford Environmental Dose Reconstruction (HEDR) Project. The plan describes the management structure and the technical and administrative control systems used to plan and control HEDR Project performance. The plan also describes the relationship among key project participants: Battelle, the Centers for Disease Control (CDC), and the Technical Steering Panel (TSP). Battelle's contract with CDC only extends through May 1994 when the key technical work will be completed. Therefore, this plan is focused only on the period during which Battelle is a participant.

The PMP includes the following sections:

- *Introduction* (Section 1.0). Summarizes the project's purpose, scope, and the role of project participants.
- *Planned Accomplishments* (Section 2.0). Addresses HEDR Project objectives, including technical, cost, and schedule objectives.
- *Management Systems and Controls Description* (Section 3.0). Depicts the project work scope elements, participants, and relationships established to achieve the project objectives.
- *Technical Systems and Controls* (Section 4.0). Documents the overall approach used in establishing and controlling project baselines and integrating the technical task plans and measurement techniques.
- *Administrative Systems and Controls* (Section 5.0). Documents technical support systems used in the planning and performance of work.

1.1 PROJECT BACKGROUND

The HEDR Project was prompted by mounting concern by the public about possible health effects from more than 40 years of

releases of radioactive materials from the Hanford Site. In 1986, the Hanford Health Effects Review Panel recommended that a dose reconstruction study be conducted. The study was begun in 1987. When completed in 1995, the project will provide dose estimates for the Hanford Thyroid Disease Study, specified populations, reference individuals, and actual individuals as well as a dose estimating capability (software and databases). At project completion, the dose estimate model will be transferred to another agency that can provide dose estimates for individuals and other dose-related data upon request.

1.2 PROJECT PURPOSE

The HEDR Project was established to develop estimates of radiation doses that populations and individuals could have received from releases of radioactive materials from the Hanford Site since 1944, with descriptions of the uncertainties inherent in such estimates.

1.3 ROLES AND RESPONSIBILITIES OF PROJECT PARTICIPANTS

Major project participants are shown in Figure 1.1. Beginning in June 1992, Battelle

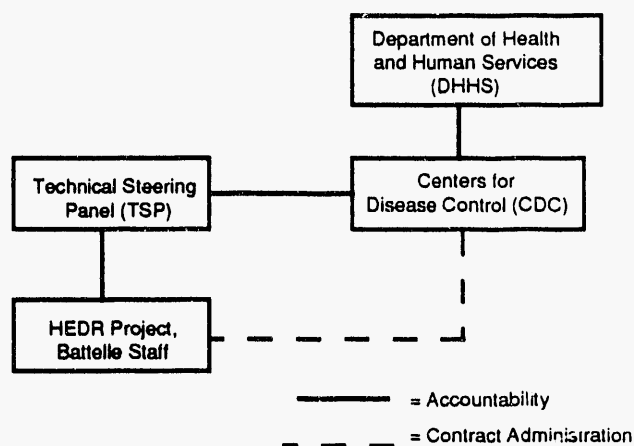


FIGURE 1.1. Major HEDR Project Participants

Pacific Northwest Laboratories staff conducted the work under contract to the CDC. The TSP is the Technical Director of work under the CDC contract and therefore continues to direct and approve the technical work. The CDC funds the project, ensures accountability, and provides contract administration. The CDC is an agency of the Public Health Service, which is part of the U.S. Department of Health and Human Services.

More detail on project participants is provided in Section 3.1, Organization.

1.4 ASSUMPTIONS AND CONDITIONS

Project planning is based on TSP Research Directive 90-1, "Project Direction," which

establishes a planning process, content of project plans, and a process for tracking and reporting project work.

Funding for Battelle is provided through the CDC contract. Funding for the TSP and Native Americans also is provided by CDC through separate contracting mechanisms.

The PMP will be updated as required, at least annually. Controlled copies of the PMP are kept by HEDR staff, the Battelle Records Center, the TSP and its staff, and the U.S. Department of Energy (DOE) Richland Field Office Public Reading Room. Updated portions of the PMP will be distributed through Battelle's Document Control Center.

2.0 PLANNED ACCOMPLISHMENTS

This section describes the technical, communications, schedule, cost, and financial objectives of the project. A project work breakdown structure (WBS) is provided in Appendix A. Appendix B contains the Project Summary Schedule and milestone descriptions for the period of the Battelle contract with CDC and beyond. Appendix C contains a time-phased budget at the task level for Fiscal Year (FY) 1992, FY 1993, and the first half of FY 1994. For planning purposes, fiscal years begin on October 1 of one year and end on September 30 of the following year.

2.1 TECHNICAL AND COMMUNICATIONS OBJECTIVES

The overall technical objective of the HEDR Project is to estimate radiation doses, and their uncertainties, to populations and individuals from past Hanford radionuclide releases. More detailed objectives, set by the TSP in February 1991, are as follows:

- demonstrate that sufficient historical information exists or can be reconstructed to enable a dose reconstruction study to be carried out
- reconstruct radionuclide release information—what was released, from where, how much, and when—from Hanford facilities, 1944-1990
- develop a maintainable dosimetry and information system that can be used to estimate radiation doses to special populations and to representative and actual individuals, given personal information such as age, locations, lifestyle, and dietary habits
- develop conceptual and computational models to specifically deal with uncertainties in the variables needed to estimate historical radiation doses to offsite populations
- estimate radiation doses that can be used by the Fred Hutchinson Cancer Research

Center in its Hanford Thyroid Disease Study and by other potential health studies

- support Native American tribal research, conducted by tribes, to acquire demographic, food consumption, and other dose input data
- perform quality and credible science
- support communications with the public.

Section 2.1.1 describes the work necessary to produce the products and services to meet these objectives.

2.1.1 Statement of Work

A summary-level WBS is shown as Figure 2.1; the full WBS is in Appendix A.

Tasks are developed in the organizational structure to address planned work of the WBS.

The following discussion summarizes each of the HEDR tasks.

- *Project Management (WBS 1.0)* - provides project planning, control, and management of Battelle dose reconstruction work in accordance with the CDC contract and TSP direction.
- *Technical Integration (WBS 2.0)* - provides 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 developing the project dose estimating capabilities and for performing the final dose calculations.
- *Source Terms (WBS 3.0)* - develops 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.

- *Atmospheric Transport (WBS 4.1)* - reconstructs the movement of radioactive materials (source term information) from areas of release through the atmosphere to other environmental media. The results of the analyses are concentrations in the air and deposits on the ground, which are used by pathways codes to generate estimates of concentrations in humans.

- *Ground-Water Transport (WBS 4.2)* - reconstructs the movement of radioactive materials from areas of release through the groundwater to other environmental media. This aspect of the project, done by summarizing the results of an extensive literature review, has been completed.

- *Columbia River Transport (WBS 4.3)* - reconstructs the movement of radioactive materials (source term information) from areas of release through the Columbia River to other environmental media. The results of the analyses are concentrations in water fish and shellfish, which are used by pathways codes to generate estimates of concentrations in humans.

- *Environmental Monitoring Data (WBS 5.0)* - assembles, evaluates, and summarizes key historical measurements of the concentrations of radionuclides in the environment around the Hanford Site. Measurements are of air, drinking water, foods, fish, the Columbia River, soil, vegetation, and other materials. 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 Atmospheric Transport and Columbia River Transport Tasks to calibrate computer models.

- *Demography, Food Consumption, and Agriculture (WBS 6.0)* - develops demographic, lifestyle, food consumption, and food production information needed to estimate radiation doses. Such information is developed for the general population and for special groups such as Native American tribes.

- *Environmental Pathways and Dose Estimates (WBS 7.0)* - uses calculated and measured concentrations of radionuclides provided

by the Atmospheric Transport Task, the Columbia River Transport Task, and the Environmental Monitoring Data Task to calculate radiation doses to populations, typical individuals, and specific individuals.

- *Statistics (WBS 8.0)* - provides statistical support to members of technical tasks. Task work also includes conducting sensitivity and uncertainty analyses, which are used to identify the most significant input parameters.

- *Records Management (WBS 9.0)* - stores and controls completed project records, maintains an automated inventory of all project documents, and provides a reference service to project staff and the TSP.

- *Quality Assurance (WBS 10.0)* - ensures continuous quality assurance (QA) support and coordination with all project tasks. Work includes developing a project QA plan and monitoring project activities to ensure compliance with the plan.

- *Information Resources (WBS 11.0)* - searches for, retrieves, declassifies as necessary, and distributes Hanford-originated documents of use to HEDR staff for dose reconstruction. Copies of information used and declassified are also made available to the public.

- *TSP Communications Support (WBS 12.0)* - assists the TSP in developing, implementing, and evaluating its public involvement program.

2.2 SCHEDULE OBJECTIVES

The Project Summary Schedule, in Appendix B, shows major work activities, milestones, and constraints for the project through its completion in 1995, though Battelle's contract with CDC currently runs only through May 1994. The schedule and its associated work scopes, etc., can be changed through contract modifications.

The integrated components of scope, cost, and schedule for approved task activities and

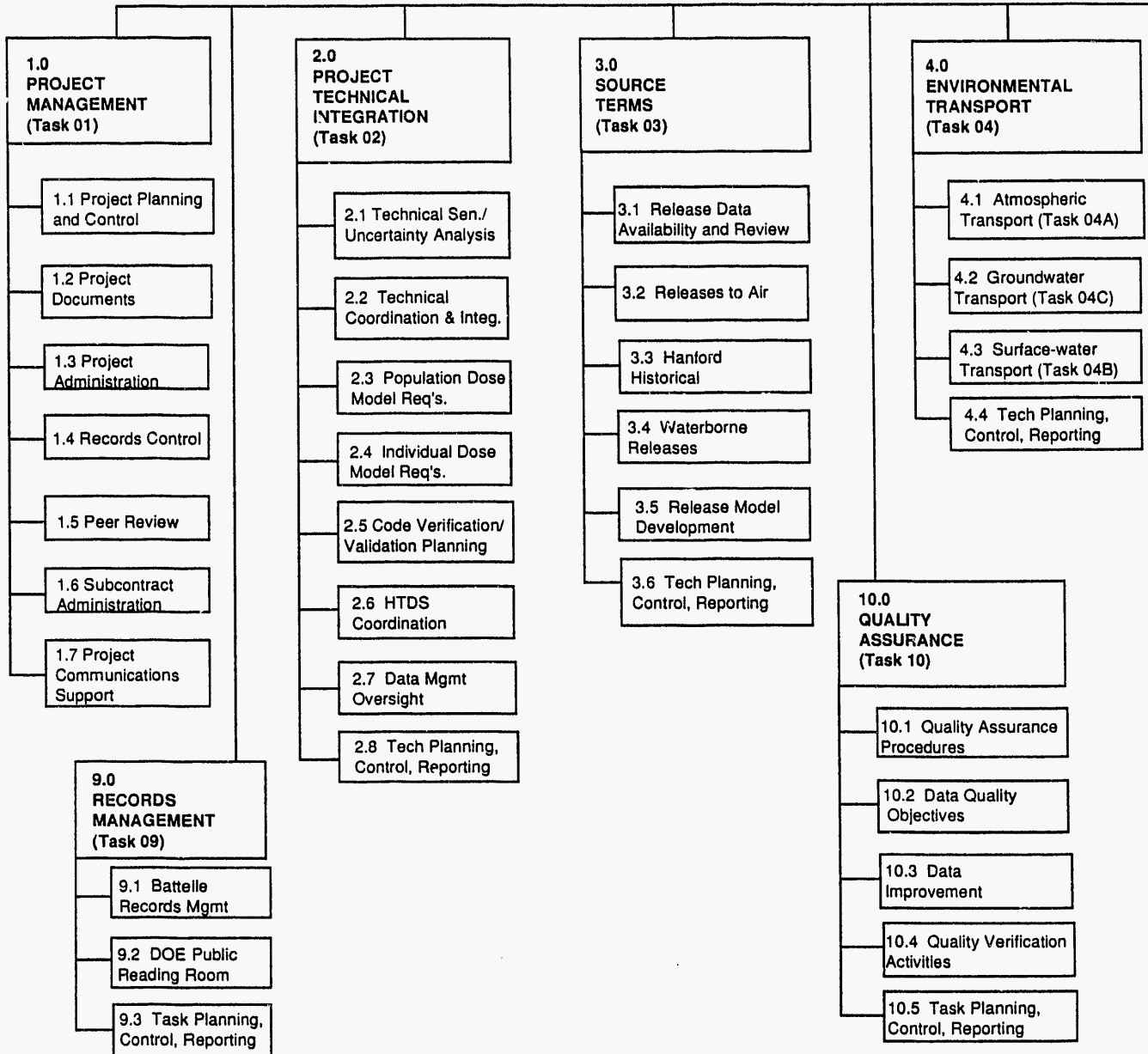
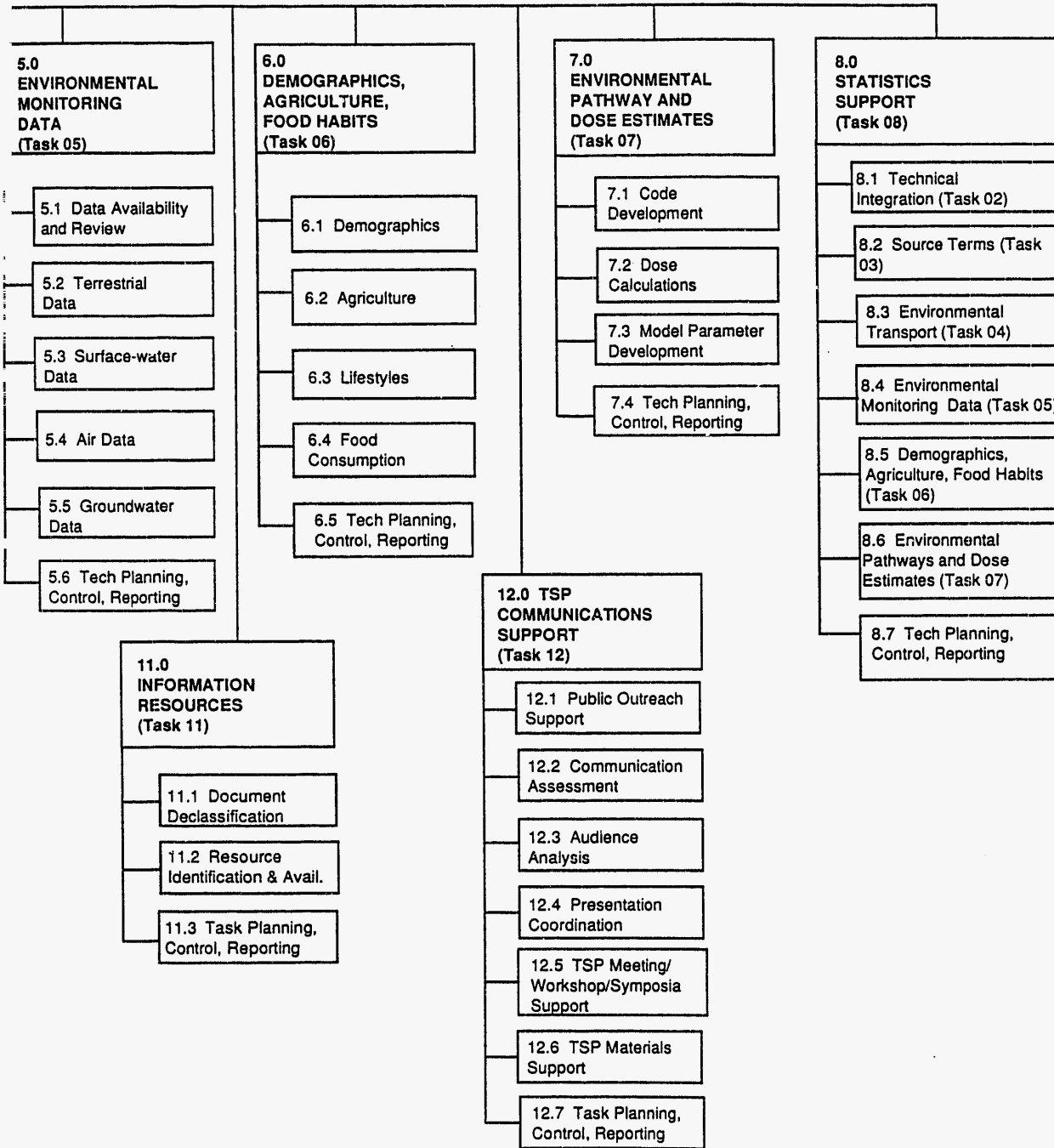


FIGURE 2.1 Summary-Level Work Breakdown Structure

**ENVIRONMENTAL
REDUCTION**



Breakdown Structure for the HEDR Project

budgets is maintained on computer. The schedule is controlled to provide a basis for reviews and detailed planning for out years. It is also used for evaluation of alternatives and the impacts of proposed decisions.

2.3 COST OBJECTIVES

The Battelle HEDR spend plan (budget) for FY 1992, 1993, and the first half of FY 1994 is contained in Appendix C. The budget for the first half of FY 1994 was negotiated as part of the Battelle/CDC contracting process. The budgets for the second half of FY 1994 and FY 1995 are outside of the Battelle contract and have not yet been developed by the TSP.

2.4 FINANCIAL OBJECTIVES

Since it began in 1987, the project was funded directly by the DOE. In December 1990, DOE and the Department of Health and Human Services (DHHS) entered into a Memorandum of Understanding whereby the DHHS assumed management of dose reconstruction projects related to DOE facilities. Within the DHHS, the CDC now has a sole-source contract with Battelle for the remaining HEDR technical work. The contract is a cost-plus-fixed-fee contract for 2 years. HEDR work is funded directly by CDC. DOE provides funds to CDC for Battelle's contract.

Total project cost through FY 1991 was \$13.1M. The TSP-approved project budget for FY 1992 is \$5.228M. Battelle has spent \$11.2M through FY 1991 and has an approved budget of \$4.11M for FY 1992, bringing Battelle's estimated cost to completion to \$20.877M. The spend plan for Battelle, through May 1994, is given in Appendix C.

2.4.1 Funds Management

DOE-EH 42 (DOE Headquarters) has provided \$3.472M through the 1992 FIN Plan to the U.S. DOE Richland Field Office (RL). RL has provided the funds to Battelle through the 1830 contract. The remaining DOE 1992 funds, \$1.35M, was transferred to the DHHS/CDC and provided to Battelle. The remaining \$50K was provided to Battelle by CDC. FY 1991 carry-over funds of \$356K completes the FY 1992 budget. Funding for FY 1993 and contracted portions of FY 1994 will be incrementally funded by CDC based on the contract and TSP-approved Task Plans. Spending of fiscal year funds will be reported in monthly reports to the TSP.

Beginning in FY 1993, Battelle will not be managing the TSP or Native American sub-contracts and will not be responsible for total project budgets. The Battelle budgets for FY 1993 and 1994 are \$3.918M and \$1.649M, respectively.

3.0 MANAGEMENT SYSTEMS AND CONTROLS DESCRIPTIONS

Project management systems will be used to plan and control work; establish technical, schedule, and cost plans; establish performance criteria; status actual performance against approved plans; control changes; and assign organizational accountability. The following sections describe the systems and processes used by Battelle to perform and control work and how Battelle interacts with the TSP and CDC to plan, report, and complete work.

3.1 ORGANIZATION

A project organization chart is shown in Figure 3.1. Responsibilities of key individuals are shown in Table 3.1.

Battelle has provided all subcontracting for the project to date. Subcontracts have been provided for the TSP, TSP staff support, TSP communications support, meetings and research by Native American tribes, and Battelle technical support. The types of subcontracts used include workshop agreements, inter-laboratory agreements, research agreements, negotiated scope and cost contracts, and indefinite-quantity contracts. The numbers of each type of contract normally placed each year have been approximately the following:

- negotiated scope contracts (30) - where the statement of work is negotiated
- inter laboratory agreements (3) - where work is arranged with another Battelle component, such as the Battelle Seattle Research Center
- indefinite-quantity contracts (4) - where work orders are issued as services are known; the total number of hours required is not known. Can be sole source or competitive bid.
- research agreements (3) - to conduct research for a Battelle-specified scope of work, e.g., a university would develop historical agricultural information for use in dose estimates.

- workshop agreements (60) - where travel and living expenses, and sometimes a fee, are paid to an individual for attending/presenting at seminars or workshops.

Subcontracts for the TSP, TSP staff support, TSP communications support, and Native American tribes (meetings and research) will not be managed by Battelle under its contract with CDC. Battelle will subcontract only for support necessary to meet its technical needs.

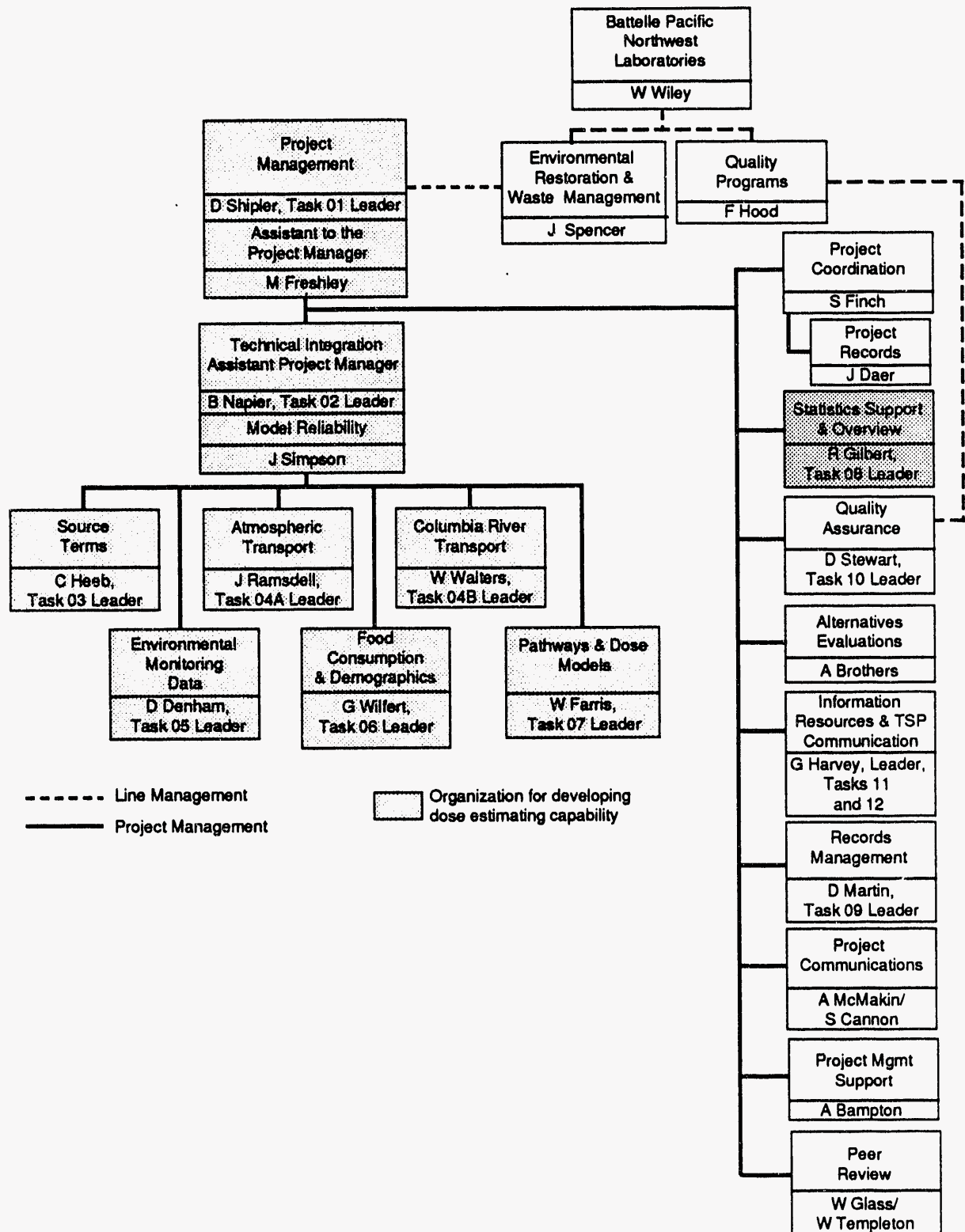
3.2 PLANNING AND BUDGETING

3.2.1 Work Authorization and Control

Work scopes, technical approaches, quality objectives, milestones, deliverables, and estimated costs are developed with the TSP and approved by the TSP and CDC as fiscal year Task Plans. The FY 1992, 1993, and 1994 Task Plans for the contract period have been combined into a single plan.

Task Leaders, as shown in Figure 3.1, are responsible for evaluating their task/subtask plans and determining the most effective way to authorize and track specific scopes and technical approaches of the work. This evaluation results in defining financial work packages and allocating the budget for reporting and tracking. These proposed work packages are reviewed for feasibility of implementation by the Project Coordinator (see "Project Coordination" box in Figure 3.1) and approved by the Project Manager.

The Project Coordinator assigns numbers to the work packages, issues the numbers to the Task Leaders, provides the numbers to Battelle Finance, and requests financial reports from Battelle Cost Accounting. Task Leaders and the Project Office receive biweekly cost reports and monthly reports that compare actual versus budgeted costs. These reports are reviewed and tracked by the Task Leaders



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FIGURE 3.1. HEDR Project Organization

TABLE 3.1. Responsibility, Accountability and Authority Matrix

Organization/Staff	CDC Contract	ENW Sub-contract	Task Plan	Tech Reports	Procedures	QA Plan	Proj Mgmt Plan	Info Clearance	Sub-contract Invoices	Equip and Supplies	Records Mgmt	Data Mgmt	Peer Review	Code Specs
CDC Management	A	N	C	C	N	R	C	N	N	N	C	C	N	C
TSP Chair	R	N	A	A	R	R	C	N	N	N	N	C	N	A
TSP Subcommittee Chairs	R	N	R	R	R	R	R	N	N	N	N	N	N	R
HEDR Project Manager	C	R/C	A	A	A	A	A	A	R/A	A	A	A	A	A
HEDR Ass't Project Mgr	R	N	R/C	R/C	R/C	R/C	R/C	N	N	N	N	P	N	P/R
HEDR Ass't to the Project Mgr	R	N	R	R	P/R	R	R	N	N	N	R	R	R	R
HEDR Publications Mgr	N	N	P/R	P/R	P/R	R	P/R	R/C	N	N	R	P/R	R	P/R
HEDR Project Coordinator	R	R/C	P/R	P/R	P/R	R	P/R	P/R	R/A	P/R	R/C	R	R	N
HEDR Task Leaders	N	P/C	P/R/C	P/R/C	R	R	R	C	R/A	P/C	R	R/C	R	R/C
HEDR Communications Spec.	N	N	P/R	P/R	P/R	R	P/R	R/C	N	N	N	R	R	R
HEDR Subtask Leaders	N	N	P/R	P/R	R	R	R	R/C	N	P	R	R	R	R
ENW Contracts	P/R/A	C	C	N	N	N	R	N	N	N	N	N	N	N
ENW Subcontracts	R	A	N	N	N	N	R	N	R/A	N	N	N	N	N
ENW Accounts Payable	N	N	N	N	N	N	N	N	R/A	N	N	N	N	N
ENW Purchasing	R	N	N	N	N	N	N	N	N	R/A	N	N	N	N
HEDR Records Manager	R/C	R/C	R/C	N	R/A	R	R	N	N	N	A	R	N	N
ENW QA	R	N	N	N	N	A	N	N	N	N	N	N	N	N
HEDR QA Representative	R/C	R/C	R/C	R/C	P/R/A	P	R/C	C	N	R/C	R/C	R/C	R/C	R/C
ENW Line Management ^(a)	R	N	R/C	R/C	R	R/C	R/C	A	N	A	N	N	C/A	R
ENW Finance	P/R/C	R/C	N	N	N	N	N	N	N	A	N	N	N	N

Key

- P - Prepare
- R - Review
- C - Concur
- A - Approve
- N - Not Applicable

(a) Table 5.1 shows organizations within Battelle to which Battelle HEDR staff belong.

and reviewed with the Project Coordinator and Project Manager as part of internal, monthly HEDR team meetings.

In addition to the task plans, other HEDR planning documents describe how work is conducted. These documents are described in Section 4.3. Work authority is shown in Figure 3.2. The process for authorizing Battelle to conduct HEDR work is as follows.

Planning the Work (Steps 1 through 8 in Figure 3.2)

The CDC ensures accountability and provides contract administration for HEDR work in accordance with the DOE/DHHS Memorandum of Understanding, CDC policies and procedures, and the CDC/Battelle contract. The TSP defines the scope of work, deliverable items, and work schedule in writing to Battelle. Battelle develops detailed task plans based on the TSP guidance. The task plans define the scope, deliverables, and schedule in more detail and include technical approach, quality assurance considerations, and staff organization of specific activities. The TSP and the CDC review and comment on the task plans, and Battelle revises them accordingly. The revised plans are reviewed by the TSP and the CDC, approved by the TSP, and concurred with by the CDC.

Authorizing the Work (Steps 7 through 10 in Figure 3.2)

The TSP authorizes the technical work to proceed by signing approved task plans. The CDC orders the work to proceed through the Battelle contract. The Battelle Project Manager authorizes HEDR staff to proceed with the work by authorization of funds through work packages.

Reviewing and Approving Changes to Work (Steps 11 and 12 in Figure 3.2)

Once the approved work is under way, the TSP may modify technical emphasis or deliverables within the scope, schedule, or deliverables of the Battelle contract. Any changes to the conditions of the contract are proposed to

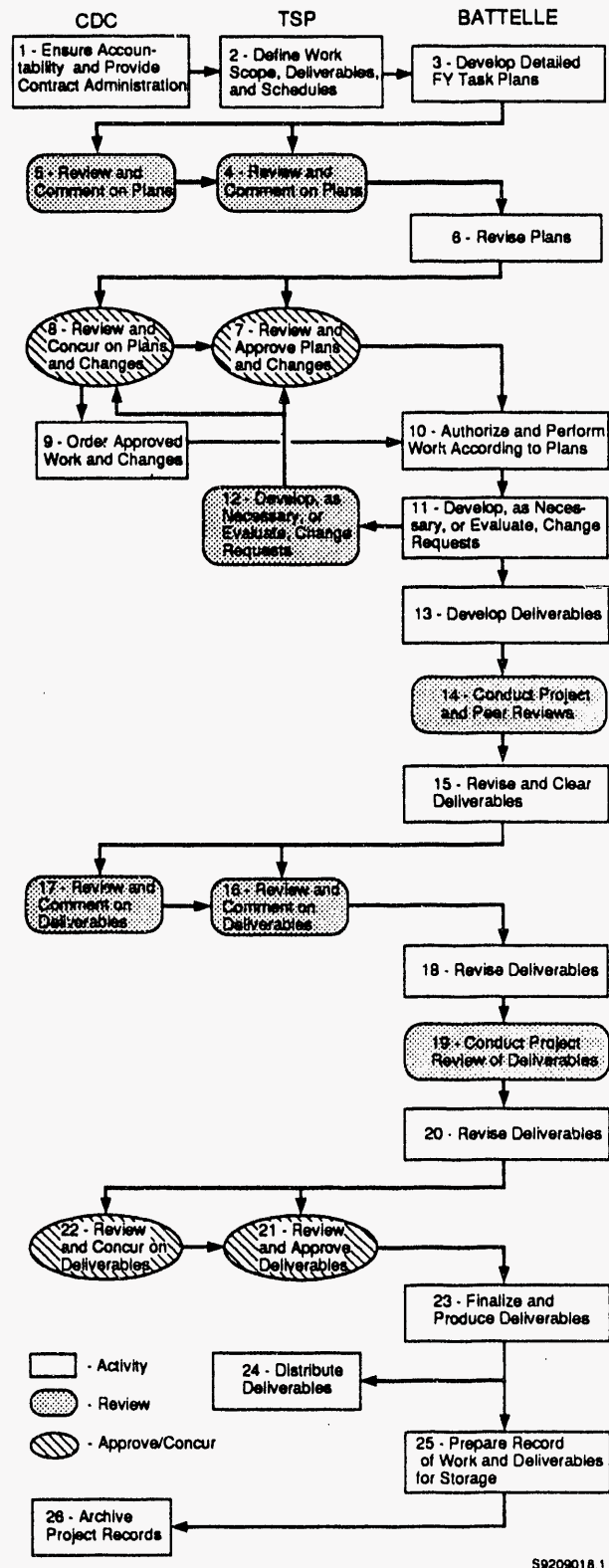


FIGURE 3.2. Process for Planning, Authorizing, and Completing HEDR Work

the TSP by Battelle through written change requests (see form in Appendix E). The TSP evaluates and approves or disapproves Class 1 change requests (see Section 4.1.1). The CDC reviews and concurs with the TSP's action and modifies the Battelle contract, as appropriate.

Performing and Delivering the Work (Steps 13 - 24 in Figure 3.2)

As approved work continues, Battelle generates deliverable items to the TSP and CDC as agreed to in the task plans and contract. Before a deliverable goes to the TSP and CDC (and is made publicly available), Battelle conducts project and peer reviews of it, then revises it to respond to review comments. The deliverable is then cleared within Battelle as an initial version. The TSP and CDC review and comment on the deliverable, which is also made publicly available at this point. Battelle revises the deliverable to respond to TSP and CDC comments. The revised deliverable is reviewed by the TSP and CDC, approved by the TSP and concurred with by the CDC. The document is finalized, published, and distributed to the TSP.

Creating and Archiving Project Records (Steps 25 and 26 Figure 3.2)

Records of project work that document as deliverables are prepared for storage and archived according to Battelle's contract and HEDR procedures.

3.2.2 Performance Measurement and Reporting

Project performance (technical, cost, and schedule) is measured at the end of each month and reported in the HEDR monthly report. Each task reports progress and work status as shown in Appendix D.

Cost performance is reported as shown in Figure 3.3. This graph is filled in with the appropriate costs (monthly and cumulative) and appears in each HEDR monthly report.

Project performance is measured as percent complete by comparing costs (planned versus actual) and schedule (milestone) to the scope of work. Monthly reports show *cumulative* variances that are 15% or \$25,000 over or under the budgeted cumulative amount, whichever is smaller. Monthly reports from Task Leaders to the Project Manager also include a discussion of *monthly* variances of 10% or \$5,000, whichever is smaller.

Part of monthly reporting is the detailed analysis of real or potential variances and corrective action planning to prevent the variance or get the activity back on schedule.

3.2.3 Contingency

Contingency funds for Battelle work are not budgeted.

3.3 REPORTING

Following contractual requirements, Battelle will provide monthly reports of technical work to the TSP and CDC by the 20th of each following month. Quarterly financial reports will be provided to CDC.

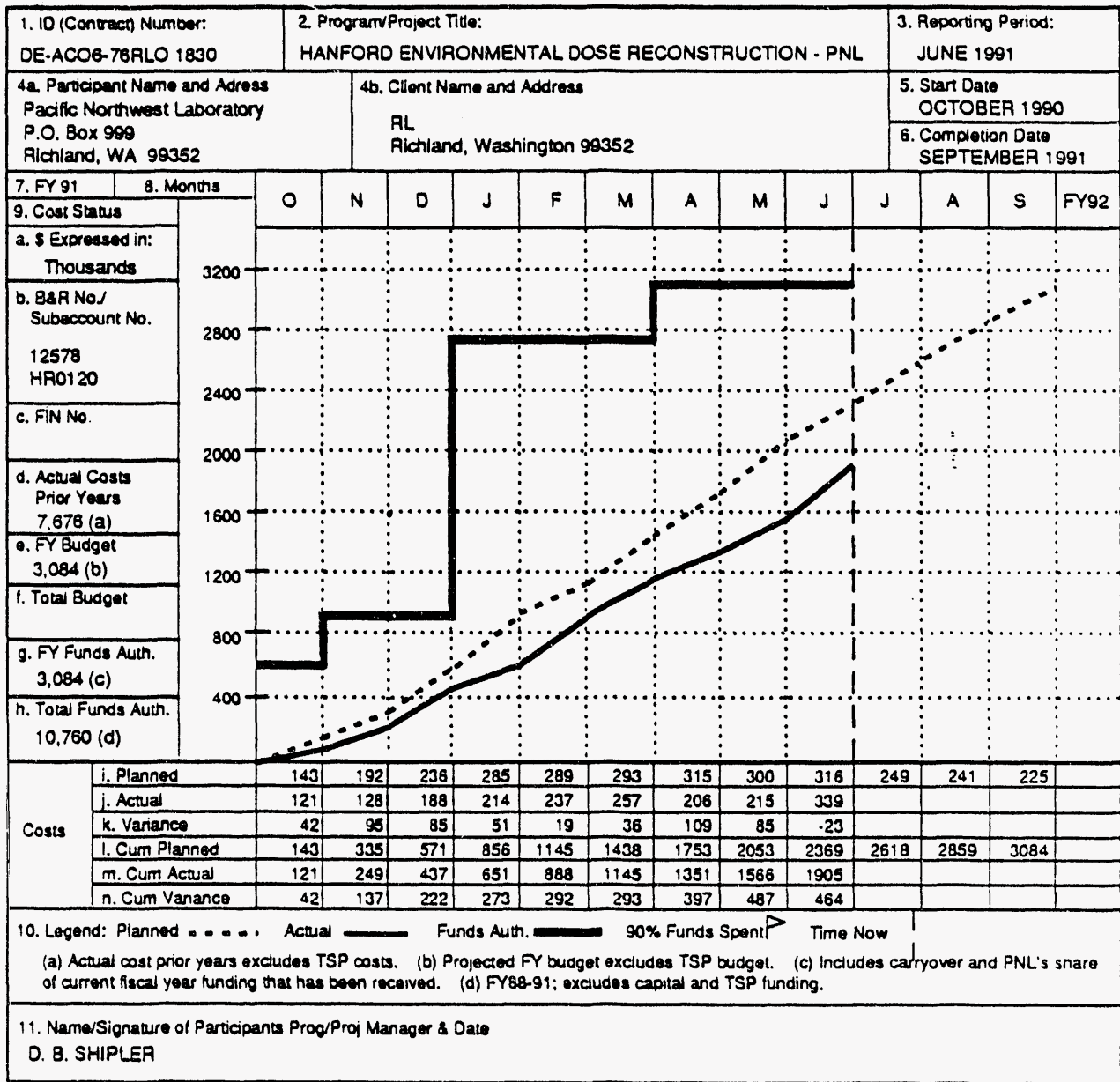


FIGURE 3.3. Example of Project Cost Graph for FY 1991

4.0 TECHNICAL SYSTEMS AND CONTROLS

4.1 CONFIGURATION MANAGEMENT

Configuration management principles are applied to HEDR Project activities as necessary to ensure that requirements and the technical scope are adequately defined, documented, controlled, and can be audited. Project scope, technical approach, quality objectives, milestones, and deliverables are developed, controlled, and changed in the planning process approved by the TSP as discussed in Section 3.0.

Project deliverables to be designed, developed, and controlled are computer codes and their related files and databases. The HEDR Quality Assurance Plan stipulates that Battelle's Software Control Procedures (SCP-70-312 through 318, as shown in Figure 4.1) will be implemented to ensure that requirements are documented, designs are reviewed, test results are recorded, verification and validation activities are carried out, changes are controlled, and application records are maintained.

Controlling technical work is essential to developing and maintaining quality, credibility, and defensibility of technical deliverables. HEDR project controls are designed and implemented to ensure that the performance of work is properly designed, carried out and documented as planned, continuously reviewed in progress, and peer reviewed prior to submittal to the TSP and CDC. The control of changes that affect the approved technical scope is exercised through the change control process, as discussed in the following sections.

4.1.1 Change Control

Revisions to Project and/or TSP approved HEDR requirements, technical scope, approach, deliverables, schedules, and budgets, are managed in a disciplined manner. The change control process requires that a proposed change be identified, defined, documented,

reviewed and approved or disapproved, and that implementation of changes be traceable to controlled documents.

There are two classes of changes: affecting approved Task Plans and thus requiring TSP approval (Class 1), and internal changes requiring only Project Manager approval (Class 2). Thresholds for Class 1 changes are 1) any change in scope, technical approach, data quality objectives, or milestone defraction from approved task plan, 2) any change in milestone schedules of approved Task Plans greater than one month, or 3) any increase in subtask budgets of approved Task Plans of more than 10% or \$10K, whichever is less.

Thresholds for Class 2 changes are 1) changes in scope, approach, data quality objectives, or milestone definitions not affecting statements in TSP-approved Task Plans but affecting staffing, equipment, durations, interfaces, or constraints of TSP-approved subtask plans, 2) any changes in milestone schedules of approved task plans greater than 2 weeks, or 3) any increase in subtask budgets of approved task plans of more than 5% or \$5K, whichever is less.

Change requests are initialed by Subtask Leaders and reviewed and concurred with by the cognizant Task Leader. The Task Leader forwards the request to the Project Manager, who initiates a review by the Assistant Project Manager, the Statistics Task Leader, the Project Coordinator, and other Project Leaders as deemed appropriate. The Project Manager approves necessary Class 2 changes. Necessary Class 1 changes are concurred with by the Project Manager, and the request is implemented and submitted to the TSP. The TSP is expected to take action on the request at its next, regular meeting.

The planning, change request, review and approval, and work authorization process is described in Section 3.2.1, Work

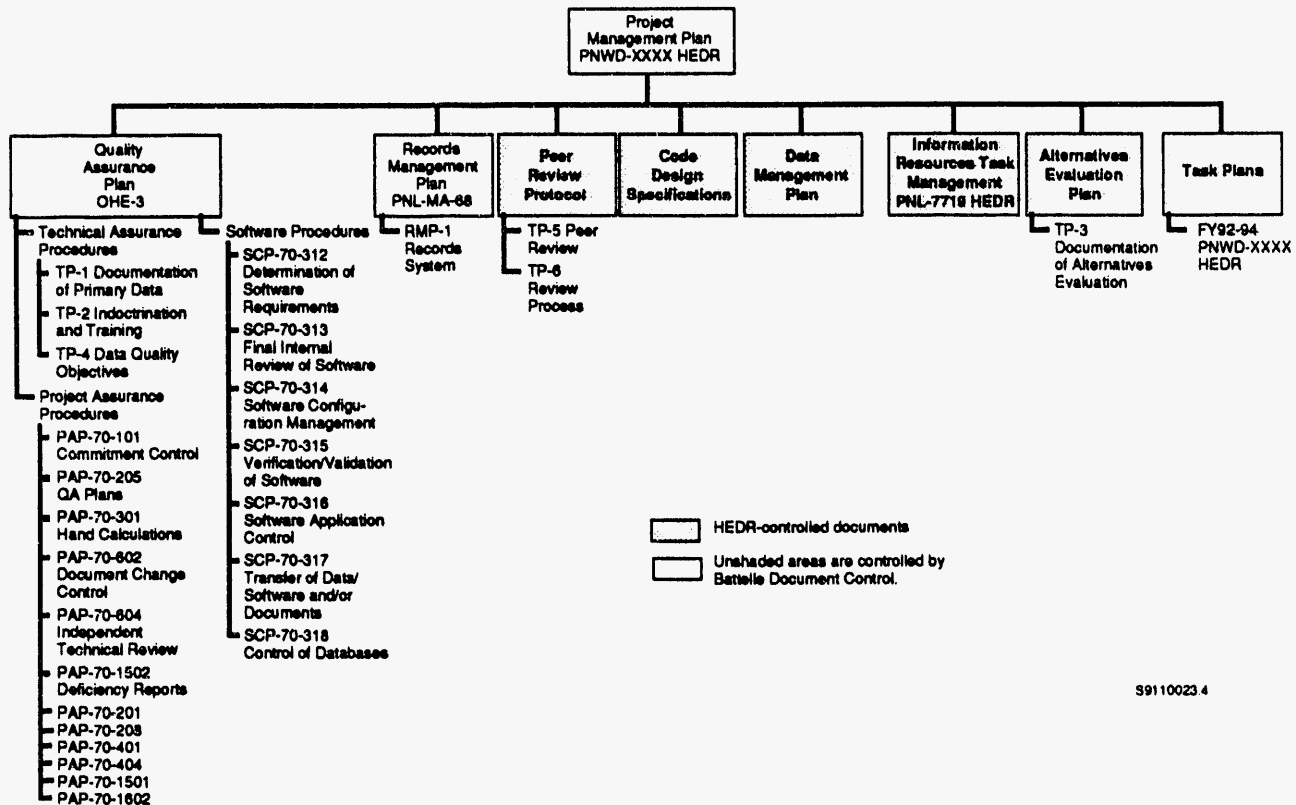


FIGURE 4.1. HEDR Project Document Hierarchy

Authorizations and control. Changes are requested in writing, approved by recorded action of the Project Manager and/or the TSP, and implemented through fiscal year Task Plans and their revisions.

Change control of HEDR-developed software is performed and documented in accordance with SCP-70-314.

See Appendix E for Change Request Record and Change Control Log.

4.2 QUALITY ASSURANCE

Quality assurance (QA) requirements for the HEDR Project, including requirements for data quality objectives, are contained in the HEDR Quality Assurance Plan. Requirements applicable to subcontracts are described in individual Statements of Work in each subcontract or in supplements to each subcontract.

Findings, observations, and concerns identified during audits, surveillances, and continuous support activities are logged and corrective actions are planned and tracked to prevent occurrence or recurrence of nonconformances, as the case may be.

The project provides indoctrination and training of personnel performing activities affecting quality to ensure that suitable proficiency is achieved and maintained. Personnel are trained in appropriate procedures.

The QA requirements established for the HEDR Project also address compliance of work to established requirements. Verifications are performed on a real-time basis in the form of surveillances and on a broader, retrospective basis in the form of audits. In addition, as shown in Figure 3.1, a quality engineer is assigned to the project to assist with implementing QA requirements and meeting project QA objectives.

4.3 TECHNICAL PROCEDURES AND PLANS

The key functions of the project are described in the series of documents shown in Figure 4.1. The controlling document for the project is this Project Management Plan. Other key documents include a Quality Assurance Plan, Code Design Specifications, Records Management Plan, Information Acquisition Plan, and a Peer Review Protocol.

These documents flow down from similar Battelle documents and implement the appropriate Battelle requirements. (For example, the HEDR Project QA Plan tailors Battelle QA requirements to fit specific aspects of the HEDR Project.) The uniqueness of the HEDR Project has required preparation of additional documents, such as the Information Acquisition Plan, which addresses searching for, retrieving, and evaluating Hanford-generated historical documents.

Procedures for implementing the requirements of these plans have been adopted from Battelle procedures or developed to meet specific or unique project needs. The procedures applicable to each plan are also shown in Figure 4.1.

Most Battelle and HEDR Project plans and procedures are controlled and distributed by Battelle Document Control to ensure that current requirements are available to responsible project staff as needed. Project-controlled plans and procedures are identified in Figure 4.1.

4.4 RECORDS AND INFORMATION MANAGEMENT

Records management procedures for the HEDR Project are contained in a Records Management Plan (RMP1-Rev 1). The project maintains a Records Inventory and Disposition Schedule in accordance with documented requirements.

4.5 TECHNOLOGY TRANSFER

Several HEDR-developed technologies will be transferred to other organizations outside Battelle near project completion. They include models for source terms, atmospheric transport and dispersion, Columbia River transport and dilution, exposure pathways, and dose. These models provide input to and estimation of doses to real and representative individuals who lived in a particular area. Along with the computer codes will be extensive databases and files of information reconstructed to represent the atmospheric, demographic, agricultural, and other spatial and temporal geographic information of the area surrounding the Hanford Site since operations began. A key element of technology transfer will be the statistical handling of this immense generation, reconstruction, and compilation of data and the statistical handling of the data by the computer codes. All this technology was developed to ensure the accuracy of the dose estimates. The resulting transferred technologies and databases will represent the leading edge of dose estimating methods. Other organizations will be interested in these capabilities.

4.6 COMMUNICATIONS

HEDR Procedures govern project communications, such as the use of Document Cover Sheets and logging of incoming and outgoing correspondence and telephone conversations. In addition to the issues covered in these procedures, the following guidelines apply:

- *Public access to HEDR work.* All meetings with HEDR staff and TSP members, whether one-on-one or involving a TSP subcommittee, are open to the public at the discretion of the TSP. Copies of material presented at TSP meetings are provided to each TSP member and made available to the public as specified in TSP Directive 89-6. Members of the public or groups can visit HEDR staff or view work in progress at the Laboratory by making prior arrangements through Battelle Communications.

- *Access to HEDR staff by legal representatives.* Requests for information or interviews for use in legal actions are coordinated and approved through the HEDR Project Manager and Battelle's legal staff. Staff receiving subpoenas or other legal summons should notify Battelle Legal immediately.
- *Communications with DOE and CDC.* Communications between Battelle and DOE and Battelle and CDC concerning contractual or other matters are made through the HEDR Project Office.
- *Project materials.* All written HEDR communications with the TSP concerning plans, data, conclusions, status reports, and other similar project information are limited to material that has been reviewed and cleared through Battelle. Procedures HEDR-TP-5 (HEDR Peer Review) and HEDR-TP-6 (HEDR Review Process) apply in these cases. HEDR reports will follow the format provided in Appendix F. Letter reports contain, as a minimum, a cover letter attached to the information being transmitted. Both types of reports are cleared before transmittal to the TSP for review.

- *Proposals to the TSP.* Any proposals to the TSP follow the format specified in TSP Directive 88-1. (This does not include task plans, which follow the format in TSP Directive 90-1.)

- *Outside requests for information.* Verbal and written requests from external sources other than the TSP, HEDR contractors, and the Fred Hutchinson Cancer Research Center are forwarded to the Project Office. Media or public requests for information are directed to HEDR staff who support TSP communications or to the TSP Communications Subcommittee.

4.7 PEER REVIEW

The HEDR Project organization includes a peer review function (Figure 3.1) responsible for planning, providing, and following up major, independent reviews of project plans, performance status, and deliverables. These reviews are conducted in accordance with Battelle guidelines, the HEDR peer review protocols, and procedure HEDR-TP-5, (HEDR Peer Review). Results of reviews are documented and, where necessary, tracked to closure.

5.0 ADMINISTRATIVE SYSTEMS AND CONTROLS

The following sections describe the administrative support systems and controls that will be used to facilitate project planning and control.

5.1 SECURITY

The security requirements for the HEDR Project are in accordance with documented PNL security requirements. The process for identifying, searching for, retrieving, evaluating, declassifying, and making Hanford-originated documents available to project staff and the public are described in Information Resources Task Management Plan, PNL-7719 HEDR, May 1991.

5.2 HEALTH AND SAFETY

The health and safety requirements for the HEDR Project are in accordance with PNL documented requirements and the Environmental, Safety and Health Plan for the Laboratory Programs Directorate.

5.3 PERSONNEL

Project Office staff are assigned to the Office of Hanford Environment. Other staff are provided on a matrix basis from other functional organizations within PNL. Figure 3.1 showed an organization chart of HEDR tasks; Table 5.1 shows the reporting organizations of HEDR task members. Task and Subtask Leaders are considered key staff; their support to the project is negotiated with their line management. The Project Manager provides evaluations of Task and Subtask Leader performance on project assignments to their respective line managers, as input required for staff development reviews in accordance with documented PNL requirements.

5.4 LEGAL AND CONTRACTS

Legal and contract staff provide support to ensure that work can be performed without undue disruption and that Battelle's integrity and reputation are not compromised. Battelle's openness policy, which allows public access to HEDR technical staff and work, carries with it an obligation to maintain equity among plaintiffs and defendants of lawsuits involving DOE and its contractors as well as organizations and individuals representing the public's interest in the information generated by the project.

5.4.1 Legal

Battelle's legal staff provides counsel and support as needed to review issues with legal implications and respond to legal questions. Issues involving HEDR staff or subcontractor actions with potential legal implications are reviewed prior to implementation. Policies are established to preclude unnecessary concerns of the DOE, CDC, TSP, or the public about Battelle's involvement or how legal situations are handled (e.g., staff interactions with litigants). Policies regarding involvement of HEDR staff or subcontractors with ongoing lawsuits related to Hanford operations, either with plaintiffs or defendants, have been implemented to preclude misunderstandings or conflicts of interest and maintain public confidence (e.g., not providing expert testimony for prosecuting or defense attorneys.)

5.4.2 Contracts

Battelle contract services staff established and maintains the legal and contractual liaison with DOE and CDC. The Project Manager, the Contracting Officer, and the financial representative perform contract-related activities to effectively and efficiently perform and complete the project. Because of the unique arrangement between CDC and the TSP for directing the work of the project, the

TABLE 5.1. Battelle Organizations Responsible for HEDR Activities

Org Code	Department Name	Task Number												
		01	02	03	04A	04B	05	06	07	08	09	10	11	12
D611	Project Management Support	X												
D624	Public Outreach												X	X
D625	Technical Information and Communications	X	X						X				X	X
D626	Publication Services and Records Management												X	
D751	Contracts	X												
D762	Process Quality												X	
D7A0	Life Sciences	X												
D7A3	Health Physics		X						X					
D7C1	Computer Sciences		X											
D7C4	Analytical Sciences		X						X	X	X			
D7D1	Atmospheric Sciences				X									
D7D3	Geosciences	X			X									
D7D7	Marine Sciences					X								
D7D8	Environmental Sciences				X	X	X							
D7H1	Technology Systems Analysis	X						X						
D7K3	Office of Hanford Environment	X												
D7P0	National Security Technology				X									
D7R1	Nuclear Systems and Concepts				X									

Task Number Key:

Task 01	Project Management	Task 07	Environmental Pathways and Dose Estimates
Task 02	Technical Integration	Task 08	Statistics
Task 03	Source Terms	Task 09	Records Management
Task 04A	Atmospheric Transport	Task 10	Quality Assurance
Task 04B	Columbia River Transport	Task 11	Information Resources
Task 05	Environmental Monitoring Data	Task 12	TSP Communication Support
Task 06	Demography, Food Consumption, and Agriculture		

Contracting Officer maintains the contractual relationship with CDC and the Project Manager maintains the technical relationship with the TSP. They work together to ensure that the scope, cost, and schedule requirements of the contract are met or appropriately modified in a timely manner.

5.5 PROCUREMENT

Procurement of materials, equipment, and services needed to accomplish technical and/or project objectives are included in the project

budget. Services may be provided by organizations such as other Hanford contractors and private vendors. Procurement activities are conducted in accordance with PNL documented procurement procedures.

5.6 DATABASE MANAGEMENT

Computerized databases are developed, maintained, and made available to management, Task Leaders, peer reviewers, the TSP, and the public as part of project objectives related to open communications, quality,

credible science, and effective and efficient achievement of technical goals. HEDR databases can be categorized as administrative, technical, and communications. Many of these databases are used by Task Leaders and the Project Manager to ensure that technical work is properly performed, controlled, and documented, and to meet quality assurance requirements and objectives. Some database information is also used to prepare HEDR monthly reports, which are submitted to the TSP and made available to the public.

5.6.1 Administrative Databases

Administrative databases include those for project records, action/milestone tracking, document clearance tracking, file transfers, records management, transfers to the Public Reading Room, transfers to the Battelle Records Center, subcontracts status, cost management, invoice management, and those maintained by HEDR Information Resources staff of Hanford-originated historical documents.

The historical documents database is described here because of its key importance to the project and because it is created and maintained in accordance with specific procedures. Information Resources staff identify, search for, retrieve, declassify (if necessary), make available, and annotate Hanford-originated documents in a database called the HEDR Information Resources Tracking System (HIRTS). HIRTS contains bibliographic information on each document such as its number, author, title, date, document form, location, public availability, and names of people who have requested copies. The documents are used by technical HEDR staff and TSP members in dose reconstruction work. Details of how this database is created and maintained are found in the Information Resources Task Management Plan, PNL-7719 HEDR, May 1991.

5.6.2 Technical Databases

Technical databases include annotated bibliographies of Hanford-generated documents, pathway parametric values, dose

conversion values, dose estimates, demographic information, agricultural information, source terms, meteorologic information, ground-water information, surface-water information, and intermediate calculations results. Various technical databases include the QUEST database, which contains health-physics-related journal titles; CHERNOLIT™, which contains Chernobyl-related information; the Source Term Bibliographic Database; a meteorological database comprising meteorological and topographic data files; the Environmental Monitoring Document Database and individual environmental monitoring databases on surface water, fish, and vegetation; and databases of demographic, food consumption, and milk production/distribution information. Databases/files of calculated information such as time- and location-specific integrated air concentrations and integrated depositions, time and location concentrations of nuclides in river water, and other intermediate numerical databases/files, will also be maintained in accordance with the Data Management Plan (being developed).

5.6.3 Communications Databases

Communications-related databases include titles of presentations to the TSP, HEDR documents, open literature publications, and public presentations.

5.7 PROPERTY MANAGEMENT

The Project Office acquires and manages various property items to effectively perform technical, project planning and control, and administrative work. These items include furniture, computer equipment, and audio/visual and telecommunications equipment.

In addition to desktop IBM and Macintosh computers for daily work, the project also maintains an IBM/PC with an ARC/INFO capability (a Geographic Information System) for managing and displaying project temporal and spatial information such as demographics, agricultural practices, cartographic information, dose estimates, meteorological data,

atmospheric dispersion and deposition data, and environmental contamination.

The project acquired a SUN4/RISC computer system and a supporting SPARC2 workstation (with DOE funding) to support environmental transport, pathway, and dose estimating calculations and data storage requirements. Additional computer storage capability was acquired during FY 1992 to support final dose estimations. An optical-disk-based records management system and enhanced, portable, color projection capabilities for the Geographic Information System are also anticipated in FY 1993. No other major property acquisitions are planned through FY 1993. The dose estimating turn-over package (hardware and software) will be defined in FY 1993 for equipment purchases in FY 1994 or 1995.

All acquired property is inventoried and tagged in accordance with DOE and Battelle requirements and audits are performed regularly to ensure proper control.

5.8 SUBCONTRACTOR CONTROLS

The subcontract specialist assigned to the project controls the issuance of subcontracts, negotiates scope and cost in cooperation with a technical administrator, reviews and approves invoices, and ensures that project deliverables are obtained before the subcontract is closed out. Subcontract activities are conducted in accordance with Battelle documented subcontracting procedures. Additional support is provided to establish and maintain Native American subcontracts.

5.9 COMMITMENT CONTROL

The Commitment Control Log for the HEDR Project is maintained by the Project Office. Action items and agreements are documented and tracked. Actions and agreements are documented by item, with an individual assigned responsibility for completion by a specific due date. Samples of input/change and report forms are shown in Appendix G.

APPENDIX A

PROJECT WORK BREAKDOWN STRUCTURE AND TASKS



APPENDIX A

PROJECT WORK BREAKDOWN STRUCTURE AND TASKS

- 1 Project Management
 - 1.1 Project planning and control
 - 1.1.1 Work breakdown structure/dictionary
 - 1.1.2 Network development and control
 - 1.1.3 Planning guidance
 - 1.1.4 Corrective action planning
 - 1.1.5 Project Management Information System
 - 1.1.6 Project management reports
 - 1.1.6.1 HEDR monthly report
 - 1.1.6.2 Financial reports
 - 1.1.6.3 Scope/cost/schedule reports
 - 1.1.6.4 Battelle management reports
 - 1.2 Project documents
 - 1.2.1 Document hierarchy
 - 1.2.2 ~~Project plan~~ (deleted)
 - 1.2.3 Project management plan
 - 1.2.4 Task plans
 - 1.2.5 Quality assurance plan
 - 1.2.6 Other HEDR documents
 - 1.3 Project administration
 - 1.3.1 TSP liaison and response to requests
 - 1.3.2 CDC liaison
 - 1.3.3 Task management and coordination
 - 1.3.4 Staff development
 - 1.3.5 Battelle management liaison
 - 1.3.6 Project computer administration
 - 1.4 Records control
 - 1.4.1 Commitment tracking
 - 1.4.2 Document clearances
 - 1.4.3 Records transfer
 - 1.4.4 Records database management
 - 1.5 Peer review
 - 1.5.1 Plans review
 - 1.5.2 Presentation review
 - 1.5.3 Document review
 - 1.5.4 Technical review
 - 1.6 Subcontract administration
 - 1.6.1 TSP contracts
 - 1.6.2 Native American contracts
 - 1.6.3 Consultants
 - 1.7 Project communications support
 - 1.7.1 Communication planning
 - 1.7.1.1 Communication policy/guidelines development
 - 1.7.2 Communications reviews
 - 1.7.2.1 Finalize Phase I reports
 - 1.7.3 Meeting/workshop support

- 1.7.4 Project communications products
 - 1.7.5 Response to public requests
- 2 Project Technical Integration
- 2.1 Technical sensitivity/uncertainty analysis
 - 2.2 Technical coordination and integration
 - 2.2.1 Planning integration
 - 2.2.2 Public communication
 - 2.2.3 TSP coordination
 - 2.2.4 Native American Working Group liaison
 - 2.2.5 Data integration
 - 2.2.6 Review and interpretation of technical results
 - 2.3 Population dose model requirements
 - 2.3.1 Code design specifications
 - 2.3.2 Dominant radionuclides
 - 2.3.3 Dominant pathways
 - 2.3.4 Characteristics of population groups
 - 2.4 Individual dose model requirements
 - 2.4.1 Code design specifications
 - 2.4.2 Dominant radionuclides
 - 2.4.3 Dominant pathways
 - 2.4.4 Characteristics of individuals
 - 2.5 Code verification/validation
 - 2.5.1 IAEA model intercomparison
 - 2.5.2 Model/code verification and validation plan
 - 2.6 HTDS coordination
 - 2.7 Data management oversight
 - 2.7.1 Data management plan
 - 2.8 Technical planning, control and reporting
 - 2.8.1 Project planning/task planning
 - 2.8.2 Meetings
 - 2.8.2.1 TSP/public meetings
 - 2.8.2.2 Project meetings
 - 2.8.3 Documentation, reporting and publications
 - 2.8.4 Quality objectives, achievements and verification
 - 2.8.5 Project integration/interactions
- 3 Source Terms
- 3.1 Release data availability and review
 - 3.1.1 Data on releases to air
 - 3.1.2 Data on releases to water
 - 3.2 Releases to air
 - 3.2.1 Early iodine releases from separations facilities (1944-1947)
 - 3.2.2 Late iodine releases to air (1947-present)
 - 3.2.3 Releases from separations areas (200 areas)
 - 3.2.3.1 Releases from separations facilities
 - 3.2.3.1.1 Releases from 1944-1957
 - 3.2.3.1.2 Releases from 1957-1990
 - 3.2.3.2 Releases from other separations areas
 - 3.2.4 Releases from reactor areas (100 areas)
 - 3.2.5 Releases from laboratory/test reactor areas (300/400 areas)
 - 3.3 Hanford Historical Releases

- 3.4 Waterborne releases
 - 3.4.1 Waterborne releases (1944-1957)
 - 3.4.2 All waterborne releases
 - 3.4.3 Groundwater releases
 - 3.5 Release model development (day time)
 - 3.5.1 Iodine release model (input to pathways and dose model) - air
 - 3.5.2 Other nuclide release model
 - 3.5.2.1 Air
 - 3.5.2.2 Water
 - 3.5.3 Model validation and verification
 - 3.6 Technical planning, control and reporting
 - 3.6.1 Project planning/task planning
 - 3.6.2 Meetings
 - 3.6.2.1 TSP/public meetings
 - 3.6.2.2 Project meetings
 - 3.6.3 Documentation, reporting and publications
 - 3.6.4 Quality objectives, achievements and verification
 - 3.6.5 Project integration/interactions
- 4 Environmental Transport
- 4.1 Atmospheric transport
 - 4.1.1 Model restructuring and revision
 - 4.1.1.1 Wind (uncertainty)
 - 4.1.1.2 Stability (spatial variation and uncertainty)
 - 4.1.1.3 Mixing layer (calculation, spatial variation, uncertainty)
 - 4.1.1.4 Precipitation (uncertainty, spatial variation)
 - 4.1.1.5 Temperature (uncertainty)
 - 4.1.1.6 Wind profiles (uncertainty)
 - 4.1.1.7 Surface roughness (find data)
 - 4.1.1.8 Characteristic turbulence velocity (uncertainty)
 - 4.1.1.9 Diffusion coefficients (revise, uncertainty)
 - 4.1.1.10 Deposition (resistance model, spatial variation, uncertainty)
 - 4.1.1.11 Washout (uncertainty and spatial variation)
 - 4.1.1.12 Plume rise (uncertainty)
 - 4.1.1.13 Transport at center of mass
 - 4.1.1.14 Mass balance
 - 4.1.1.15 Multiple sources
 - 4.1.1.16 Polar grid (close-in workers)
 - 4.1.1.17 Input/output modification
 - 4.1.2 Wind field modeling
 - 4.1.2.1 Literature search and model evaluation
 - 4.1.2.2 Tests
 - 4.1.2.3 Implementation
 - 4.1.3 Model sensitivity
 - 4.1.3.1 Release time
 - 4.1.3.2 Wind data (resolution)
 - 4.1.3.3 Temperature (plume rise)
 - 4.1.3.4 Precipitation
 - 4.1.3.5 Mixing layer thickness
 - 4.1.3.6 Surface roughness
 - 4.1.3.7 Diffusion parameterization
 - 4.1.3.8 Deposition parameterization and deposition velocity

- 4.1.4 Meteorological database
 - 4.1.4.1 Hourly data (wind, stability, precipitation, and temperature)
 - 4.1.4.2 Daily data (precipitation)
 - 4.1.4.3 Surface roughness
- 4.1.5 Model validation
 - 4.1.5.1 Validation data sets
 - 4.1.5.2 Detailed validation plan
 - 4.1.5.3 Validation model runs
- 4.1.6 Final documentation
 - 4.1.6.1 Database
 - 4.1.6.2 Computer model
- 4.1.7 Calculations
 - 4.1.7.1 HTDS
 - 4.1.7.2 Chronic releases
 - 4.1.7.3 Special studies (e.g., "green run")
 - 4.1.7.3.1 Database preparation
 - 4.1.7.3.2 Model modification
 - 4.1.7.3.3 Model documentation
 - 4.1.7.3.4 Calculation
- 4.1.8 Special studies
 - 4.1.8.1 Resuspension
 - 4.1.8.2 Thunderstorms
 - 4.1.8.3 Air chemistry of I-131
- 4.2 Ground-water transport
 - 4.2.1 Well data analysis
 - 4.2.1.1 On-site well data evaluation
 - 4.2.1.2 Off-site well data evaluation
 - 4.2.2 Air deposition to groundwater transfer
 - 4.2.3 Off-site migration
 - 4.2.3.1 Effects on off-site wells
 - 4.2.3.2 Effects on the river
- 4.3 Surface-water transport
 - 4.3.1 Monitoring data evaluation
 - 4.3.1.1 Data/information assembly
 - 4.3.1.2 Develop bibliography
 - 4.3.1.3 Data quality evaluation
 - 4.3.1.4 Data gaps reconciliation (time/location)
 - 4.3.2 Conceptual modeling
 - 4.3.2.1 Basic river processes
 - 4.3.2.2 Significant locations/times
 - 4.3.2.3 Numerical modeling approach
 - 4.3.3 Calculation of concentrations
 - 4.3.3.1 Initial screening calculations
 - 4.3.3.2 Concentrations at points of interest
 - 4.3.3.3 Database for dose model
- 4.4 Technical planning, control and reporting
 - 4.4.1 Project planning/task planning
 - 4.4.2 Meetings
 - 4.4.2.1 TSP/public meetings
 - 4.4.2.2 Project meetings
 - 4.4.3 Documentation, reporting and publications

- 4.4.4 Quality objectives, achievements and verification
- 4.4.5 Project integration/interactions

5 Environmental Monitoring Data

- 5.1 Data availability and review
 - 5.1.1 Document search, review, and collection
 - 5.1.2 Document inventory and database entry
 - 5.1.3 Data evaluation and maintenance
- 5.2 Terrestrial data (vegetation, crops, food stuff and soil)
 - 5.2.1 Document review and inventory
 - 5.2.2 Data extraction and database entry
 - 5.2.3 Sampling methods review and evaluation
 - 5.2.4 Analytical methods review and evaluation
 - 5.2.5 Biases and uncertainties
 - 5.2.6 Hanford contributions
- 5.3 Surface-water data (Columbia River, sediments, aquatic biota)
 - 5.3.1 Document review and inventory
 - 5.3.2 Data extraction and database entry
 - 5.3.3 Sampling methods review and evaluation
 - 5.3.4 Analytical methods review and evaluation
 - 5.3.5 Biases and uncertainties
 - 5.3.6 Hanford contributions
- 5.4 Air data
 - 5.4.1 Document review and inventory
 - 5.4.2 Data extraction and database entry
 - 5.4.3 Sampling methods review and evaluation
 - 5.4.4 Analytical methods review and evaluation
 - 5.4.5 Biases and uncertainties
 - 5.4.6 Hanford contributions
- 5.5 Ground-water data
 - 5.5.1 Document review and inventory
 - 5.5.2 Data extraction and database entry
 - 5.5.3 Sampling methods review and evaluation
 - 5.5.4 Analytical methods review and evaluation
 - 5.5.5 Biases and uncertainties
 - 5.5.6 Hanford contributions
- 5.6 Technical planning, control and reporting
 - 5.6.1 Project planning/task planning
 - 5.6.2 Meetings
 - 5.6.2.1 TSP/public meetings
 - 5.6.2.2 Project meetings
 - 5.6.3 Documentation, reporting and publications
 - 5.6.4 Quality objectives, achievements and verification
 - 5.6.5 Project integration/interactions

6 Demographics, Agriculture, Food Habits

- 6.1 Demographics
 - 6.1.1 General population
 - 6.1.1.1 Phase I Area
 - 6.1.1.2 Extension of geographic study area
 - 6.1.1.3 Duration of residence/migration
 - 6.1.2 Special populations

- 6.1.2.1 Native American tribes
- 6.1.2.2 Construction workers
- 6.1.2.3 Military
- 6.1.2.4 Migrant workers
- 6.1.2.5 Extension of geographic study area
- 6.2 Agriculture
 - 6.2.1 Milk production and distribution model
 - 6.2.1.1 Survey of producers - feeding
 - 6.2.1.2 School lunch sources of milk
 - 6.2.1.3 Extension of geographic study area
 - 6.2.2 Vegetables (and fresh fruits) model
 - 6.2.3 Other agricultural models
- 6.3 Lifestyles
 - 6.3.1 Populations
 - 6.3.2 Individuals
- 6.4 Food consumption
 - 6.4.1 General population
 - 6.4.1.1 Actual distributions
 - 6.4.1.2 Age-related factors
 - 6.4.1.3 Consumption for infants, nursing and pregnant women
 - 6.4.1.4 Dairy products, fruits and vegetables
 - 6.4.1.5 Wildlife and other local products
 - 6.4.2 Special populations
 - 6.4.2.1 Native Americans
 - 6.4.2.2 Construction workers
 - 6.4.2.3 Military
 - 6.4.2.4 Migrant workers
- 6.5 Technical planning, control and reporting
 - 6.5.1 Project planning/task planning
 - 6.5.2 Meetings
 - 6.5.2.1 TSP/public meetings
 - 6.5.2.2 Project meetings
 - 6.5.3 Documentation, reporting and publications
 - 6.5.4 Quality objectives, achievements and verification
 - 6.5.5 Project integration/interactions
- 7 Environmental Pathways and Dose Estimates
 - 7.1 Code development
 - 7.1.1 Pathway development
 - 7.1.1.1 Air pathway
 - 7.1.1.1.1 Cow/milk
 - 7.1.1.1.2 Vegetation
 - 7.1.1.1.3 Meat
 - 7.1.1.1.4 Poultry/eggs
 - 7.1.1.1.5 Immersion
 - 7.1.1.1.6 Sky shine
 - 7.1.1.1.7 Ground shine
 - 7.1.1.1.8 Soil
 - 7.1.1.1.9 Inhalation
 - 7.1.1.2 Water pathway
 - 7.1.1.2.1 Fish/aquatic biota
 - 7.1.1.2.2 Drinking water

- 7.1.1.2.3 Immersion
 - 7.1.1.2.4 Boating/fishing/shoreline
 - 7.1.2 Code structuring
 - 7.1.2.1 Correlations/demodularization
 - 7.1.2.2 Dynamics
 - 7.1.2.3 Data handling
 - 7.1.3 Coding implementation
 - 7.1.3.1 Writing code
 - 7.1.3.2 Verification/bench marking
 - 7.1.3.3 Quality assurance
 - 7.1.4 Code documentation
 - 7.1.4.1 Theory manuals
 - 7.1.4.2 Users manuals
 - 7.1.4.3 Dose estimation turnover package
 - 7.1.5 Model/code validation
 - 7.1.5.1 Monitoring data
 - 7.1.5.2 Bioassay data
- 7.2 Dose Calculations
 - 7.2.1 Population group doses
 - 7.2.1.1 Native American tribes doses
 - 7.2.1.1.1 Yakima
 - 7.2.1.1.2 Umatilla
 - 7.2.1.1.3 Nez Perce
 - 7.2.1.1.4 Colville
 - 7.2.1.1.5 Coeur d'Alene
 - 7.2.1.1.6 Kalispel
 - 7.2.1.1.7 Warm Springs
 - 7.2.1.1.8 Spokane
 - 7.2.1.2 Military doses
 - 7.2.1.3 Migrant doses
 - 7.2.1.4 Construction worker doses
 - 7.2.2 Individual doses
 - 7.2.2.1 HTDS doses
 - 7.2.2.1.1 Feasibility study doses
 - 7.2.2.1.2 Full study doses
 - 7.2.2.2 Individuals on request
 - 7.2.3 Nuclides of interest
 - 7.2.3.1 Iodine doses
 - 7.2.3.2 Ruthenium doses
 - 7.2.3.3 Plutonium doses
 - 7.2.3.4 Other nuclides
 - 7.2.4 Pathways of interest
 - 7.2.4.1 Air pathway doses
 - 7.2.4.2 River pathway doses
 - 7.2.4.3 Groundwater pathway doses
 - 7.2.4.4 River irrigation doses
 - 7.2.4.5 Cistern doses
 - 7.2.4.6 Rain-out doses
 - 7.2.4.7 Other pathways of interest
 - 7.2.5 Special release events
 - 7.2.5.1 "Green run" doses

- 7.2.5.2 Fuel failures
 - 7.2.5.3 "Hot particles"
 - 7.3 Model parameter development
 - 7.3.1 Dose factors
 - 7.3.2 Transfer factors
 - 7.3.3 Accumulation Factors
 - 7.4 Technical planning, control and reporting
 - 7.4.1 Project planning/task planning
 - 7.4.2 Meetings
 - 7.4.2.1 TSP/public meetings
 - 7.4.2.2 Project meetings
 - 7.4.3 Documentation, reporting and publications
 - 7.4.4 Quality objectives, achievements and verification
 - 7.4.5 Project integration/interactions
- 8 Statistics support
 - 8.1 Technical Integration (Task 02)
 - 8.1.1 Restructuring pathway dose codes
 - 8.1.1.1 Air
 - 8.1.1.2 Water
 - 8.1.2 Developing data management within pathway dose codes
 - 8.1.3 Review task plans and data quality objectives
 - 8.1.4 Review products
 - 8.1.5 Statistics publications
 - 8.2 Source Terms (Task 03)
 - 8.2.1 Review task plan and data quality objectives
 - 8.2.2 Review products
 - 8.2.3 Sensitivity/uncertainty analysis and data management
 - 8.2.4 Review/evaluate/assist with data and calculations
 - 8.3 Environmental transport (Task 04)
 - 8.3.1 Review task plan and data quality objectives
 - 8.3.2 Review products
 - 8.3.3 Sensitivity/uncertainty analysis and data management
 - 8.3.4 Review/evaluate/assist with data and calculations
 - 8.4 Environmental monitoring data (Task 05)
 - 8.4.1 Review task plan and data quality objectives
 - 8.4.2 Review products
 - 8.4.3 Review/evaluate/assist with data and calculations
 - 8.4.4 Validation of air dispersion model
 - 8.5 Demographics, agriculture, food habits (Task 06)
 - 8.5.1 Review task plan and data quality objectives
 - 8.5.2 Review products
 - 8.5.3 Review/evaluate/assist with data and calculations
 - 8.5.4 Sensitivity/uncertainty analysis and data management
 - 8.6 Environmental pathways and dose estimates (Task 07)
 - 8.6.1 Review task plan and data quality objectives
 - 8.6.2 Review products
 - 8.6.3 Sensitivity/uncertainty analyses and data management
 - 8.7 Technical planning, control and reporting
 - 8.7.1 Project planning/task planning
 - 8.7.2 Meetings

- 8.7.2.1 TSP/public meetings
 - 8.7.2.2 Project meetings
 - 8.7.3 Documentation, reporting and publications
 - 8.7.4 Quality objectives, achievements and verification
 - 8.7.5 Project integration/interactions
- 9 Records Management
- 9.1 Battelle records management
 - 9.2 DOE Field Office, Richland, Public Reading Room
 - 9.3 Task planning, control and reporting
 - 9.3.1 Project planning/task planning
 - 9.3.2 Project meetings
 - 9.3.3 Documentation, reporting and publications
 - 9.3.4 Quality objectives, achievements and verification
- 10 Quality Assurance
- 10.1 Quality assurance procedures
 - 10.2 Data quality objectives
 - 10.3 Quality improvement
 - 10.4 Quality verification activities
 - 10.5 Task planning, control and reporting
 - 10.5.1 Project planning/task planning
 - 10.5.2 Project meetings
 - 10.5.3 Documentation, reporting and publications
 - 10.5.4 Project integration/interaction
- 11 Information Resources
- 11.1 Document declassification
 - 11.2 Resource identification and availability
 - 11.3 Task planning, control and reporting
 - 11.3.1 Project planning/task planning
 - 11.3.2 Project meetings
 - 11.3.3 Documentation, reporting and publications
 - 11.3.4 Quality objectives, achievements and verification
- 12 TSP Communications Support
- 12.1 Public outreach support
 - 12.1.1 Video
 - 12.1.1.1 Production
 - 12.1.1.2 Distribution
 - 12.1.2 Posters
 - 12.1.2.1 Production
 - 12.1.2.2 Distribution
 - 12.1.3 Document accessibility
 - 12.2 Communication Assessment
 - 12.2.1 Focus groups
 - 12.2.2 Individuals
 - 12.3 Audience analysis
 - 12.3.1 Public meeting attendance
 - 12.3.2 Clippings
 - 12.4 Presentation coordination
 - 12.5 TSP meeting/workshop/symposia support

- 12.6 TSP materials support
 - 12.6.1 Material supply
 - 12.6.2 Reviews
 - 12.6.3 Editing/writing
 - 12.6.4 Document retrieval
- 12.7 Task planning, control and reporting
 - 12.7.1 Project planning/task planning
 - 12.7.2 Meetings
 - 12.7.2.1 TSP/public meetings
 - 12.7.2.1 Project meetings
 - 12.7.3 Documentation, reporting and publications
 - 12.7.4 Quality objectives, achievements and verification

TABLE A.1. HEDR Project Tasks

<u>WBS Element^(a)</u>	<u>Task</u>	<u>Subtask</u>	<u>Task Manager</u>
	01	Project Management	DB Shipler
1.1, 1.2		0101 Project Planning and Control	
1.3, 1.4, 1.6, 1.7		0103 Project Administration	
1.5		0104 Project Peer Review	
	02	Technical Integration	BA Napier
2.8		0201 Technical Planning, Control, and Reporting	
2.1, 2.2, 2.6, 2.7		0204 Project Technical Coordination and Analysis	
2.3, 2.4, 2.5		0205 Pathways and Dose Model Requirements	
	03	Source Terms	CM Heeb
3.6		0301 Technical Planning, Control, and Reporting	
3.2		0303 Radioactive Releases to Air	
3.4		0304 Radioactive Releases to Water	
3.5		0305 Release Model Development, Verification, and Validation	
3.3		0306 Hanford Historical Releases	
3.1		0307 Radioactive Release Data Availability and Review	
	04A	Atmospheric Transport	JV Ramsdell
4.4		0401 Technical Planning, Control, and Reporting	
4.1.1, 4.1.2,		0402 Atmospheric Model Development and Evaluation	
4.1.3, 4.1.5,			
4.1.6			
4.1.4		0405 Atmospheric Model Database	
4.1.7		0406 Atmospheric Model Calculations	
	04B	Columbia River Transport	WH Walters
4.4		0401 Technical Planning, Control, and Reporting	
4.3		0404 Surface-Water Transport	
	05	Environmental Monitoring Data	DH Denham
5.6		0501 Technical Planning, Control, and Reporting	
5.2		0502 Terrestrial Monitoring Data	
5.1		0503 Environmental Monitoring Data Availability and Review	
5.3		0504 Surface-Water Monitoring Data	
5.4		0505 Air Monitoring Data	
	06	Demography, Food Consumption, and Agriculture	GL Wilfert
6.5		0601 Technical Planning, Control, and Reporting	
6.4		0602 Food Consumption	
6.2		0603 Milk and Other Food Model Development	
6.1, 6.3		0604 Demographics	
6.4.2		0605 Native American Data	
	07	Environmental Pathways and Dose Estimates	WT Farris
7.4		0701 Technical Planning, Control, and Reporting	
7.1		0702 Pathways and Dose Code Development and Documentation	
7.3		0703 Pathways and Dose Model Parameter Development	
7.1.5		0704 Pathways and Dose Model/Code Verification and Validation	
7.2		0705 Dose Calculations	

TABLE A.1. (contd)

<u>WBS Element^(a)</u>	<u>Task</u>	<u>Subtask</u>	<u>Task Manager</u>
8.7 8.2, 8.3, 8.4 8.5, 8.6 8.1	08	Statistics 0801 Technical Planning, Control, and Reporting 0802 Statistics Support for Project Technical Task Work 0803 Analysis of Model Reliability	RO Gilbert
9.3 9.1, 9.2	09	Records Management 0901 Technical Planning, Control, and Reporting 0902 Project Records Management	DL Martin
10.5 10.1, 10.2, 10.3 10.4	10	Quality Assurance 1001 Technical Planning, Control, and Reporting 1002 Quality Assurance Program Development 1003 Quality Assurance Verification	DL Stewart
11.3 11.1 11.2	11	Information Resources 1101 Technical Planning, Control, and Report 1102 Hanford Document Declassification 1103 Hanford Information Resources Identification and Search	GL Harvey
12.7 12.1 12.2, 12.3 12.4, 12.5, 12.6 7.1, 4.3	12	TSP Communication Support 1201 Technical Planning, Control, and Reporting 1202 TSP Public Outreach Support 1203 Communications Assessment Research 1204 TSP Meeting and Materials Support 1206 Dose Estimating Turnover Package	GL Harvey

(a) See Figure 2.1 for WBS element titles that correspond to these numbers.

APPENDIX B
PROJECT SUMMARY SCHEDULE

HEDR PROJECT ACTIVITIES

PROJECT MANAGEMENT
 Planning and Control
 Quality Assurance
 Information Resources

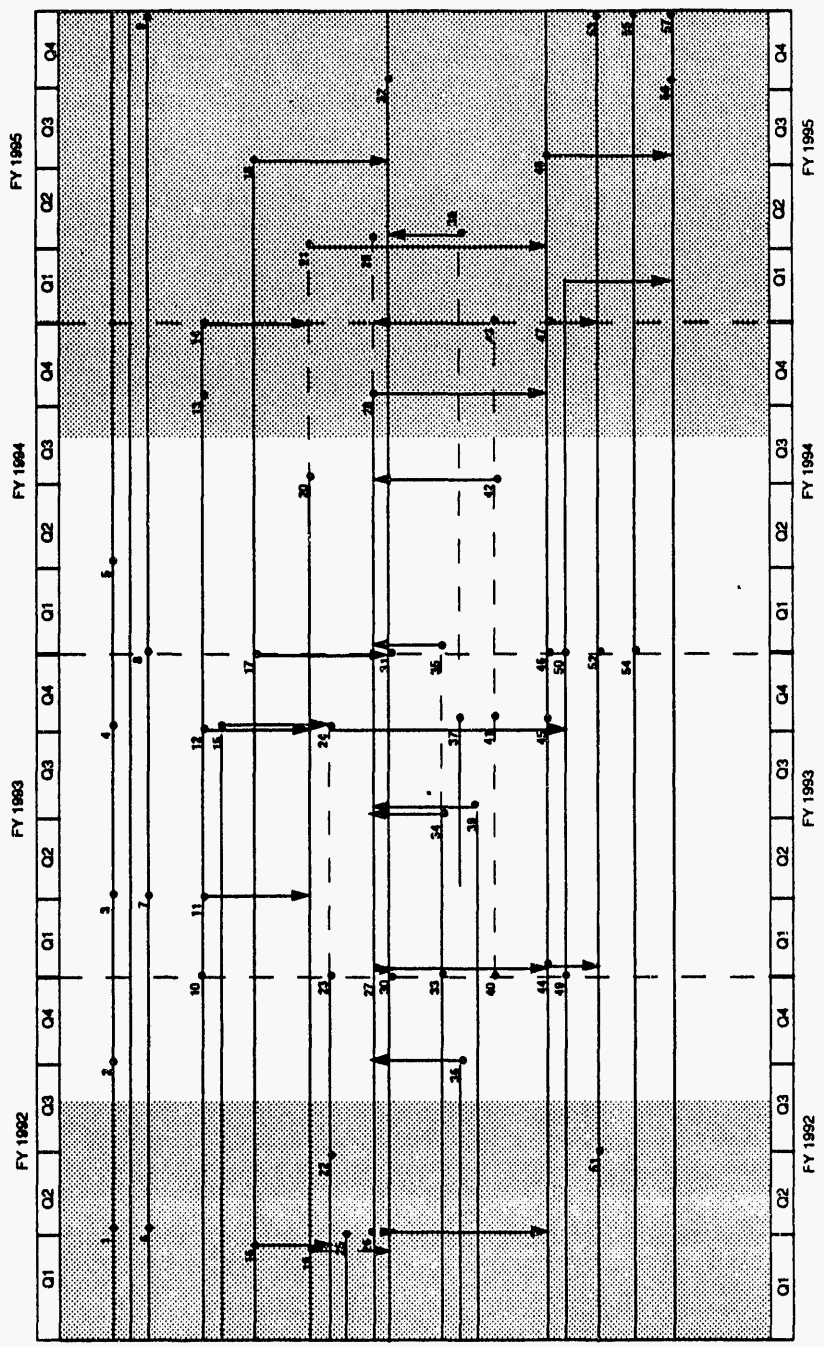
SOURCE TERM
 Air
 Surface Water

ENVIRONMENTAL MONITORING DATA
ENVIRONMENTAL TRANSPORT
 Atmospheric Transport/Deposition Model
 Surface Water Transport Model
 Ground Water Transport
 Pathways and Dose Model
 Model Verification/Sensitivity/Uncertainty

DEMOGRAPHYLIFESTYLE/FOOD
 Milk Model
 Other Food Production
 Food Consumption
 Demographic Data

DOSE ESTIMATES
 Air Pathways
 Surface Water Pathways

NATIVE AMERICAN INVOLVEMENT



Notes

- White area indicates contract period; shaded areas indicate TSP-approved work that contributes to, or was begun in, the contract period.
- Numbers in chart indicate deliverables, which are listed in Table B.1 and described in more detail in the integrated task plans.

FIGURE B.1. HEDR Project Summary Schedule

December 19, 1991

TABLE B.1. HEDR Project Milestones and Decisions (Those that are shaded are before or after the CDC contract period; unshaded ones are within the contract period. Milestones shown here are in the CDC/Battelle contract. Battelle has additional milestones that document smaller pieces of work. All the milestones are shown in the HEDR integrated Task Plans document).

PSS ^(a)	Task Plans ^(b)	Description	Date
1.	0101C	Project Management Plan and FY 1992 Task Plans	3/31/92
2.	0101D	FY 1992 Revised Task Plans	4/30/92
3.	0101G	FY 1993 Task Plans	1/01/93
4.	0101E	FY 92-94 Integrated Task Plans	9/30/93
5.	0101I	Project Final Report	3/31/94
6.	--	Information Resources Plan	1/01/92
7.	1102A	Information Resources Summary Report	1/01/93
8.	1103B	Information Resources Summary Report	9/30/93
9.	--	Information Resources Final Report	9/30/95
10.	--	Key Nuclides Decision (TSP) ^(c)	9/30/92
11.	0303B	I-131 Source Term (1944-1991)	12/31/92
12.	0303D	Key Radionuclides Report, Air	6/30/93
13.	--	All Key Radionuclides, All Years	6/30/94
14.	--	Other Special Interest Nuclides	9/30/94
15.	0304B	Reactor Releases to Surface Water (1944-1991)	6/30/93
17.	0502C	Monitoring Data Report	9/30/93
16.	0404A	Columbia River Pathway Report	4/30/92
18.	--	Monitoring Data Report	3/31/95
19.	0402B	Atmospheric Transport/Deposition Model	2/01/92
20.	--	Atmospheric Transport, Extended Region Decision (TSP)	3/31/94
21.	--	Atmospheric Transport Model, Extended Region (TSP)	12/31/94
22.	--	Surface Water Dose Monitoring/Modeling Decision (TSP)	3/31/92
23.	--	Surface Water Extended Region Decision	9/30/92
24.	0404C	Surface Water Transport Model	9/30/93

TABLE B.1. (contd)

<u>PSS^(a)</u>	<u>Task Plans^(b)</u>	<u>Description</u>	<u>Date</u>
25.	0403A	Groundwater Report	1/01/92
26.	0702A	Individual Dose Model, Major Pathways	2/01/92
27.	0702B	Population Dose Model	10/30/92
28.	--	Individual Dose Model, Minor Pathways	6/30/94
29.	--	Special Group Dose Model	12/31/95
30.	--	Verification/Validation Plan Decision (TSP)	9/30/92
31.	0803B	Model Verification/Sensitivity/Uncertainty Report	9/30/93
32.	--	Model Verification/Validation Status Report	6/30/95
33.	--	Milk Model, Extended Region Decision (TSP)	9/30/92
34.	0603D	Milk Production and Distribution Model (19 counties)	3/31/93
35.	0603E	Milk Production and Distribution Model, Extended Region	9/30/93
36.	0603C	Food Production and Distribution, Green Leafy Vegetables (19 counties)	9/30/92
37.	--	Food Production, Extended Region Decision (TSP)	6/30/93
38.	--	Food Production Report, Extended Region	12/30/94
39.	0602C	Food Consumption Report	3/31/93
40.	--	Leafy Vegetable, Extended Region Decision (TSP)	9/30/92
41.	--	Demographic Data, Special Groups Decision (TSP)	6/30/93
42.	--	Demographic Data, Special Groups	3/31/94
43.	--	Demographic Data, Extended Region	9/30/94
44.	--	Native American Phase I Doses (Battelle - dose calculations; TSP - report)	9/30/92
45.	0705A	I-131 Dosimetry Report	6/30/93
46.	0705C	Key Radionuclides Dosimetry Report, Air	9/30/93
47.	--	Native American Doses (Battelle - dose calculations; TSP - report)	9/30/94
48.	--	All Radionuclides Dosimetry Report, All Regions, All Years	3/31/95

TABLE B.1. (contd)

<u>PSS^(a)</u>	<u>Task Plans^(b)</u>	<u>Description</u>	<u>Date</u>
49.	--	Native American Continuing Research Plan (TSP)	9/30/92
50.	0705B	Surface Water Dosimetry Report	9/30/93
51.	0705D	Native American Phase I Data Report	9/30/93
52.	--	Continuing Native American Research Report (TSP)	9/30/93
53.	--	Continuing Native American Research Report (TSP)	9/30/95
54.	--	Communications Report (TSP)	9/30/93
55.	--	Communications Report (TSP)	9/30/95
56.	--	Final Dosimetry Report	6/30/95
57.	--	Dose Calculation Methodology (hardware and software turnover package)	9/30/95

(a) PSS = Milestone number that appears in Project Summary Schedule (Figure B.1).

(b) Milestones that appear Task Plans.

(c) TSP = Deliverable or decision of the Technical Steering Panel. HEDR planned work is based on the assumption that all TSP decisions shown in this table result in a "yes," i.e., that the work will be done. For example, Project Summary Schedule deliverable 22--Surface Water Dose Monitoring/Modeling Decision (TSP)--is assumed to result in the TSP directing HEDR staff to create the surface-water transport model shown in Project Summary Schedule Milestone 24.

NOTES:

Assumptions associated with milestones are described in the Integrated Task Plans.

Dates shown are when the milestones are provided to the TSP and CDC for review. Comments by the TSP and CDC on deliverables will be returned to BNW within one month, via the TSP. Battelle-Northwest will provide final reports one month later.

APPENDIX C

BATTELLE HEDR SPEND PLAN



APPENDIX C

TABLE C.1. Battelle HEDR Spend Plan (\$ in thousands)

Task No.	Task Title	Actual Costs FY 1988-1991	FY 1992 Budget ^(a)	FY 1993 Budget ^(b)	FY 1994 through May-94 Budget ^(c)	Total Project Budget ^(d)
01	Project Management	3,048	1,129	1,030	358	5,565
02	Technical Integration	285	294	409	197	1,185
03	Source Terms	835	332	446	86	1,699
04	Environmental Transport	1,491	506	497	86	2,580
05	Environmental Monitoring Data	698	166	233	135	1,232
06	Demography, Food Consumption, and Agriculture	1,627	554	316	185	2,682
07	Environmental Pathways and Dose Estimates	990	415	342	281	2,028
08	Statistics	408	380	310	117	1,215
09	Records Management	299	55	69	80	503
10	Quality Assurance	36	60	66	33	195
11	Information Resources	578	164	180	67	989
12	TSP Communications Support	310	68	39	17	434
	HEDR Project Total	<u>10,605</u>	<u>4,123</u>	<u>3,937</u>	<u>1,642</u>	<u>20,307</u>
	Technical Steering Panel	2,250	864	0	0	3,114
	Native American Research	<u>0^(e)</u>	<u>241</u>	<u>0</u>	<u>0</u>	<u>241</u>
	TOTAL PROJECT	12,855	5,228	3,937	1,642	23,662

(a) The FY 1992 budget is funded from DOE at \$3,828K and CDC at \$1,400K.

(b) The FY 1993 budget includes \$13K for Subtask 0103 not funded by CDC in FY 1992 but included in the total contract and \$23K for Subtask 0603 that was not funded in FY 1992 as a result of the funding shortfall.

(c) The current contract with CDC ends May 31, 1994.

(d) The total project budget includes actual costs, FY 1988-1992, and the budget, FY 1992-1994.

(e) Prior to FY 1992, the Native American research costs were shown as part of the HEDR Project total in Task 06.

APPENDIX D

OUTLINE FOR MONTHLY REPORT INPUT, BY TASK



APPENDIX D

OUTLINE FOR MONTHLY REPORT INPUT, BY TASK

Objective

This paragraph is a concise statement of the objectives of the task.

Progress (By Milestone and/or Subtask)

This section summarizes key technical activities and significant results under the milestone to which they contribute. On work that does not contribute to a specific milestone, list it under the applicable subtask or major work element. Give enough detail to give the general public an idea of what you did, how it contributes to the milestone, and what made the activity significant. Make a general statement about what was learned or found when an activity is identified as completed.

In cases where one task funds work that is being contributed to by another task, the lead task is responsible for reporting all work in that area. Do not list work that all tasks took part in, such as planning or team meetings. List conferences, trips, submission of reports, and visitors only when an impact on the project is explained.

Major Problem Areas or Changes and Action Taken

Describe potential problems and describe actions to prevent their occurrence or minimize their impact. Identify existing problems

and corrective actions to get back on cost/schedule. Describe decisions that have not been made that affect the progress of technical work. Describe what information you will provide as a basis for making the decision or what other action you will take to make sure the decision will or can be made. Describe any changes in the approach or scope of work previously agreed upon in task plans. Problems discussed here, if they affect costs or schedule, should also be consistent with discussions under "Variance."

Variance

This section is for identifying any cost or schedule variances. Include information about what the variance is (cost or schedule), what caused it, and how it will be corrected. Explain cumulative cost variances that are 15% or \$25,000 over or under the budgeted cumulative amount, whichever is smaller. Otherwise, the words "no significant cumulative variance" should appear. In monthly report input to Project Office, explain monthly variances and corrective actions.

Explain schedule variances that occur when your work deviates from the planned schedule.

Planned Work for the Next Three Months

Statement of work to be performed and milestones due in the next three months.

APPENDIX E

CHANGE REQUEST RECORD AND CHANGE CONTROL LOG



Hanford Environmental Dose Reconstruction Project

CHANGE REQUEST RECORD

1. Project Title HEDR Project	2. Project Number	3. Class	4. CRR Number	5. Log Date	6. Date Approval Needed	7. Priority <input type="checkbox"/> Emergency <input type="checkbox"/> Urgent <input type="checkbox"/> Routine	
8. Title of Change _____ Description						9. Distribution	
10. Reasons for Change							
11. Impact on Schedule							
12. Documents, Scopes or Milestones Affected				13. Subtasks Affected			
14. Impact(s) on Budget				New Budget At Completion	Old Budget At Completion	Net Change	New Total Estimate at Completion
FY _____	FY _____	FY _____	Bal _____	\$ _____	\$ _____	\$ _____	\$ _____
\$ _____	\$ _____	\$ _____	\$ _____				
15. Impact if Change is Not Made							
16. Originator _____ Date _____							
17. Disposition of Change if Not Approved <input type="checkbox"/> Disapproved <input type="checkbox"/> Deferred By _____ Date _____							
18. Approvals				19. Additional Approvals - Class			
Subtask Leader	Date	Project Mgmt. System Specialist	Date	Statistics Task Leader	Date		
Task Leader	Date	Project Coordinator	Date	Other	Date		
Project Manager	Date	Assistant Project Manager	Date	TSP	Date		

Hanford Environmental Dose Reconstruction Project

CHANGE CONTROL LOG

Page _____ of _____

1. Project Title		2. Project Number		3. Project Manager			
HEDR Project							
4. CRR Number	5. Class	6. Date Logged	7. Status	8. Title and Description of Change	9. Cost Impact	10. Schedule Impact	11. Comments

APPENDIX F
HEDR REPORT FORMAT



APPENDIX F

HEDR REPORT FORMAT

Till Signature Page

Battelle Title Page

Acknowledgments (optional)

Preface

The preface contains remarks that are not directly part of the subject matter of the report, but which help the reader put the material in context or alert the reader to key issues.

Include these items in the preface:

- HEDR Project objectives.

Use a statement like this: The primary objective of the Hanford Environmental Dose Reconstruction (HEDR) Project is to develop estimates of the radiation doses that populations and individuals could have received from Hanford Site operations since 1944, with descriptions of the uncertainties inherent in such estimates. A secondary objective is to make project documentation (project reports and referenced documents) available to the public. An independent Technical Steering Panel directs the project, which is conducted by Battelle staff from the Pacific Northwest Laboratory.

- Status of project/previous related work/how this work fits in.

Describe decisions being supported

(*Abstract - only needed if summary is more than two pages. Abstract is one page max, description of what the report contains, sort of a mini-summary.)

Summary

Try to keep to 2 pages. If more than 2 pages, add an abstract.* The summary includes these elements:

Introduction
Scope of Work
Technical Approach
Results
Recommendations

Contents, including lists of tables and figures

1.0 Introduction

Background to Work Being Described
Purpose
Scope

Hanford facilities involved
Radionuclides/source terms
Time periods
Area/domain
Specific individuals
Special populations
Lifestyle/food habits
Agricultural considerations
Environmental monitoring data
Pathways and dosimetry

Preview of report

2.0 Technical Approach

Data Requirements
Screening Calculations
Modeling and Computer codes
Sensitivity/Uncertainty Analysis
Statistical Analysis

3.0 QA and Data Quality Objectives Achievement

4.0 Results

5.0 Conclusions

6.0 Recommendations for expansion or extension of work

Include results of decision analysis, if one was done.

7.0 References

Appendixes

Distribution List

APPENDIX G

HEDR PROJECT ACTION TRACKING SYSTEM



HEDR Project Action Tracking System Input/Change Sheet

Task # _____ Work Order # _____ QA Level _____

ATS # _____ Entry Date _____

Title _____

Action _____

Product for Delivery _____

Internal or External Delivery _____

Assigned By _____ Date Assigned _____

Person Responsible _____ Internal Due Date _____

Reviewer _____ Date Due to Client _____

How Assigned _____ Date Delivered _____

Document Reference _____ File number _____

Comments _____

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