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ENGINEERING CHANGE NOTICE

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1. ECN **602604**

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2. ECN Category (mark one) Supplemental <input type="checkbox"/> Direct Revision <input checked="" type="checkbox"/> Change ECN <input type="checkbox"/> Temporary <input type="checkbox"/> Standby <input type="checkbox"/> Supersedeure <input type="checkbox"/> Cancel/Void <input type="checkbox"/>	3. Originator's Name, Organization, MSIN, and Telephone No. B. A. Williams, RCRA Geohydrology, H6-06, 376-3416		4. Date 09/17/93
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12. Description of Change
 Document WHC-SD-EN-PMP-001, Rev. 0, revised to Rev. 1. This revision describes changes to the actual work practices of the RCRA Groundwater Monitoring Program. The changes were made to improve the management utilization of manpower and funding resource to the program.



13a. Justification (mark one) Criteria Change <input type="checkbox"/> As-Found <input checked="" type="checkbox"/>	Design Improvement <input type="checkbox"/> Const. Error/Omission <input type="checkbox"/>	Environmental <input type="checkbox"/> Design Error/Omission <input type="checkbox"/>
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13b. Justification Details

14. Distribution (include name, MSIN, and no. of copies) See attached.	RELEASE STAMP OFFICIAL RELEASE (11) BY WHC DATE SEP 24 1993 <i>Station # 12</i>
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15. Design Verification Required <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	16. Cost Impact <table style="width: 100%;"> <tr> <th style="text-align: center;">ENGINEERING</th> <th style="text-align: center;">CONSTRUCTION</th> </tr> <tr> <td>Additional <input type="checkbox"/> \$</td> <td>Additional <input type="checkbox"/> \$</td> </tr> <tr> <td>Savings <input type="checkbox"/> \$</td> <td>Savings <input type="checkbox"/> \$</td> </tr> </table>	ENGINEERING	CONSTRUCTION	Additional <input type="checkbox"/> \$	Additional <input type="checkbox"/> \$	Savings <input type="checkbox"/> \$	Savings <input type="checkbox"/> \$	17. Schedule Impact (days) Improvement <input type="checkbox"/> Delay <input type="checkbox"/>
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18. Change Impact Review: Indicate the related documents (other than the engineering documents identified on Side 1) that will be affected by the change described in Block 12. Enter the affected document number in Block 19.

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Functional Design Criteria <input type="checkbox"/>	Stress/Design Report <input type="checkbox"/>	Health Physics Procedure <input type="checkbox"/>
Operating Specification <input type="checkbox"/>	Interface Control Drawing <input type="checkbox"/>	Spares Multiple Unit Listing <input type="checkbox"/>
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Conceptual Design Report <input type="checkbox"/>	Installation Procedure <input type="checkbox"/>	Component Index <input type="checkbox"/>
Equipment Spec. <input type="checkbox"/>	Maintenance Procedure <input type="checkbox"/>	ASME Coded Item <input type="checkbox"/>
Const. Spec. <input type="checkbox"/>	Engineering Procedure <input type="checkbox"/>	Human Factor Consideration <input type="checkbox"/>
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Safety Equipment List <input type="checkbox"/>	Cell Arrangement Drawing <input type="checkbox"/>	Process Flow Chart <input type="checkbox"/>
Radiation Work Permit <input type="checkbox"/>	Essential Material Specification <input type="checkbox"/>	Purchase Requisition <input type="checkbox"/>
Environmental Impact Statement <input type="checkbox"/>	Fac. Proc. Samp. Schedule <input type="checkbox"/>	<input type="checkbox"/>
Environmental Report <input type="checkbox"/>	Inspection Plan <input type="checkbox"/>	<input type="checkbox"/>
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Cog Engineer B. A. Williams	9/23/93	PE	_____
Cog. Mgr. R.L. Jackson	9/23/93	QA	_____
QA	_____	Safety	_____
Safety	_____	Design	_____
Security	_____	Environ.	_____
Environ.	_____	Other	_____
Projects/Programs	_____		_____
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Facilities Operations	_____	DEPARTMENT OF ENERGY M. J. Furman ***	_____
Restoration & Remediation	_____	Signature or Letter No.	_____
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7. Abstract

9/24/93 N. Solis

This Project Management Plan (PMP) describes the management system used by the Geosciences Function of the Environmental Division of Westinghouse Hanford Company to manage Resource Conservation and Recovery Act (RCRA) groundwater monitoring on the Hanford Site. The activities controlled by this PMP included monitoring, well network design and installation, analysis and interpretation of monitoring well data, documentation, and reporting of monitoring and characterization results of the Hanford Site facilities falling under the authority of the RCRA.

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1.0 INTRODUCTION

This Project Management Plan (PMP) describes the management system used by the Geosciences Function of the Environmental Division to control groundwater monitoring activities at Hanford Site facilities that are under the authority of the Resource Conservation and Recovery Act (RCRA). The activities controlled by this PMP include the following:

- Supporting RCRA facility hydrogeologic characterization and monitoring design
- Supporting RCRA well installation, logging, and testing
- Monitoring of groundwater quality and groundwater levels
- Ensuring that groundwater monitoring is conducted in a manner consistent with the requirements of state and federal regulations, permitting documents, and monitoring plans
- Monitoring sample collection, analysis, evaluation, and interpretation
- Planning activities, preparing documentation, and reporting results
- Supporting regulatory analyses.

The PMP describes the scope of the RCRA Groundwater Monitoring Program, defines the organizational structure and responsibilities of its participants, and describes the tracking and reporting structure.

The PMP addresses those aspects of RCRA groundwater monitoring that are common to all facilities. Descriptions of facility-specific monitoring activities are presented in groundwater monitoring plans (GWMP) and sampling and analysis plans (SAP). Cost and schedule information for the RCRA Groundwater Monitoring Program is presented in cost account plans. Modifications to this PMP shall be made in accordance with Westinghouse Hanford Company (WHC) (1987a).

2.0 PROJECT DESCRIPTION

The RCRA Groundwater Monitoring Program supports the U.S. Department of Energy, Richland Operations Office (DOE-RL) *Hanford Site Groundwater Protection Management Program* (DOE-RL 1989) by monitoring groundwater quality and aquifer conditions (e.g., water levels) at RCRA facilities on the Hanford Site. The applicable regulatory requirements and the overall scope and strategy of the program are described in the program documentation (DOE-RL 1989). Specific criteria for RCRA monitoring activities are specified in the quality assurance project plan (QAPP) (WHC 1990b). All work under this PMP will be performed in accordance with the requirements of WHC *Environmental Investigations and Site Characterization Manual* (WHC 1988a), and the *Environmental Engineering and Geotechnology Function Procedures* (WHC 1992).

A process flow diagram for the RCRA Groundwater Monitoring Program is shown in Figure 1. This diagram summarizes the overall process of implementing the program. The RCRA Groundwater Monitoring Program has four primary components that are reflected both in the process flow diagram and in the organizational structure discussed in Section 3.0. These are: (1) the planning and coordination required at each RCRA facility to develop and implement a groundwater monitoring plan, (2) field support for site characterization, aquifer testing, and installation of the monitoring well network as described in the groundwater monitoring plan, (3) implementing groundwater sample collection, data management, data analysis and evaluation, and support to regulatory permitting, and (4) well maintenance, remediation, and decommissioning.

Figure 1 shows the regulatory and programmatic interfaces with other environmental planning activities, as well as the major components of the RCRA groundwater monitoring program. Information needs, driven by the regulations to support facility compliance, are derived from the RCRA permitting process and the hydrogeologic requirements identified in DOE-RL (1989) and sub-tier plans. The groundwater monitoring plan and its sub-tier documents are the vehicles by which this information is obtained. These documents provide the justification and methodology to install the monitoring well network, implement groundwater monitoring, data analysis, and data management.

The process of installing the monitoring well network is illustrated in Figure 1. The Geosciences Function provides well location and general design information to the Environmental Projects Department, which manages well construction. The Geosciences Function manages subsurface hydrogeologic characterization during well construction activities. Groundwater sampling and analysis commences after the well is completed and accepted. The well completion data results are documented and given to the regulators in borehole completion data package reports. Groundwater sampling results, including field measurements and analytical data, are reported on a quarterly and annual basis. The evaluation and interpretation of the monitoring results are reported in periodic characterization reports, assessment reports, and annual reports to support RCRA permitting documents. During the life of the monitoring networks, the Geosciences Function monitors well performance and identifies well remediation and maintenance requirements. The Geosciences Function also performs evaluations for well decommissioning.

3.0 PROJECT ORGANIZATION AND RESPONSIBILITIES

3.1 ORGANIZATION

The organization of the RCRA Groundwater Monitoring Program is shown in Figure 2. This and other organization charts in this PMP have been designed to emphasize the titles of individuals with authority to implement the management controls described in this PMP. The interactions of these individuals are described in this section and their detailed responsibilities are described in Section 3.2.

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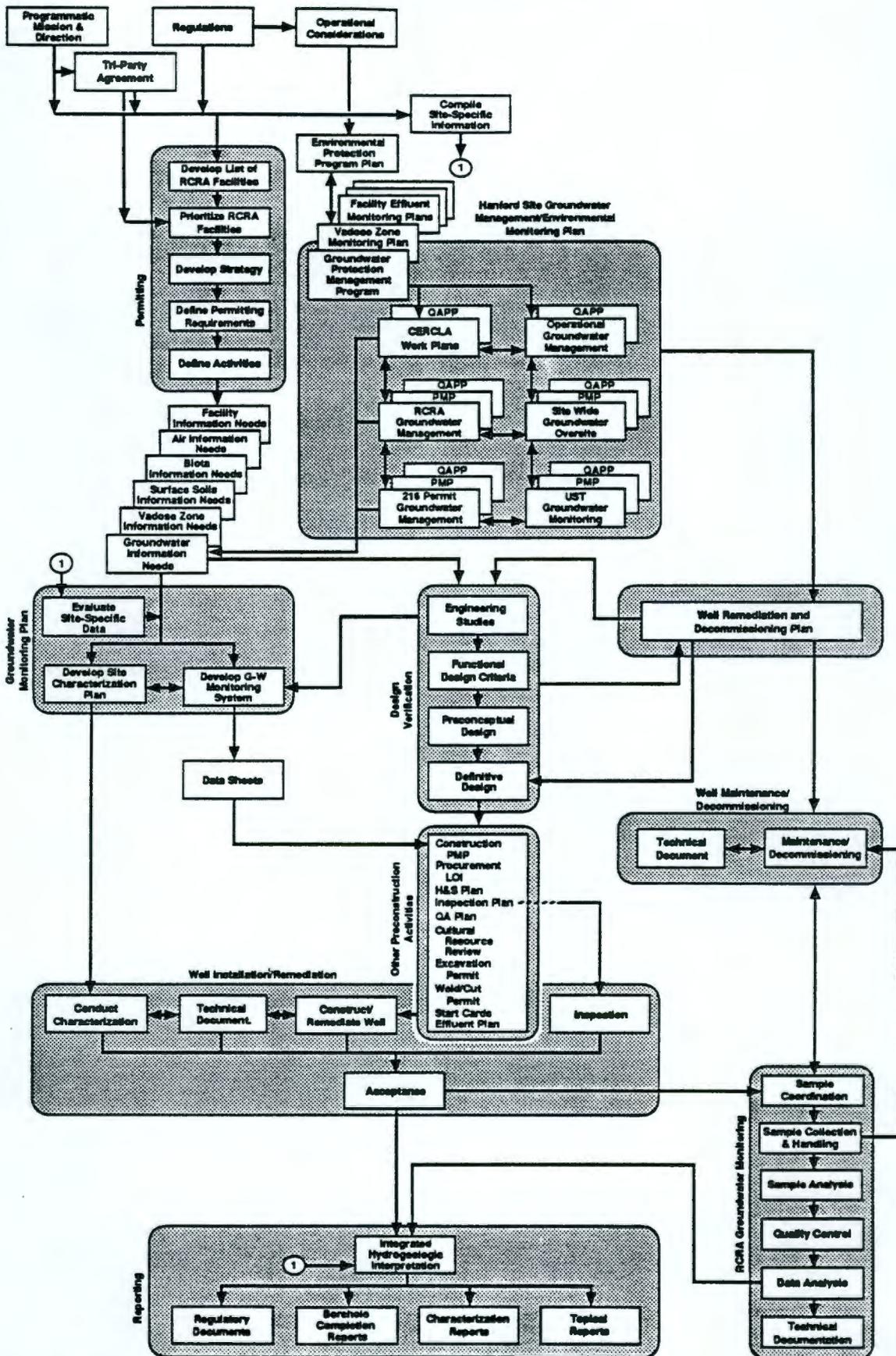
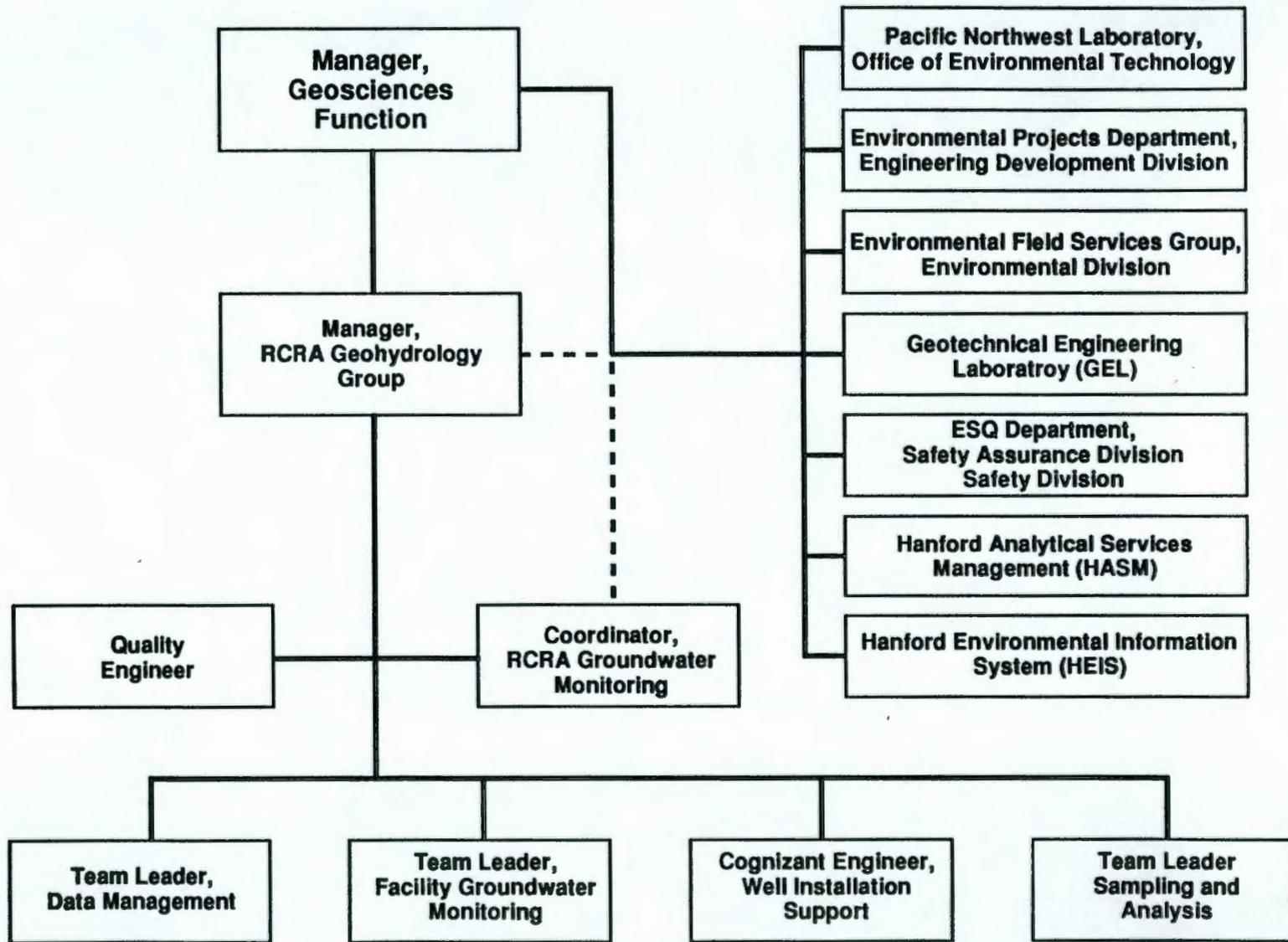


Figure 1. Hanford Site RCRA Groundwater Monitoring Program Process Flow Sheet.

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Figure 2. Organization Chart for RCRA Groundwater Monitoring.



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The RCRA Groundwater Monitoring Program is managed by the Geosciences Function. Organizational levels above the Geosciences Function are not shown on Figure 2 but are explained in WHC-CM-1-2 (WHC 1987b). Overall management responsibility for the RCRA Groundwater Monitoring Program is delegated to the RCRA Geohydrology Group Manager, who reports directly to the Geosciences Function Manager. Support services from other organizations within WHC or offsite subcontractors are obtained through the RCRA Geohydrology Group Manager or other line managers within the Geosciences Function and are coordinated on a working level within the RCRA Groundwater Monitoring Program. Technical coordination of the RCRA Groundwater Monitoring Program is delegated to the RCRA Groundwater Monitoring Coordinator. Four groups within the RCRA Groundwater Monitoring Program support the RCRA Geohydrology Group Manager, and the team leaders of those groups are responsible for the four principal aspects of the program. These groups are: (1) facility groundwater monitoring, (2) well installation support characterization, (3) groundwater sampling and analysis, and (4) data management.

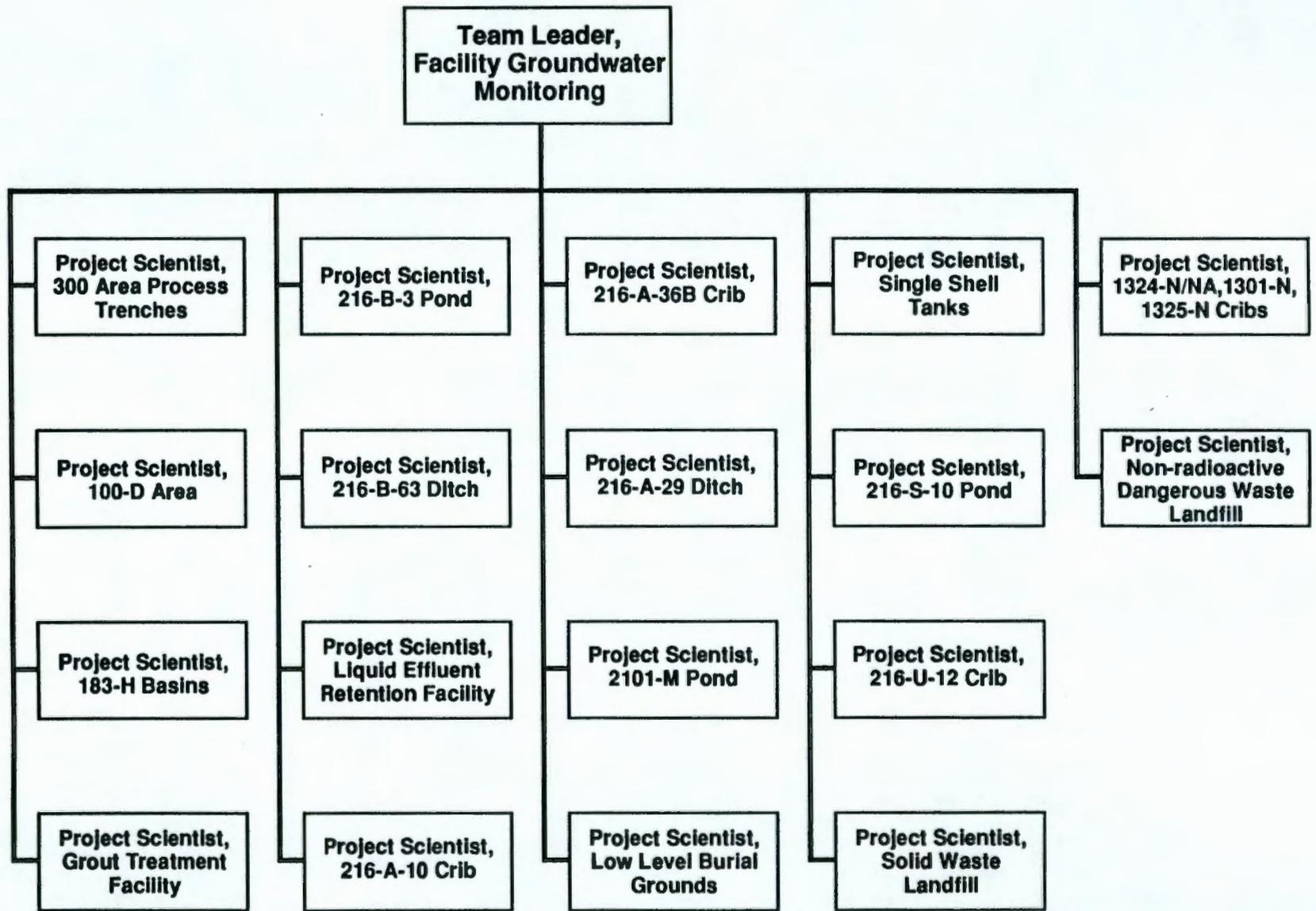
3.1.1 Facility Groundwater Monitoring

An organization chart for facility groundwater monitoring is shown in Figure 3. This organization consists of project scientists that report directly to the groundwater monitoring team leader for day-to-day direction relating to the RCRA Groundwater Monitoring Program. Each project scientist is designated responsibility for one or more of the 20 RCRA facilities and the solid waste landfill (Figure 3). In overview, the project scientist is responsible for planning, organizing, and maintaining technical review of activities at the facility that affect groundwater monitoring. The project scientist is also the primary technical interface with the facility manager, the WHC permitting function, and regulatory agencies on issues involving RCRA groundwater monitoring.

The primary responsibility of the project scientist is to prepare the GWMP and characterize the hydrogeology of the facility. The GWMP process (1) summarizes the operational history and hydrogeologic data available on the facility, (2) identifies the groundwater well and characterization needs, (3) provides technical justification for proposed well locations, (4) establishes the monitoring parameters and data quality objectives, (5) describes the sampling and analysis program, and (6) defines sampling methodologies. These plans are prepared with the support of the RCRA Groundwater Monitoring Program well installation support and groundwater sampling and analysis groups, in accordance with Washington State Department of Ecology (Ecology) requirements in Washington Administrative Code (WAC) 173-303 *Dangerous Waste Regulations* (Ecology 1991).

The groundwater monitoring plan provides the conceptual basis for monitoring network design and data analysis, and provides detailed instructions for soil and groundwater sampling. The plans serve as the basis for definitive design, construction and testing of the monitoring wells, and initiation of groundwater monitoring. The results of the testing and monitoring are provided to the project scientist who evaluates those results with the support of the other RCRA Groundwater Monitoring Program support groups, and prepares the necessary regulatory reports for the facility.

Figure 3. Organization Chart for Facility Groundwater Monitoring.



3.1.2 Well Installation Support

An organization chart for well installation support is presented in Figure 4. The well installation support team provides design, coordinates geologic and hydrologic support for well construction under the direction of the RCRA well installation cognizant engineer (cognizant engineer). The cognizant engineer provides functional design criteria, facilitates definitive design, and supports construction of the conceptual monitoring well network design developed by the project scientist. The cognizant engineer supports the project engineer of the Environmental Projects Department.

The RCRA geohydrology manager assigns a field team coordinator and records validation coordinator to coordinate day-to-day onsite support at each well. The field team coordinator and records validation coordinator report to the cognizant engineer. The field team coordinator is assisted by a wellsite geologist and hydrologist who collect and describe soil samples, communicate downhole information to the drilling team, support well completion and development, perform aquifer testing, and support sampling pump installation and testing. The field team coordinator is responsible for the coordination of other well support services including geophysical logging, soil sample radiation releases and transfer, and archival. The validation coordinator documents, tracks, validates, and distributes borehole geology and well construction information.

Procurement of drilling services, materials, and supervision of well construction is Kaiser Engineers Hanford (KEH) responsibility. In addition, KEH or its subcontractor provide health and safety monitoring services for the wellsite. Geophysical logging is provided by Pacific Northwest Laboratory (PNL), by subcontractors, or by the Geosciences Function. Special field services may be obtained as required from the Environmental Division's Environmental Field Services Group. The cognizant engineer is liaison with these organizations to facilitate well construction activities and ensures technical requirements identified by the project scientist are met.

3.1.3 Sampling and Analysis

An organization chart for sampling and analysis is presented in Figure 5. This team coordinates groundwater monitoring activities for completed groundwater wells and is under the direction of the sampling and analysis team leader. The sampling and analysis team leader coordinates sample collection and analysis, and provides data validation, evaluation, and quality control services.

The sampling and analysis activities defined under this program are administrated by the Geosciences Function, Hanford Analytical Services Management (HASM), and PNL (Office of Health and Environment [OHE] and Analytical Support Services Program [ASSP]). Currently the primary sampling and analysis support administrator is PNL (OHE and ASSP).

The sampling and analysis team leader supports the project scientist by preparing the sampling and analysis statement of work, and facilitates implementation of groundwater sampling and analysis by the laboratory contract administrator.

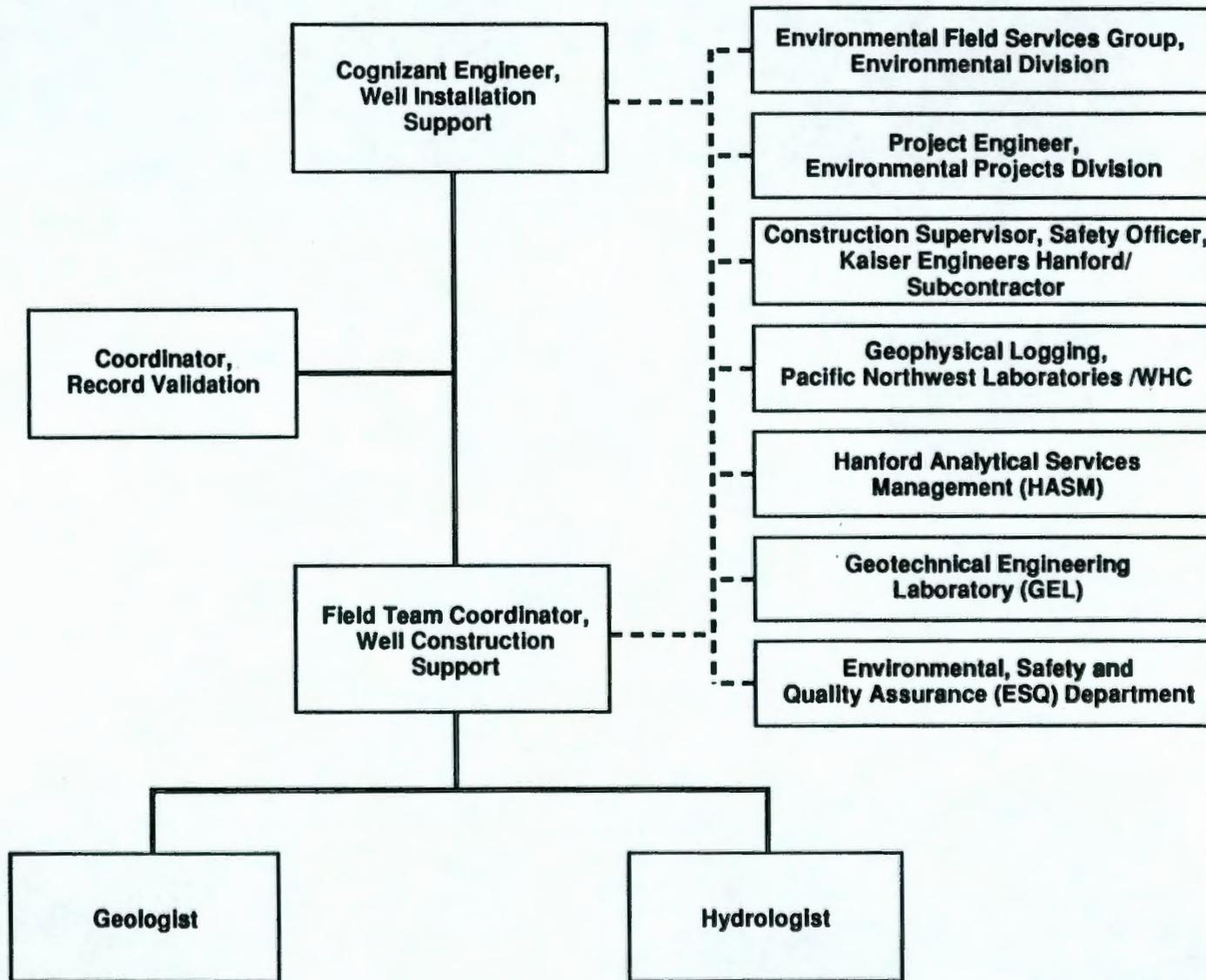


Figure 4. Organization Chart for Well Installation Support.

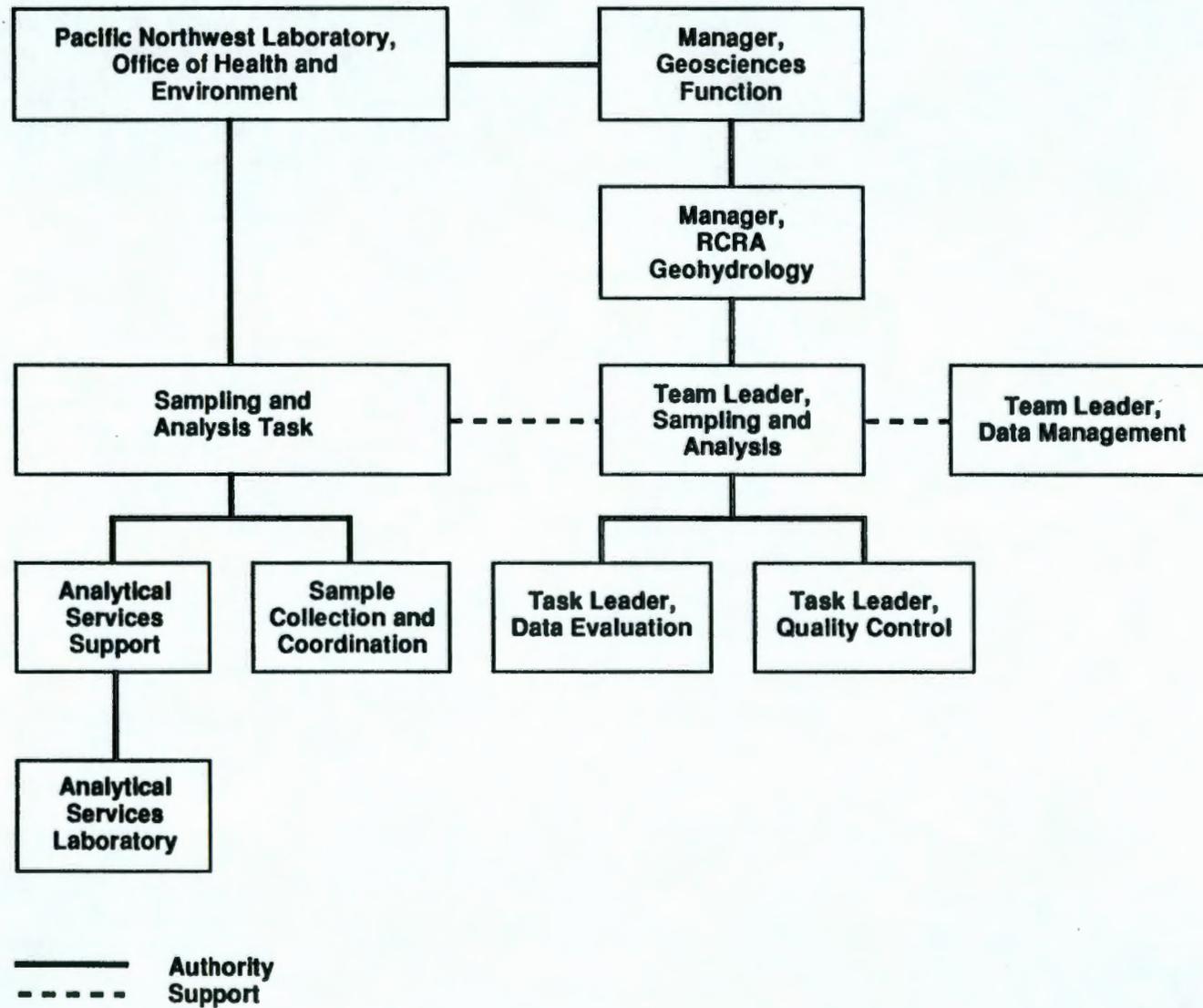


Figure 5. Organization Chart for Sampling and Analysis.

The sampling and analysis team leader is supported by team/task leaders from data management, data evaluation, and quality control. The sampling and analysis team leader supports the data management team by validating data and providing statistical support. Data validation is a process of reviewing a body of data against a set of criteria to provide assurance that the data are acceptable for their intended use.

3.1.4 Data Management

An organization chart for data management is presented in Figure 6. The data management team supports the RCRA Groundwater Monitoring Program by providing and maintaining sample analytical results (electronic database) and coordinating the RCRA document reporting process for the program.

The data management team is trustee and custodian for the RCRA groundwater monitoring analytical and water level databases. Other possible databases may include geologic data, well construction data, aquifer test data, liquid effluent monitoring data, and physical properties data.

The purpose of data management is to ensure information quality and accessibility meets program objectives as outlined in the RCRA QAPP (WHC 1990b). Data management involves the planning, organization, operation, and control of data resources, which are vital for maintaining a reliable and defensible database.

This organization also coordinates the preparation and submittal of reports required by 40 CFR 265.95 "Recordkeeping and Reporting." This effort involves organizing, scheduling, budgeting, and preparing RCRA groundwater monitoring quarterly and annual reports.

3.2 RESPONSIBILITIES

The responsibilities of key project personnel are detailed in the following sections. Personnel are assigned to project positions by the Geosciences Function Manager and/or other line managers via internal letters. These individuals will ensure that assigned personnel have the skills and training needed to accomplish their responsibilities.

3.2.1 Manager, Geosciences Function

The Geosciences Function Manager is responsible for the overall RCRA Groundwater Monitoring Program. Responsibilities include the planning and authorization of all work, management of all subcontracted activities, and coordination of technical, schedule, and budgetary performance. The Geosciences Function Manager is responsible for documenting the assignment of individuals to key roles and delegates authority as appropriate.

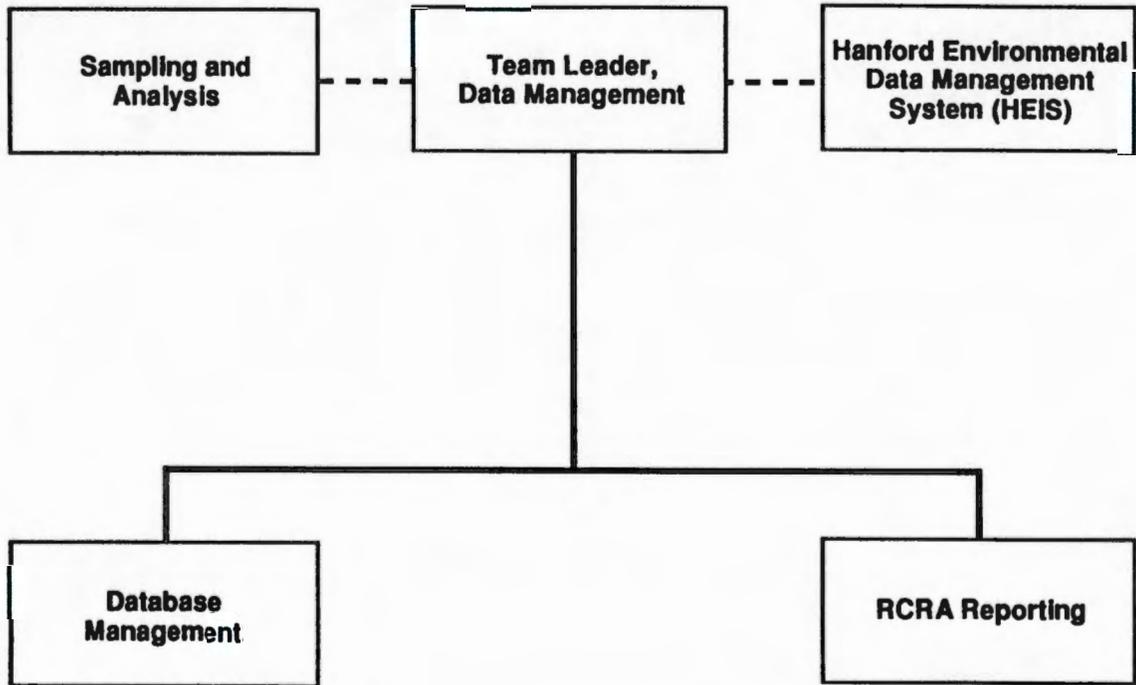


Figure 6. Organization Chart for Data Management.

3.2.2 Manager, RCRA Geohydrology Group

The RCRA Geohydrology Group Manager is responsible for implementing the RCRA Groundwater Monitoring Program in accordance with state, federal, and DOE regulations. This includes program planning, organization, scheduling, budgeting, and coordination with other supporting organizations. The RCRA Geohydrology Group Manager is responsible for all technical activities and functions as the primary regulatory liaison. This manager delegates all or part of these duties to the RCRA Groundwater Monitoring Coordinator or individual project cognizant engineers, team leaders, and project scientists as appropriate.

3.2.3 Coordinator, RCRA Groundwater Monitoring

The RCRA Groundwater Monitoring Coordinator has responsibility for technical activities within the RCRA Groundwater Monitoring Program. Responsibilities of the RCRA Groundwater Monitoring Program Coordinator include the following:

- Nominates RCRA cognizant engineer and project scientists for the RCRA Groundwater Monitoring Program and supporting personnel for approval by management
- Maintains an awareness of activities within the RCRA Groundwater Monitoring Program and facilitates cooperative work efforts within the support organizations and with offsite organizations
- Maintains an awareness of technical, cost, schedule, regulatory, and interfacing issues within the RCRA Groundwater Monitoring Program and brings significant issues to the attention of the RCRA Geohydrology Group Manager or his designee
- Provides technical guidance to RCRA groundwater monitoring personnel and to offsite organizations
- Reviews RCRA groundwater monitoring activities, staffing, and RCRA Hydrogeology Group budget plans
- Reviews technical plans, reports, and other technical documents prior to release
- Reviews changes to the technical work breakdown structure of this PMP that do not involve schedules or costs
- Prepares topical reports as required

The RCRA Groundwater Monitoring Program Coordinator reports directly to the RCRA Geohydrology Group Manager or his designee. At the RCRA Groundwater Monitoring Coordinator's discretion and with the approval of the RCRA Geohydrology Group Manager, support for RCRA groundwater monitoring activities may be obtained from subcontractors or other organizations outside the Geosciences Function.

3.2.4 Quality Engineer, Geosciences Function

The quality engineer supports the RCRA Groundwater Monitoring Program as follows:

- Coordinates self assessments of RCRA groundwater monitoring activities, including health, safety, and security issues
- Coordinates with the project scientists, cognizant engineers, and team/task leaders to identify root causes of quality problems and facilitate the implementation of corrective actions
- Interfaces with the WHC Restoration and Remediation Quality Assurance, and PNL Process Quality organizations to track and trend deficiency system documents
- Supports coordination of records handling for RCRA groundwater monitoring documents

The quality engineer reports to the RCRA Groundwater Monitoring Program Coordinator and supports the activities of the sampling and analysis quality control team leader.

3.2.5 Team Leader, Facility Groundwater Monitoring

The team leader for facility groundwater monitoring has the overall responsibility to coordinate activities of the project scientists to assure consistency and quality of work, plans, and documents. The team leader supports the RCRA Groundwater Monitoring Program as follows:

- Acts as the point of contact for the project scientists
- Reviews technical issues, schedules, working procedures and project scientists program issues
- Responsible for updating project scientists of key issues and regulatory changes that impact facility management
- Responsible for scheduling and tracking the revision of GWMPs, SAPs, assessment plans, and quarterly and annual reports
- Reviews all plan revisions, characterization reports, borehole data packages, and hydrogeologic input to permitting documents
- Maintains project scientists level of awareness through training programs and presentations from other supporting groups
- Updates management of key issues, problems, and changes in scope that impact regulatory compliance, cost, and schedule.

The facility groundwater monitoring team leader reports directly to the RCRA Geohydrology Group Manager.

3.2.6 Project Scientist, Facility Groundwater Monitoring

The project scientist for facility groundwater monitoring has day-to-day responsibility for RCRA groundwater monitoring activities at assigned RCRA facilities on the Hanford Site. Responsibilities of the project scientist include the following:

- Plans, organizes, identifies, and maintains technical review of any activities at the facility that affect groundwater monitoring
- Maintains liaison with facility managers and the permitting function
- Interprets and documents hydrogeologic conditions and monitoring activities at the facility
- Provides technical information to facility operators regarding groundwater monitoring requirements and operational practices that may affect groundwater quality
- Prepares facility monitoring well network designs
- Prepares soil sampling and testing requirements for the facility
- Prepares groundwater sampling and testing plans for the facility in accordance with Data Quality Objectives (DQO) outlined in the QAPP (WHC 1990b)
- Prepares aquifer testing plans for the facility
- Prepares facility groundwater monitoring plans, borehole completion data reports, and site characterization reports in accordance with WHC procedures
- Supports the groundwater monitoring aspects of preparing RCRA Part B permit applications and facility closure plans
- Supports the RCRA cognizant engineer by providing technical oversight to ensure well construction and testing activities are consistent with the RCRA Groundwater Monitoring Plan, QAPP (WHC 1990b), and supporting documents. Also provides well remediation requirements to ensure that well modifications are in compliance with the intended use
- Supports the sampling and analysis team leader by providing technical oversight to ensure groundwater monitoring and data analysis activities are consistent with the RCRA groundwater monitoring plan, QAPP (WHC 1990b), and supporting documents
- Provides technical support and prepares required reporting and planning documents for regulatory and permitting issues, including quarterly and annual reports
- Maintains direct technical liaison with subcontractors or other personnel providing technical support

- Interprets groundwater chemistry, groundwater elevations, and other data obtained during groundwater monitoring
- Prepares topical reports describing and interpreting the groundwater monitoring activities
- Monitors RCRA groundwater monitoring activities, prepares monthly project status reports of technical issues, and informs the team leader of any significant technical issues

The project scientist reports to the team leader.

3.2.7 Cognizant Engineer, Well Installation Support

The RCRA cognizant engineer facilitates definitive design and supports construction of the conceptual monitoring well network design prepared by the project scientist. Responsibilities of the RCRA cognizant engineer include the following:

- Provides, manages, and coordinates geologic, hydrologic and sampling support during construction and testing of RCRA groundwater monitoring wells
- Prepares and revises functional design criteria for groundwater monitoring wells and ensures that required safety and environmental protection requirements are defined
- Prepares engineering studies as required to support functional design criteria and conceptual design
- Prepares and revises well construction specifications and approves Engineering Change Notices
- Initiates well construction activities by preparing and transmitting well data sheets to WHC Projects Department
- Coordinates and provides technical oversight of subcontractors and other organizations providing well design, drilling, sampling and analysis, testing, and geophysical logging services to ensure groundwater monitoring (resource protection) well installation is in accordance with the WAC regulations
- Approves nonconformance reports relevant to the technical adequacy of the groundwater monitoring well
- Ensures that well construction variances are documented and regulators receive proper notification
- Ensures proper implementation and documentation of the requirements for well construction and testing specified by the groundwater monitoring plans, functional design criteria, QAPP (WHC 1990b), and supporting procedures

- Maintains an awareness of all activities within the well installation support group and facilitates cooperative work efforts with other RCRA groundwater monitoring groups and offsite organizations
- Provides technical support and guidance to support personnel and offsite organizations.
- Reviews and approves all well construction support technical plans, reports, and related documents
- Validates all well construction records and ensures that requested record copies are distributed, inventoried, and filed for permanent records storage and retrieval
- Transfers validated geological, hydrological, and physical and chemical data obtained during well construction to the records validation coordinator for electronic and hardcopy storage and retrieval
- Assists in preparing borehole completion data packages
- Provides technical support for regulatory and permitting issues
- Coordinates specialized engineering support from the Environmental Field Services Group, subcontractors, and the sampling and analysis team leader, with the approval of the program management
- Maintains direct technical liaison with subcontractors or other organizations providing well installation technical support
- Participates in final acceptance inspection of the monitoring wells
- Provides information to the project scientist regarding any changes required in the groundwater monitoring plan, SAP, or other RCRA groundwater monitoring documents or applicable procedures that result from final monitoring well as-built specifications
- Monitors technical activities, prepares weekly project status reports of technical issues, and informs management of any significant technical issues
- Monitors schedules and costs, prepares monthly schedule reports, and informs management of any changes in activities that may affect schedule and cost
- Delegates authority for any function to project support personnel with the approval of the management.

The RCRA cognizant engineer reports to the RCRA geohydrology group manager.

3.2.8 Field Team Coordinator, Well Installation Support

The well installation support field team coordinator provides day-to-day coordination of wellsite support activities. Responsibilities of the field team coordinator include the following:

- Directs the activities of subcontract or company geologists and hydrologists and assures that all individuals are qualified to perform fitness for use verifications on new well construction
- Provides technical guidance to support personnel and external organizations
- Provides technical direction to drill site personnel regarding those activities that may affect the ability of the well to provide groundwater samples that meet the requirements of RCRA groundwater monitoring
- Assists the project engineer on a daily basis
- Coordinates the day-to-day activities of external organizations that support RCRA groundwater monitoring activities
- Ensures that monitoring wells are designed and constructed in compliance with groundwater monitoring plans, well specifications, and applicable operating procedures
- Responsible for the technical accuracy, day-to-day scheduling, and documentation of all Geosciences Function support activities during well drilling and testing
- Reviews field logging and testing records
- Assists in staking well locations
- Ensures wellsite equipment is inventoried and distributed to the wellsite geologist and hydrologist on a timely basis
- Ensures soil sampling activities are properly coordinated with the HASM and/or PNL, and that samples are shipped promptly and with proper documentation
- Informs the cognizant engineer of any field problems.

The field team coordinator reports to the cognizant engineer.

3.2.9 Geologist

The geologist provides day-to-day wellsite support during drilling. Responsibilities of the geologist include the following:

- Collects, documents, and prepares soil samples for shipment, meeting the requirements presented in the GWMP, SAP, QAPP (WHC 1990b), and supporting procedures

- Coordinates nonroutine soil sampling during drilling with PNL or HASM following the requirements presented in the GWMP and QAPP (WHC 1990b)
- Performs and documents field tests on soil, water, and other samples following the requirements presented in the GWMP and QAPP (WHC 1990b)
- Maintains a field log by documenting well construction and testing activities and identifying any activities that may ultimately affect the ability of the well to provide groundwater samples that meet the requirements of RCRA groundwater monitoring
- Prepares borehole geologic logs.

The geologist reports directly to the field team coordinator.

3.2.10 Hydrologist

The hydrologist provides day-to-day wellsite support during well completion, development, and testing. Responsibilities of the hydrologist include the following:

- Provides technical oversight and documents installation of permanent well equipment and pumps, and directs the driller's activities during well development to ensure the requirements of the GWMP, QAPP (WHC 1990b), and supporting procedures are met
- Prepares aquifer test plans based on requirements set forth in the GWMP
- Performs and documents any required aquifer tests and coordinates the activities of test support service organizations
- Coordinates groundwater sampling during well completion, development, or testing with PNL or HASM following the requirements presented in the GWMP and QAPP (WHC 1990b)
- Assists in preparing borehole completion reports.

The hydrologist reports directly to the field team coordinator.

3.2.11 Coordinator, Records Validation

The records validation coordinator provides day-to-day records management for well installation and subsurface characterization activities. Responsibilities of the records validation coordinator include the following:

- Responsible for compilation, completeness review, and storage of hydrogeologic and well installation records as defined in WHC (1992)
- Assembles records package by well number for validation by the cognizant engineer

- Coordinates electronic data entry of validated well data into the HEIS interfacing with the data management team leader
- Distributes validated records to end users, project scientists, and other data requestors
- Supports the project scientists with the preparation of borehole completion data packages.

The records validation coordinator reports to the cognizant engineer.

3.2.12 Team Leader, Sampling and Analysis

The sampling and analysis team leader directs groundwater sampling and analysis activities following acceptance of new or existing monitoring wells. Responsibilities of the sampling and analysis team leader include the following:

- Prepares, reviews, and approves statements of work to PNL or other subcontractors for sampling and analysis activities
- Coordinates sample preparation, sample collection, field measurements, laboratory analysis, and laboratory data reporting with PNL or HASM
- Provides ongoing quality assurance (QA) review and technical evaluation of the services provided by PNL or HASM
- Coordinates data evaluation, and quality control support for groundwater sampling and analysis
- Coordinates the activities of subcontractors or other organizations providing technical support services for sampling and analysis
- Maintains an awareness of all activities within the sampling and analysis organization and facilitates cooperative work efforts with other RCRA groundwater monitoring organizations and offsite organizations
- Provides technical and administrative support and guidance to support personnel and to offsite organizations
- Reviews and approves all changes to the sampling and analysis statement of work
- Supports the interpretation and documentation of data obtained during groundwater monitoring
- Provides technical support for regulatory and permitting issues
- Provides data and results to the Project Scientist for interpretation and regulatory reporting

- Maintains direct technical liaison with subcontractors or other organizations providing technical support
- Monitors technical activities, and informs the program manager of any significant technical issues
- Monitors schedules and costs, prepares monthly schedule reports, and informs management of any significant cost and schedule changes
- Responsible for updating the RCRA GWMP QAPP (WHC 1990b).

The sampling and analysis team leader reports to the RCRA Geohydrology Group Manager.

3.2.13 Task Leader, Data Evaluation

The data evaluation task leader is responsible for data evaluation and statistical and trend analyses required for regulatory compliance. Data evaluation is a process of determining whether the data are acceptable for their intended use.

The data evaluation task leader provides support to the sampling and analysis team leader and project scientists. Responsibilities of the data evaluation task leader include the following:

- Reviews and evaluates groundwater monitoring data
- Implements statistical analyses described in the groundwater monitoring plan and provides results to the project scientist
- Provides management and technical direction to support statisticians, geochemists, and other personnel.

The data evaluation task leader supports the sampling and analysis team, the project scientists, and reports to the sampling and analysis team leader.

3.2.14 Task Leader, Quality Control

The quality control task leader is responsible for ensuring the data are collected, analyzed, and managed within the requirements of the QAPP (WHC 1990b). The results of the data evaluation and quality control reviews are provided to the project scientist for regulatory reporting.

The quality control task leader supports the sampling and analysis team leader and project scientists. Responsibilities of the quality control task leader include the following:

- Provides ongoing review of the quality of groundwater monitoring data (validation and verification) obtained from analytical laboratory and field tests, to ensure that the data quality objectives and standards established in the statement of work, GWMP, and the QAPP (WHC 1990b) are met

- Provides QA overview of the analytical laboratory and field sampling support practices and procedures
- Coordinates activities with the QA engineer for RCRA groundwater monitoring
- Supports external QA audits of sampling and analysis activities
- Provides management and technical direction to supporting quality control engineers
- Delegates authority and responsibility for any function to project support personnel.

The quality control task leader reports to the sampling and analysis team leader.

3.2.15 Team Leader, Data Management

The data management team leader is responsible for assuring that the RCRA groundwater analytical data are accurately entered, stored, and reported via electronic database media. Responsibilities of the data management team leader include the following:

- Coordinates with the sampling and analysis team leader for receiving the electronic analytical data and supporting specific data management requests
- Responds to data user needs and establishes priorities for database maintenance
- Interfaces with HEIS and voting member on the HEIS Change Control Board
- Documents the data management process and supporting software audits/surveillances
- Provides status on RCRA groundwater data availability within the database system
- Assures timely preparation of RCRA groundwater monitoring quarterly and annual reports.

The data management team leader reports to the RCRA Geohydrology Group Manager.

4.0 PROJECT MANAGEMENT AND CONTROL

4.1 WORK BREAKDOWN STRUCTURE

The work breakdown structure for the RCRA Groundwater Monitoring Program is presented in Figure 7 and on Tables 1 through 5. This work breakdown structure is designed to provide a systematic approach to technical activity planning, management and control, but may not conform to the work breakdown structure in the current Geosciences Function cost account plan. The RCRA Geohydrology Group Manager is responsible for interfacing between the two systems. All anticipated work activities have been assigned a unique numerical designation that is intended to provide a comprehensive and flexible level of activity breakdown. For purpose of planning, controlling, and monitoring individual activities, additional support levels of work breakdown detail may be added with the approval of the RCRA Geohydrology Group Manager.

4.2 COST AND SCHEDULE CONTROL

The Geosciences Function Manager or his designee(s) is the cost account manager for all Geosciences Group activities. The Westinghouse Hanford Management Control System (WHC 1988b) will be used for cost and schedule control. This system meets the requirements of DOE Order 4700.1, *Project Management System* (DOE 1987), and DOE Order 2250.1B, *Cost and Schedule Control Systems Criteria for Contract Performance Measurement* (DOE 1985). The primary goals of the Westinghouse Hanford Management Control System are to provide methods for planning, authorizing, and controlling work so that it can be completed on schedule and within budget, and to ensure that all planning and work performance activities are technically sound and in conformance with management and quality requirements.

Costs and schedules are projected based on work scope, historical costs and schedules, escalation factors, and professional judgement. Projections are provided to the Geosciences Function Manager through the cost account manager.

Performance is tracked by identifying the status of work in progress, and comparing planned costs and schedules with the actual work accomplished. A detailed description of the method is presented in the management control system. Actual and accrued costs are normally provided by WHC to the Geosciences Function Manager or designee on a monthly basis task package. Current cost and schedule information is prepared by the Geosciences Function cost account manager.

This information is then reviewed and forwarded by the cost account manager to the Environmental Waste Management/Environmental Waste Program office for analysis. Performance is tracked on a monthly basis, but more frequent tracking may be requested by the cost account manager.

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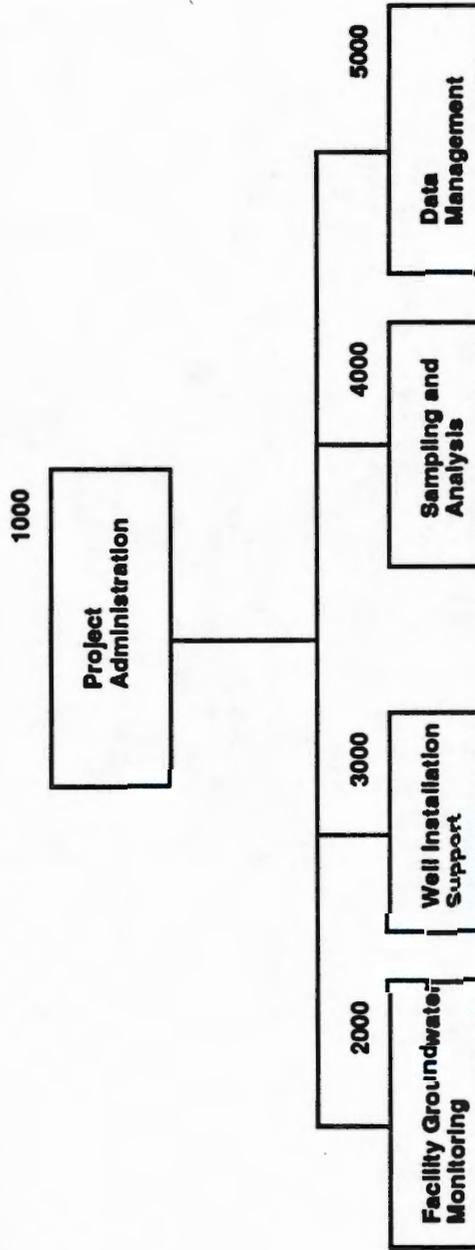


Figure 7. Work Breakdown Structure Overview.

Costs and schedules are projected and tracked by the Geosciences Function Manager or designee. The work breakdown structure will be used as a guideline for budget planning and a control tool for allocating budgets appropriate for the activity. Decision factors will include the budget, schedule, and the cost sensitivity of the risk. Projected costs and schedules are documented in the cost account plan.

Table 1. Work Breakdown Structure for Project Coordination.

1100	Project Management
1110	Technical Coordination
1120	Staffing and Budget Planning and Scheduling
1130	Project Interface Support
1140	Regulatory Support
1150	QA and Health and Safety Support
1160	Documentation and Reporting
1200	Technical Management
1210	Facility Groundwater Monitoring
1220	Well Construction Support
1230	Sampling and Analysis

Table 2. Work Breakdown Structure for Facility Groundwater Monitoring.

2100		Project Management
	2110	Technical Coordination
	2120	Staffing and Budget Planning and Scheduling
	2130	Project Interface Support
	2140	Regulatory Support
	2150	QA and Health and Safety Support
	2160	Procurement
2200		Technical Management
2210		Geologic Characterization
	2211	Stratigraphy
	2212	Structure
	2213	Soil Contamination
	2214	Well Logging Requirements
2220		Hydrogeologic Characterization
	2221	Conceptual Groundwater Models
	2222	Numerical Groundwater Models
	2223	Groundwater Use
	2224	Groundwater Quality
2230		Sources of Contamination
2240		Monitoring Well Network
	2241	Well Construction Requirements
	2242	Well Locations and Depths
2250		Soil Sampling and Testing Requirements
	2251	Sampling Methods, Locations, and Frequencies
	2252	Chemical Analytes and Methods
	2253	Statistical Data Analysis Design
2260		Groundwater Sampling and Testing Requirements
	2261	Sampling Methods, Locations, and Frequencies
	2262	Chemical Analytes and Methods
	2263	Statistical Data Analysis Design
2270		Aquifer Test Requirements
	2271	Testing Objectives, Methods, and Locations
	2272	Data Analysis Methods
2280		Well Remediation and Maintenance Requirements
2300		Documentation and Reporting
2310		Documentation
	2311	Groundwater Monitoring Plans
	2312	Sampling and Analysis Plans
	2313	Closure Plans
	2314	Site Characterization Reports
	2315	Borehole Completion Data Packages
2320		Reporting
	2321	Weekly and Monthly Management Reports
	2322	Quarterly and Annual Regulatory Reports
2330		Data Management

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Table 3. Work Breakdown Structure for Well Installation Support.

3100	Project Management
3110	Technical Coordination
3120	Staffing and Budget Planning and Scheduling
3130	Project Interface Support
3140	Regulatory Support
3150	QA and Health and Safety Support
3160	Procurement
3170	Drilling and Geophysical Support Coordination
3200	Geologic Support
3210	Geologic Support Coordination
3220	Soil Sample Collection
3230	Physical Soil Analysis Coordination
3240	Chemical Soil Analysis Coordination
3300	Borehole Geophysical Logging
3310	Borehole Geophysical Logging Support
3320	Borehole Geophysical Logging
3330	Spectral Gamma Logging
3400	Hydrologic Support
3410	Hydrologic Support Coordination
3420	Purge Water/Pre-Development Sampling and Analysis Coordination
3430	Well Completion and Development
3440	Aquifer Testing
3450	Aquifer Testing Analysis
3500	Documentation
3510	Aquifer Test Plans
3520	Hydrologic Testing Reports
3530	Data Management
3540	Field Documentation

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Table 4. Work Breakdown Structure for Sampling and Analysis.

4100	Project Management
4110	Technical Coordination
4120	Staffing and Budget Planning and Scheduling
4130	Project Interface Support
4140	Regulatory Support
4150	QA and Health and Safety Support
4160	Procurement
4170	Sample Collection and Analysis Coordination
4200	Sample Preparation (by PNL or HASM)
4210	Sample Containers and Collection Kits
4220	Materials Procurement
4230	QA Documentation
4300	Sample Collection (by PNL or HASM)
4310	Field Operations
4320	Field Vehicles and Equipment Maintenance
4330	Purge Water Disposal
4340	Radiological Monitoring
4350	QA Documentation
4400	Laboratory Analysis (by PNL or HASM)
4410	Laboratory Procurement and Coordination
4420	Laboratory Performance Oversight
4430	Sample Packaging and Shipping
4440	QA Documentation
4500	Data Evaluation
4510	Data Evaluation
4520	Statistical Data Analysis
4600	Quality Control
4610	Conformance with Plan, Procedure, and Procurement Requirements
4620	Conformance with Regulatory Requirements
4630	Internal Audits
4640	External Audit Support

Table 5. Work Breakdown Structure for Data Management.

5100	Project Management
5110	Technical Coordination
5120	Staffing and Budget Planning and Scheduling
5130	Project Interface Support
5140	Regulatory Support
5150	Procurement
5200	Data Management
5210	Data Storage and Retrieval
5220	Data Formatting and Display
5230	HEIS Database Management
5240	HEIS Database Interface
5300	Documentation
5310	Database Documentation
5320	QA Documentation
5330	Regulatory Reporting

4.3 CHANGE CONTROL

Changes impacting the scope, schedule, or cost of an activity will be documented by the Geosciences Function cost account manager. The cost account manager may directly approve minor changes of milestones or budgets that occur within a specified cost account plan, that do not involve additional costs, and that do not modify an existing contractual or procurement document. Other types of changes may require approval by the Environmental Monitoring Program Office, Procurement, Change Evaluation Board, or RL. Requests for such changes will be forwarded to the appropriate organization at the discretion of the cost account manager.

4.4 PROJECT REPORTS AND MEETINGS

Regularly scheduled project reports and meetings are used to control the technical, cost and schedule of RCRA groundwater monitoring activities, and to provide a forum for reviewing any problems that may occur. The principal reports and meetings are listed below; additional reports and meetings may be requested by the Geosciences Function Manager, the RCRA Geohydrology Group Manager, or supporting team/task leaders as required to address specific issues.

RCRA Groundwater Monitoring Project Meetings. Project personnel attend meetings to discuss plans and progress, and identify problems. Significant problems and scope changes are documented in meeting memoranda.

Well Construction Status Meetings. Well construction support personnel attend weekly meetings (during drilling) chaired by the RCRA cognizant engineer to discuss plans and progress, and identify problems. Significant problems and scope changes are documented in meeting memoranda.

RCRA Sampling and Analysis Support Meetings. Sampling and analysis support leaders attend weekly meetings to discuss progress and identify problems. Significant problems and scope changes are documented in meeting memoranda.

Management Reports. Monthly management reports to the Geosciences Function Manager, prepared by the RCRA Geohydrology Group Manager, detail groundwater monitoring status.

Performance Reports. Monthly performance reports are prepared for the Geosciences Function Manager or his designee to provide cost and schedule control information.

Quarterly Regulatory Reports. Quarterly groundwater data reports are prepared for RL by project scientists.

Annual Regulatory Reports. Reports are prepared for RL by the project scientist, summarizing and interpreting water level and sampling data collecting during the year, identifying the rate and direction of groundwater movement at the RCRA facilities, summarizing all pertinent activities at the facilities and identifying any problems, and evaluating the extent of groundwater contamination (if compliance assessment monitoring is being conducted).

4.5 QUALITY ASSURANCE

The QA requirements for this project are identified in the Quality Assurance Program Plan (WHC 1990a) and the QAPP for RCRA Groundwater Monitoring Activities (WHC 1990b). The RCRA Groundwater Monitoring QAPP describes the analytes of interest, analytical method selection, contractual quantitation limits, and precision, accuracy, representativeness, completeness, comparability (PARCC) parameters used to assess the quality of data provided as a result of facility monitoring. The QAPP also presents detailed lists of chemical analytes and technical procedures that may be used to implement RCRA groundwater monitoring at a specific facility. All activities by Geosciences Function personnel will be performed in accordance with that QAPP. Supporting activities by subcontractors or organizations outside the Geosciences Function (i.e., drilling, logging, sampling, and laboratory analysis) will be controlled by the QA requirements of that organization, or as specified in contractual or procurement documents.

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K. D. Reynolds	H6-06	X			
F. A. Ruck, III	H6-23	X			
D. R. Schell	H6-06	X			
J. S. Schmid	H6-06	X			
W. R. Thackaberry	H4-16	X			
R. R. Thompson	N1-73	X			
B. A. Williams	H6-06	X			
R. T. Winward	H4-16	X			
M. T. York	N1-73	X			
Central Files (2)	L4-08	X			
EPIC (2)	H6-08	X			

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