

**Brookhaven National Laboratory
Groundwater Protection Implementation and Integration
Plan (GPIIP)**

Revised Schedule for FY 2000

October 29, 1999

Environmental Services and Environmental Restoration Divisions

Brookhaven National Laboratory
Operated by
Brookhaven Science Associates
Upton, NY 11973

Under Contract with the United States Department of Energy
Contract Number DE-AC02-98CH10886

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**BROOKHAVEN NATIONAL LABORATORY
GROUNDWATER PROTECTION IMPLEMENTATION AND INTEGRATION PLAN
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List of Acronyms

AGS	Alternating Gradient Synchrotron
ASL	Analytical Services Laboratory
BHG	Brookhaven Group
BLIP	Brookhaven LINAC Isotope Producer
BMRR	Brookhaven Medical Research Reactor
BNL	Brookhaven National Laboratory
BSA	Brookhaven Science Associates
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CI/G/PA	Community Involvement, Government and Public Affairs Directorate
COC	Chain of Custody
CY	Calendar Year
DOE	U.S. Department of Energy
DQOs	Data Quality Objectives
EDD	Electronic Data Deliverable
EIMS	Environmental Information Management System
ENV	Environmental Monitoring Database (non-CERCLA)
ESD	Environmental Services Division
EMS	Environmental Management System
EM	Environmental Monitoring
EPA	U.S. Environmental Protection Agency
EMP	Environmental Monitoring Plan
EM-SOP	Environmental Monitoring Standard Operating Procedure
ERD	Environmental Restoration Division
ES&H	Environment, Safety and Health
FEMR	Facility Environmental Monitoring Report
FUA	Facility Use Agreement
FTE	Full Time Equivalent
FY	Fiscal Year
GPIIP	Groundwater Protection Implementation and Integration Plan
GPMP	Groundwater Protection Management Program
GPP	General Plant Project
ISG	Information Services Group (ES&HSD)
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
PEP	Process Evaluation Program
P2/Wmin	Pollution Prevention/Waste Minimization
QA	Quality Assurance
QC	Quality Control
QAPP	Quality Assurance Project plan
RCD	Radiological Controls Division
RHIC	Relativistic Heavy Ion Collider
SBMS	Standards Based Management System
SCDHS	Suffolk County Department of Health Services
SER	Site Environmental Report
SHSD	Safety and Health Services Division
RCRA	Resource Conservation and Recovery Act
UIC	Underground Injection Control
UST	Underground Storage Tank
WBS	Work Breakdown Structure
WMD	Waste Management Division

BROOKHAVEN NATIONAL LABORATORY GROUNDWATER PROTECTION IMPLEMENTATION AND INTEGRATION PLAN (GPIIP)

Revised Schedule for FY 2000

1. GROUNDWATER PROTECTION

The Brookhaven National Laboratory (BNL) Groundwater Protection Management Program (GPMP) Description, issued on December 23, 1998, outlines current and proposed activities related to protection of the sole source aquifer underlying BNL. The primary goal of the GPMP is to ensure that plans to protect, manage and restore the groundwater are fully defined, integrated and managed in an efficient, cost-effective manner that is consistent with federal, state, and local requirements.

The Groundwater Protection Implementation and Integration Plan (GPIIP) is a companion document to the GPMP.¹ The objectives of the GPIIP are to:

- Ensure that the GPMP program elements (prevention, monitoring, restoration and communication) are fully implemented, in a cost-effective and efficient manner;
- Ensure consistency and coordination of procedures, planning, projects, and systems;
- Enable valid application of data analysis and modeling of the entire groundwater flow system and contaminant transport; and,
- Accomplish timely reporting and interpretation of high quality groundwater data.

2. ROLES AND RESPONSIBILITIES

A number of BNL organizations are involved in the groundwater protection program. The following section describes the relative roles and responsibilities of these organizations, under the current organizational structure for the four key elements of the program: Prevention, Monitoring, Restoration and Communication.

Prevention:

All BNL operations have a role to play in protecting the sole source aquifer system that underlies the BNL site. All line organizations that manage chemicals and generate waste are responsible for exploring and implementing, as feasible, pollution prevention and waste minimization opportunities. They are also responsible for ensuring that their operations are in full compliance with all applicable environmental requirements.

Facility Use Agreements (FUAs) structure and template are presently being developed by a working team led by the BNL Department of Advanced Technology. They will be developed for each BNL research and support facility by departmental coordinators under a process managed by the Facilities and Operations Directorate. The FUAs will further define specific roles and responsibilities for environmental protection within each facility (see Section 3.1, below).

The *Environmental Services Division* (ESD) is responsible for:

1. Managing the Environmental Management System Project;
2. Developing environmental compliance standards and "subject area" procedures (part of the new Standards Based Management System [SBMS]);
3. Providing technical assistance to ensure compliance with regulatory requirements related to groundwater protection including: a) the National Environmental Policy Act; b) Suffolk County Article 12; c) Toxic Substances Control Act; d) Underground Injection Control; and e) National Emission Standards for Hazardous Air Pollutants;

¹ In the next version, the GPMP and the GPIIP will be combined into one document.

4. Planning for the Wellhead Protection Program;
5. Conducting facility design reviews for environmental compliance;
6. Conducting process reviews under the Phase II project (which includes field deployment of Environmental Compliance Representatives);
7. Coordinating the Pollution Prevention Program (in coordination with the Waste Management Division); and,
8. Managing the Facility Review Project.

The *Emergency Management Program* coordinates spill response.

The *Waste Management Division* (WMD) is responsible for managing hazardous waste storage facilities, developing waste management standards and SBMS subject areas, and field deployment of the Waste Management Representative program.

Monitoring:

Two BNL divisions are responsible for managing the groundwater monitoring program: the *Environmental Restoration Division* (ERD) and the ESD.

ERD is responsible for monitoring wells installed as part of BNL's Environmental Restoration (Comprehensive Environmental Response, Compensation and Liability Act [CERCLA]) Program. The Environmental Restoration wells are used to evaluate contamination associated with historical chemical and radiological releases, and evaluate the performance of remediation systems. The ERD currently monitors approximately 350 on-site and off-site wells for water quality and 650 wells for groundwater elevations.

ESD provides support services to the BNL line organizations for conducting groundwater monitoring programs near active research and support facilities with the potential to impact groundwater quality. The active facility groundwater monitoring programs have been established to satisfy DOE environmental surveillance and State permit requirements. The facility monitoring wells are designed to evaluate the potential impacts of on-going BNL operations, and to demonstrate compliance with applicable environmental regulations. The ESD monitors approximately 150 on-site wells for water quality.

ESD is also responsible for sampling associated with the environmental surveillance program (e.g., air, soils, surface water, and groundwater), and provides sampling services upon request for the ERD program. ESD sampling services include: acquisition of samples, including samples required for the site-wide monitoring program and special request samples; ensuring maintenance and calibration of sampling equipment; maintenance of supporting documentation (e.g., logbooks, chains of custody); management of interface with analytical labs; data management; and development and implementation of internal procedures related to sampling.

Samples are analyzed either by contractor laboratories, or by the *Analytical Services Laboratory* (ASL), which is part of the Radiological Control Division (RCD). For the environmental restoration program, ERD administers contracts with commercial analytical laboratories and validation services. For the ESD's environmental monitoring program, the ASL provides most analytical and validation services, and administers contracts with commercial analytical laboratories.

Currently, both ERD and ESD maintain databases containing groundwater monitoring results. The ESD database is managed by the Safety and Health Services Division (SHSD) computer support staff. Eventually, the groundwater data from the ESD monitoring program will be merged into the Environmental Information Management System (EIMS), currently managed by ERD (see Section 3.3, below).

Environmental Restoration:

ERD is responsible for the planning and implementation of the CERCLA Environmental Restoration program, which includes identification and restoration of contaminant source areas (i.e., the removal and restoration of contaminated soils, landfill capping, etc.) and the operation of groundwater remediation (treatment) systems.

Communication:

The Community Involvement, Government and Public Affairs Directorate coordinates internal and external communications, community relations, and government relations. They provide planning and technical assistance to ERD and ESD on groundwater protection program communication activities.

3. GROUNDWATER PROTECTION IMPROVEMENT AND INTEGRATION (WBS 1.0)

Although the ESD and ERD groundwater programs are coordinated to ensure completeness and prevent duplication of effort, the two programs currently maintain two separate databases, different standard operating procedures for environmental monitoring and data management, and separate sampling and analysis plans. The Groundwater Protection Implementation and Integration Plan published in April 1999 provided a description and schedule of the work needed to integrate and improve key elements of the BNL Groundwater Protection Management Program. The improvement and integration elements and FY99 accomplishments are noted below (see also Attachment 1).

- Developing Facility Use Agreements (**Partially completed during FY99**);
- Developing a Groundwater Contingency Plan to allow for the proper response to unexpected levels of groundwater contamination (**Completed during FY99**);
- Establishing an integrated environmental data management system (**Partially completed during FY99**);
- Developing a unified environmental sample Chain of Custody Form (**Completed during FY99**);
- Establishing consistent, site-wide standard operating procedures (SOPs) for environmental sampling and data handling (**Completed during FY99**);
- Establishing Data Quality Objectives (DQOs) to ensure that the rationale for the groundwater monitoring programs are well understood and defined (e.g., monitoring well placement, parameters sampled, monitoring and frequency) and that the programs for collecting the data are designed to meet applicable requirements;
- Establishing monitoring well maintenance and abandonment procedures and schedules (**Completed during FY99**);
- Establishing an integrated Quality Assurance Project Plan for the groundwater monitoring programs (**Completed during FY99**);
- Integrating and consolidating routine environmental reports, and improving the timeliness and usability of the reports (**Partially completed during FY99**);
- Improving the groundwater monitoring programs at active research and support facilities (**Partially completed during FY99**);
- Preparing a Source Water Assessment – Wellhead Protection Program Plan for active BNL potable water supply wells;
- Developing a Well Abandonment Plan for the routine assessment and abandonment of monitoring wells that are no longer required for the environmental monitoring programs (**Partially completed during FY99**);
- Improving the Underground Injection Control program to ensure that all Class V injection wells are properly inventoried, and have the required permits (**Partially completed during FY99**);
- Improving compliance with Suffolk County Article 12 requirements for Hazardous Materials Storage Areas (**Partially completed during FY99**);
- Improving communications with stakeholders on groundwater protection issues (**Partially completed during FY99**);
- Improving BNL's Pollution Prevention/Waste Minimization Program (**Partially completed during FY99**); and,
- Identification and disposal of Excess Materials (**Partially completed during FY99**).

As noted below, significant assumptions are identified that are critical to successful accomplishment of the remaining improvement and integration elements. Actions that have milestones associated with this plan have been assigned Work Breakdown Structure (WBS) numbers (see Tables 1 through 13). Milestones for actions defined under the Standards Based Management System Project, Facility Review Project, Pollution Prevention/Waste Minimization Project and the Legacy Waste Inventory and Disposition Project will be tracked separately under those projects. FY00 Milestones are provided for each GPIIP element. Any FY01 and out year deliverables and schedules will be re-baselined at the end of FY00.

3.1 STANDARDS BASED MANAGEMENT SYSTEM

Scope

As part of the Standards Based Management System (SBMS) project, a revised set of BNL Environment, Safety and Health (ES&H) standards and procedures and Facility Use Agreements (FUAs) are being developed.

Subject Areas: A number of these Laboratory-wide standards and procedures (referred to as "subject areas") will promote protection of groundwater resources. SBMS Subject Areas, which will eventually replace the existing ES&H Standards, are being developed to enable the Laboratory to accomplish its work in a timely manner, and to ensure that the work complies with applicable requirements. For example, Subject Areas have been developed under the Environmental Management System that address pollution prevention/waste minimization, spill response, UIC compliance, Suffolk County Article 12 compliance, air emissions, liquid effluents, National Environmental Policy Act, PCB/waste oil compliance, waste management, and environmental monitoring. These subject areas have been published on the BNL Web site.

Facility Use Agreements (FUA): An FUA is a formal, signed agreement between the "Landlord,"² on behalf of the Laboratory, and the head of the "Principal Occupant"³ organization. FUAs will define the operating limits and requirements for each facility at the Laboratory. Each FUA will document the respective roles, responsibilities and authorities for the Facility Manager, the Assistant Director for Facilities and Operations, and service providers with respect to all aspects of facility operations. The FUAs will establish a facility-specific program designed to ensure compliance with applicable regulatory requirements (including permits) and protect groundwater resources. Each agreement will reference environmental/groundwater protection criteria or programs that must be implemented with regard to activities being conducted in the facility. Furthermore, the FUAs will describe each department's responsibilities to design, construct and maintain their facilities in a manner that protects groundwater resources. This includes administrative and/or engineered controls, such as the development of standard operating procedures and/or operational procedures that require long-term inspection and maintenance of systems, and the construction or use of devices or structures designed to protect groundwater. The FUAs will also identify monitoring requirements associated with each facility.

Therefore, the FUAs will provide a sound technical basis for work planning and experimental safety reviews, by specifying facility design capabilities and operational limits. They will ensure that those operational limits are not inadvertently exceeded. They will serve as a reference document on the facility, rather than relying on "institutional memory." Finally, they will clarify budgetary and performance responsibilities for maintenance and operation of facility systems and equipment.

Actions and Schedule

1. Develop SBMS Subject Areas

- a. **Develop SBMS Environmental Subject Areas (SBMS Project Plan):** Draft SBMS Subject Areas for pollution prevention/waste minimization, spill response, UIC compliance, Suffolk County Article 12 compliance, air emissions, liquid effluents, National Environmental Policy Act, PCB/waste oil compliance, waste management and environmental monitoring. Conduct workshops with line organizations and finalize a complete set of environmental and waste management subject areas available for use by Environmental Management System pilot facilities (Waste Management Division, RHIC and the Reactor Division).

Deliverable: Develop approved set of final draft "Environmental" Subject Areas.

Status: **COMPLETED** - April 1, 1999

² For the purposes of the FUA, the "Landlord" is the Deputy Director of Operations, representing the Lab Director.

³ The "Principal Occupant" is the BNL organization using the majority of occupied space in the facility.

- b. **Finalize Environmental Subject Areas (SBMS Project Plan):** Finalize Environmental Subject Areas and make them effective Lab-wide. As part of a Laboratory-wide roll-out, communicate any changes in requirements.

Deliverable: Publish approved set of “Environmental” Subject Areas on the web.

Status: **COMPLETED** - August 1, 1999

2. Develop Facility Use Agreements

- a. **FUA Planning and Pilots (SBMS Project Plan):** Develop and define subject elements and requirements for the BNL FUAs, including environmental protection programs. Conduct initial FUA pilot exercises for several BNL facilities (parts of the AGS complex and Building 815), and develop a schedule for completing critical FUAs at “high priority” BNL facilities. Complete “Standard Form” templates for ease of implementation.

Deliverables: Finalize FUA criteria, complete pilot FUA exercises, and identify high priority facilities.

Status: **COMPLETED** by June 30, 1999

- b. **Develop FUAs for high priority facilities (SBMS Project Plan):**

Deliverables: Finalize and implement FUAs for high priority facilities.

Start Date: May 1, 1999

Completion Date: April 1, 2000

- c. **Develop FUAs for remaining (lower priority) facilities (SBMS Project Plan):**

Deliverables: Finalize and implement FUAs for remaining facilities.

Start Date: April 1, 2000

Completion Date: October 1, 2000

FY 2000 GPIIP Milestones

None of these actions are GPIIP Milestones. Milestones are encompassed in the SBMS Project Plan and in the BNL Critical Outcome Performance Measures.

Personnel and Funding Requirements

The resource and scheduling requirements for accomplishing the associated activities are described in the Environmental Management System Project Plan and the SBMS Project Plan.

3.2 GROUNDWATER CONTINGENCY PLAN (GPIIP WBS 1.1)

Scope

BNL developed a Groundwater Contingency Plan that describes the process used by BNL management to respond to the unexpected detection of contaminants in groundwater. The Contingency Plan will apply to wells that are owned and sampled by BNL, including BNL potable water supply wells and CERCLA and non-CERCLA groundwater monitoring wells. (Therefore, the Contingency Plan will not be applicable to off-site Safety County Department of Health Services [SCDHS] sentinel wells monitoring Suffolk County Water Authority supply well fields.)

The Contingency Plan establishes a response protocol when validated groundwater monitoring results exceed certain levels. This plan will not be initiated if: 1) data is consistent with background or historical levels, or 2) quality control (QC) samples demonstrate that the result was from analytical lab contamination. Implementation of the plan will be triggered when:

- Results exceed levels that historical data and/or analysis show are expected as a result of groundwater contamination (i.e., an Off-Normal event).
- Groundwater contamination is discovered that is not part of an existing plume previously identified in an annual

report or a CERCLA/RCRA activity or report (i.e., an Unusual Occurrence).

As described below, BNL will be reevaluating the Data Quality Objectives (DQOs) for all groundwater monitoring programs (GPIIP WBS 1.5). Completion of the DQO process will ensure that the quality and type of groundwater data are sufficient for groundwater contingency planning.

Actions and Schedule

1. **Prepare Preliminary Draft Plan (GPIIP WBS 1.1.1):** Prepare a preliminary draft Groundwater Contingency Plan that provides a step-by-step procedure for responding to unexpected levels of contamination. Provide the draft to BNL management and DOE-Brookhaven Group (BHG) for review and comment.

Deliverable: Preliminary Draft of Groundwater Contingency Plan

Status: **COMPLETED** by February 8, 1999

2. **Prepare Final Draft Plan (GPIIP WBS 1.1.2):** Incorporate comments, and prepare final draft of the Groundwater Contingency Plan. Conduct a tabletop exercise with DOE-BHG to test the plan under several scenarios.

Deliverable: Final Draft of Groundwater Contingency Plan, conduct tabletop exercise to test plan.

Status: **COMPLETED** by July 15, 1999

3. **Prepare Final Plan (GPIIP WBS 1.1.3):** Incorporate comments and finalize Groundwater Contingency Plan. Submit approved Plan to DOE-BHG for final comments.

Deliverable: Final Groundwater Contingency Plan to DOE.

Status: **COMPLETED** July 15, 1999

4. **Final Plan (GPIIP WBS 1.1.4):** Incorporate DOE comments and finalize Groundwater Contingency Plan. Submit approved plan to DOE-BHG, and implement plan.

Deliverable: Final Groundwater Contingency Plan to DOE.

Status: **COMPLETED** September 1, 1999

5. **Brief Integration Council (GPIIP WBS 1.1.5):** Prepare an Issue and Decision Paper. Brief the BNL Integration Council on the Groundwater Contingency Plan.

Deliverable: Prepare an Issue and Decision Paper. Brief the BNL Integration Council.

Start Date: October 1, 1999

Completion Date: January 1, 1999

6. **Prepare SBMS Subject Area (WBS 1.1.6):** Develop and issue a Groundwater Contingency Subject Area.

Deliverable: Issue Groundwater Contingency Subject Area.

Start Date: December 1, 1999

Completion Date: May 1, 2000

FY 2000 GPIIP Milestones

Prepare an Issue and Decision Paper.

Brief the BNL Integration Council.

Prepare Groundwater Contingency Plan (SBMS) Subject Area

Personnel and Funding Requirements

Table 1 provides information on personnel responsible for implementing this work, an estimate of the labor required and project milestones. No additional personnel or funding will be required to Prepare an Issue and Decision Paper, to brief the BNL Integration Council, or to prepare the Groundwater Contingency Subject Area.

3.3 DATA MANAGEMENT (GPIIP WBS 1.2)

Scope

The scope of this task includes integration of BNL groundwater data from all data sources, and cradle-to-grave data management procedures for these data. However, this effort must also be placed in the context of BNL's commitment to integrate data management for all environmental media (Response to October 1998 DOE-EH Follow-up Audit). The scope of the groundwater data management task must therefore also encompass subtasks that bear directly on future integration requirements.

In order successfully to integrate environmental data management, it will be necessary to first "dis-integrate" the databases for the ESD Field Sampling Team, the RCD Analytical Services Laboratory (ASL), and the SHSD environmental monitoring (ENV) into independent entities. These elements are currently linked through ENV and various data-handing procedures. This will allow them to develop different procedures and tracking mechanisms for environmental and non-environmental samples and individually to communicate directly with the ERD Environmental Information Management System (EIMS).

Because extensive changes to existing database structures and data management procedures in ERD, SHSD, ESD, and ASL will be required, failure to consider these requirements early in the planning process would result in an integration effort that was less efficient and less effective. A modified EIMS has been selected as the core database to first contain all groundwater data, and to eventually contain all environmental data.

Actions and Schedules

1. Develop an integrated environmental database for BNL (GPIIP WBS 1.2.1)

- a. Establish a clear definition of which data are to be handled as environmental data and communicate this definition to data (sample) generators as well as to samplers, the ASL, and data management personnel (GPIIP WBS 1.2.1.1)

Deliverable: A detailed definition of the environmental data to be included in integration activities will be provided in writing to EIMS and ENV database managers, the ASL manager, and the ESD Field Sampling Team leader.

Status: COMPLETED March 12, 1999

- b. Establish the ERD EIMS as the direct repository for all current BNL groundwater data (GPIIP WBS 1.2.1.2):

- Resolve existing Site ID conflicts and implement single ID convention.
- Deliver all analytical results for groundwater data to ERD in the format specified for the EIMS.
- Create temporary views as needed into ENV for EIMS to provide 1998 data to the Groundwater Monitoring Report and the Site Environmental Report (to be removed after data are migrated into EIMS).
- Implement new Chain of Custody forms (see Sec. 3.4) and direct all Chain-of-Custody (COC) forms for groundwater samples to ERD for input into the ERD Sample Tracking System.

Deliverable: Establish the ERD EIMS as the direct repository for all BNL groundwater data; ENV ceases to function as an active database for current groundwater data.

Start Date: March 1, 1999

Completion Date: December 31, 1999

c. Establish direct access to EIMS groundwater data for all authorized users (GPIIP WBS 1.2.1.3):

- Create auxiliary field forms for each entity (EIMS, ASL) to accompany the new COC form.
- Develop and implement a mechanism for entering field data (e.g., pH, conductivity) into the EIMS.
- Port ERD Query Tool onto the Web.
- Provide reporting mechanism to facilities for Facility Monitoring groundwater data (quarterly or semi-annual).

Deliverable: An integrated set of database tables, programs, and applications that permit current groundwater sampling, analytical and field data to be automatically stored in the EIMS and accessed by end-users in participating Divisions and Departments.

Start Date: September 1, 1999

Completion Date: March 31, 2000

d. Establish the ERD EIMS as the direct repository for data for all BNL environmental media (GPIIP WBS 1.2.1.4):

Deliverables: All environmental data as defined in GPIIP WBS 1.2.1 are covered by the same data management procedures as groundwater data and are stored in the EIMS; similar tools provide data access.

Start Date: September 1, 1999

Completion Date: June 30, 2000

e. Establish the ERD EIMS as the sole repository for all BNL environmental data (GPIIP WBS 1.2.1.5):

- Develop temporal and quality assurance criteria for pre-1998 groundwater data into BNL EIMS.
- Migrate pre-1998 groundwater data from ENV to BNL EIMS
- Develop criteria for migrating other historical environmental data into BNL EIMS.
- Migrate other historical environmental data from ENV to BNL EIMS.
- Document remaining data and archive.

Deliverables: All environmental data meeting a set of temporal and quality assurance criteria are stored in the EIMS. Other data are documented and archived.

Start Date: March 15, 2000

Completion Date: September 30, 2001

Assumptions:

No major changes in scope or schedule of other projects will impinge on the priority of these activities.

DOE Y2K Configuration Management requirements will not impose restrictions on changes to the EIMS, and will not interfere with the planned implementation schedule.

All affected divisions (ERD, EMD, RCD-ASL, and SHSD) will be fully staffed (vacant positions will be filled), and funding has been allocated for contractor support as necessary to meet schedules.

Funding will be available for software upgrades required to deploy applications.

All analytical data will be in the required EDD format.

Existing sampling, analysis, and data management procedures will be followed

Bar coding of samples will not be done.

FY 2000 GPIIP Milestones

- Establish the ERD EIMS as the direct repository for all BNL groundwater data; ENV ceases to function as an active database for current groundwater data.
- An integrated set of database tables, programs, and applications that permit current groundwater sampling and analytical data to be automatically stored in the EIMS and accessed by end-users in participating Divisions and Departments.
- All current environmental data as defined in GPIIP WBS 1.2.1 are covered by the same data management procedures as groundwater data and are stored in the EIMS; similar tools provide data access.

Personnel and Funding Requirements

Table 2 provides information on the personnel responsible for implementing this work, an estimate of the labor required and project milestones. The resources needed to complete the task of integrating the environmental databases are estimated at approximately 700 person hours. Personnel include: ENV database administrator, ERD database analyst/administrator, ERD data coordinator, ERD GIS analyst, ASL Manager, and ERD data entry.

3.4 CHAIN OF CUSTODY FORM INTEGRATION (GPIIP WBS 1.3)

Scope

Chain of Custody (COC) forms are used to document the unbroken possession (i.e., custody) of environmental samples from the time of collection until the samples are delivered to an analytical laboratory. The forms are also used to provide the analytical laboratory with information regarding the type(s) of analysis required for each sample. Currently, the ESD and ERD are using two different COC forms. The scope of this task was to develop a unified environmental sampling COC form and associated sample tracking and data management procedures that would meet the requirements of the ERD and ESD environmental monitoring programs. The unified COC form is applicable to both the ERD Oracle Database (EIMS) and the RCD's Analytical Service Laboratory (ASL) billing systems. The ASL performs all of its operations (for radionuclide and chemical analyses) using Excel spreadsheets. ASL data are routinely uploaded to the ESD's Environmental (ENV) Monitoring Oracle database that is managed and maintained by the S&HSD's Information Services Group (ISG). ERD-EIMS uses a similar, but not identical, Oracle database platform.

The newly developed form will serve as the 'official' BNL COC document that would accompany samples sent either to the ASL (for in-house analyses) or to off-site contractor laboratories. The present ASL database will continue to exist because it is associated with the ASL's billing/charge-back mechanism, and because a permanent database is required for all Facility Support (FS) data generated by either the ASL or off-site laboratories. FS samples are not considered "environmental."

The COC form is also acceptable to off-site analytical laboratories that might receive samples for analysis. Issues addressed during the development process included:

- Both environmental soil and water data will reside in the EIMS along with QA/QC data;
- Every sample will be assigned a Unique Identification (UID) Number that would appear on the COC. The existing BNL grid ID system will be used to describe the location of the sample;
- A "Field Sheet" will be developed that would be attached to the COC form. The sheet will include all water quality parameters measured in the field during sampling activities (i.e., pH, conductivity, temperature, dissolved oxygen, and turbidity). These data will then be entered into the EIMS along with the COC data;
- ERD will issue the UID number, and manage all sample "chaining" procedures. The original COC forms would be maintained by ERD;
- Bar-coding of samples will not be done at this time. It is not compatible with both ASL and ERD systems; and,
- If sampling is being performed by the ESD Field Sampling Team, then there is a provision for ESD to bill the end-user for their service by filling in the panel titled "Sample Contractor."
- Within 6 to 12 months after start of using the new COC form, evaluate whether additional modifications are needed.

Actions and Schedule

1. **New COC Development (GPIIP WBS 1.3.1):** A work group consisting of ERD, ASL and ESD personnel developed a draft BNL COC form that meets the sample tracking and custody requirements of both programs. The format of the new COC form is to satisfy both ASL and ERD needs regarding basic information required for performing a set of analyses and the effective electronic transmittal of results to both the ENV Oracle and EIMS databases.

Deliverable: Prepare Draft BNL Environmental Sample COC form.

Status: **COMPLETED** by January 19, 1999

2. **Finalize New COC (GPIIP WBS 1.3.2):** Draft COC is reviewed, finalized, and placed into use.

Deliverable: Finalized BNL Environmental Sampling COC form is approved and in use for both ESD and ERD programs.

Status: **COMPLETED** June 1, 1999

3. **Determine whether new COC form is effective or whether modifications are required (GPIIP WBS 1.3.3)**

Deliverable: If required, modify the COC form.

Start Date: June 1, 1999

Completion Date: June 1, 2000

FY 2000 GPIIP Milestones

Determine whether new COC form requires modification – make appropriate changes.

Personnel and Funding Resources

No additional funding or personnel resources required.

3.5 STANDARD OPERATING PROCEDURES (GPIIP WBS 1.4)

Scope

The scope of this effort was to establish a standard set Environmental Monitoring Standard Operating Procedures (EM-SOPs) that will be used site-wide by ESD, ERD and contractor personnel when collecting environmental samples at BNL. Development of a single set of BNL EM-SOPs was achieved by integrating current ESD and ERD procedures, and by writing new procedures. A standard format for all procedures was established, and the EM-SOPs were arranged into eight series of “common” work procedures:

1. Series 100-General Procedures;
2. Series 200-Quality Assurance;
3. Series 300-Groundwater and Potable Water;
4. Series 400-Surface Water;
5. Series 500-Air Sampling;
6. Series 600-Soil and Sediments;
7. Series 700-Fauna and Flora; and,
8. Series 800-Waste Management.

The BNL EM-SOPs are available through a controlled BNL web page.

Actions and Schedule

1. **Review existing procedures and prepare schedule (GPIIP WBS 1.4.1):** A work group consisting of ERD and ESD personnel reviewed all existing ESD and ERD environmental monitoring procedures and develop a standard

BNL EM-SOP format. They determined which procedures needed to be reformatted, modified or withdrawn, and identify new procedures that needed to be written.

Deliverables: Schedule to Integrate BNL EM-SOPs

Status: **COMPLETED** by January 19, 1999

2. **Revise procedures (GPIIP WBS 1.4.2):** Procedures were revised using a prioritized schedule. Assign EM-SOP Custodian, and establish document control procedures and Web page.

Deliverables: A unified set of BNL EM-SOPs and document control procedures.

Status: **COMPLETED** by September 30, 1999

3. **Prepare remaining (deferred) SOPs, prepare new SOPs, and modify and maintain existing SOPs (GPIIP WBS 1.4.3):** Prepare EM-SOP-107 "Daily Performance Check of Sanitary Line Monitor." New SOPs may be developed (e.g., remediation systems, Geoprobe groundwater sampling, etc.), and existing SOPs will be maintain and may be modified as necessary.

Deliverable: Prepare EM-SOP-107.

Start Date: October 1, 1999

Completion Date: September 31, 2000

FY 2000 GPIIP Milestones

EM-SOP-107 "Daily Performance Check of Sanitary Line Monitor" will be written by December 31, 1999 (level 2 milestone). (Note: EM-SOP108 "Operation of Building 900 Sanitary Line Monitor" is no longer required and has been withdrawn.) New procedures will be developed and existing SOPs will be modified, as necessary.

Personnel and Funding Requirements

No additional personnel or other resources will be required to develop new SOPs or maintain existing EM-SOPs (including web site management).

3.6 DATA QUALITY OBJECTIVES (GPIIP WBS 1.5)

Scope

Data Quality Objectives (DQOs) are the statements specifying the quality of data needed to support decisions relative to various stages of environmental surveillance or remedial actions. The DQO process is a strategic planning approach based on the Scientific Method that is used to prepare for a data collection activity. They are based upon the concept that different data uses require different levels of data quality with respect to the precision, accuracy, and completeness of the data. DQOs must be in place to ensure that the data obtained from the groundwater monitoring program are of sufficient quality, are scientifically defensible, and have the requisite levels of precision and accuracy to support any decisions regarding the assessment of potential impacts of facility operations on groundwater quality.

The US EPA (1994) developed a seven step DQO evaluation process which is intended to clarify monitoring program objectives, define data needs, and determine data precision and tolerance levels to support decision making. The seven steps are:

- 1) Describe the problem to be studied;
- 2) Identify the decision by determining questions to be answered and actions that may result;
- 3) Identify the data inputs to the decision;
- 4) Define study boundaries;
- 5) Develop a decision rule that describes the logical basis for choosing alternative actions;
- 6) Specify tolerable limits on decision errors; and,
- 7) Optimize the data collection process design by evaluating information gathered during steps 1 through 6.

Although most BNL sampling and analysis plans satisfy a number of these DQO steps, a more rigorous facility-by-facility (or plume-by-plume) review should be performed to document appropriate decision rules and decision errors for

the BNL groundwater surveillance program. This will ensure that the rationale for well placement, sampling parameters and frequency, and well abandonment is properly defined, and that the system is optimized. One of the decision criteria for the DQO process will be to ensure that the quality and type of data collected are sufficient for Groundwater Contingency Planning (see GPIIP WBS 1.1)

Actions and Schedule

1. Develop site-wide DQO decision framework (GPIIP WBS 1.5.1)

- 1.1. Identify decisions that groundwater data are needed to support, associated with each component of the site-wide integrated monitoring program – e.g., active facility monitoring, plume tracking and remediation, background well monitoring, etc.
- 1.2. Develop a complete list of DQOs that will be eventually developed.
- 1.3. Develop strawman decision logic diagram linking the components of the program based on GPMP, Groundwater Contingency Plan, and building on work done at other DOE sites (including the Hanford site-wide DQO). (The decision logic will address the detection of new contaminant sources, contaminant levels exceeding thresholds, contaminant trends going up or down.)
- 1.4. Meeting to discuss and complete framework.
- 1.5. Document framework and confirm path forward for project.

Deliverables: Consensus between BNL and DOE on a format for the DQO framework and level of detail for environmental monitoring programs. Use one of the Environmental Restoration Program's groundwater monitoring programs as a first example (i.e., pilot DQO).

Start Date: January 1, 2000.

Completion Date: May 1, 2000.

Assumptions: Funding of contractor support is not identified. This action cannot be accomplished within the proposed time frame unless work schedules of existing ERD and ESD project management staff is reprioritized.

2. Obtain regulatory agency concurrence on DQO format (GPIIP WBS 1.5.2)

Deliverable: Present pilot DQO to regulatory agencies and obtain their concurrence on the proposed DQO framework and level of detail.

Start Date: May 1, 2000.

Completion Date: June 1, 2000.

Assumptions: See completion date and assumptions for WBS 1.5.3

3. BNL to develop DQO Statements for groundwater monitoring programs (GPIIP WBS 1.5.3)

Deliverable: Develop DQO statements for ESD and ERD groundwater monitoring programs, and implement provisions of the DQO statements.

Start Date: May 1, 2000.

Completion Date: September 29, 2000.

Assumptions: Funding of contractor support is not identified. This action cannot be accomplished within the proposed time frame unless work schedules of existing ERD and ESD project management staff is reprioritized.

4. BNL to develop DQO's for remaining environmental monitoring programs (GPIIP WBS 1.5.4)

Deliverable: Develop DQOs for remaining ESD and ERD environmental monitoring programs.

Start Date: October 1, 2000.

Completion Date: December 31, 2000.

FY 2000 GPIIP Milestones

Completion of DQOs for groundwater monitoring programs.

Personnel and Funding Requirements

Table 5 provides information on the personnel responsible for implementing this work, an estimate of the labor required and project milestones. Considerable workload impacts to current ERD and ESD staff is expected. The FY 2000 resources needed to complete WBS 1.5.1 and 1.5.2 are estimated at approximately 875 person hours. This includes the following BNL staff hours: ERD Hydrogeologist = 170 hrs.; ERD Groundwater Project manager = 100 hrs.; ERD Operable Unit Project Managers = 170 hrs.; ERD Database Manager = 30 hrs.; ERD GIS Technician = 20 hrs.; ESD Hydrogeologist = 160 hrs.; other ESD Subject Matter Experts (SMEs) = 200 hrs.; S&HSD Database Manager = 40 hrs.; ERD Manager = 40; ESD Manager = 105 hrs.; and Assistant Director for EM = 40 hrs.

3.7 QUALITY ASSURANCE PROJECT PLAN INTEGRATION (GPIIP WBS 1.6)

Scope

An integrated BNL Quality Assurance Project Plan (QAPP) was developed for all ERD and ESD groundwater monitoring activities. The QAPP will then be expanded to include all remaining environmental monitoring activities (i.e., soil/sediment, surface water and air). The Groundwater Monitoring QAPP integrated QA Plans for the ERD and ESD groundwater monitoring programs, and included a set of BNL procedures for data verification, data validation and data usability.

Actions and Schedule

1. **Reviewed existing ERD Groundwater QAPP and developed an integration plan (GPIIP WBS 1.6.1):** A work group consisting of ERD, ESD and ASL personnel reviewed the current QAPP elements and developed an action plan for the revision and integration of the QAPP.

Deliverable: Final draft of an integrated BNL Quality Assurance Project Plan for groundwater monitoring to DOE-BHG.

Status: **COMPLETED** by April 25, 1999

2. **Expand Groundwater QAPP to include other environmental media (GPIIP WBS 1.6.2):** A work group consisting of ERD, ESD and ASL personnel will review the Groundwater QAPP elements and develop an action plan for its revision.

Deliverable: Final draft of an integrated BNL Quality Assurance Project Plan for Environmental Monitoring.

Start Date: January 1, 2000

Completion Date: May 1, 2000

FY 2000 GPIIP Milestones

Provide integrated Draft BNL Environmental Monitoring Program QAPP to DOE-BHG by May 1, 2000.

Personnel and Funding Requirements

Table 6 provides information on the personnel responsible for implementing this work, an estimate of the labor required, and project milestones. Several additional resources will be necessary in order to implement the QAPP. There will be a need for a QA/QC Manager that will require an estimated 0.5 FTE or possibly more. In addition, there will be a need for qualified QA/QC representatives to perform annual laboratory and field audits (this would include each of the contracted labs and the field sampling teams). It is estimated that the level of effort required for these audits will be on the order of at least 160 hours per year.

3.8 INTEGRATED AND IMPROVED REPORTS (GPIIP WBS 1.7)

Scope

The scope of the "Reports" Element is twofold:

1. To evaluate the potential for the consolidation of existing reports that are prepared on a routine basis, and provide a schedule for implementation; and,

2. To identify the tools or methods necessary for enhancing of the content of existing routine reports. It should be noted that consolidation should only apply when there is a clear benefit to both the author/originating organization and the end-user/audience for a given report.

Consolidation of Reports: Attachment 2 identifies all existing BNL environmental reports that are generated on a routine basis, along with their current date of submittal and the end user/audience. These reports primarily consist of remediation system performance monitoring, sitewide groundwater monitoring, the Site Environmental Report and Program Sampling Plans. Attachment 3 lists each report, and indicates how they would be consolidated, with associated milestones.

Enhancement of Report Content: A common theme for all of the routine reports is to strive for better presentation of the information for the end user. This can be accomplished in various ways, including the following:

- Early buy-in on document reformat: An example is to develop a consistent format for the quarterly remediation system reports in FY99 prior to full consolidation in FY 2000. Also, any changes from the current Site Environmental Report (SER) format should be properly planned and agreed to early on in the planning process.
- Peer review: All documents produced will be peer reviewed by other subject matter experts who have competency in the technical area, and can check the accuracy of the data. Peer reviewers are expected to focus on technical content, identify sensitive issues, and ensure consistency with related documents. The line organization (or process owner) who provided data for the report or who will be subject to the requirements or limitations in the document should also be included in the review.
- Technical writer/editor: Use of a competent technical writer/editor on most reports can enhance their readability for the audience, and enhance the overall quality of the document. Technical writers/editors can conduct final mechanical editing (i.e., grammar, punctuation, spelling), as well as substantive formatting (i.e., coherence, clarity, conciseness, organization, consistency);
- Use of 3-D visualization: This software tool should be available for presentations (at a minimum) and possibly for inclusion in certain reports.

Actions and Schedule

1. **Quarterly Reports for CERCLA Remediation Systems (GPIIP WBS 1.7.1):** These reports primarily evaluate the performance of the treatment systems in terms of operational efficiency, but also provide monitoring well data. The reports are currently submitted to DOE on a staggered basis, depending on when each system went into operation. Separate quarterly reports are also submitted for monitored natural attenuation remedy projects. It is proposed to submit them together as one report each calendar quarter. The benefits of this approach would be that end user will see significantly reduced number of reports, and the reports would use a consistent format. Challenging aspects of this initiative would be intensive up-front resources would be required. The first step of this process will be the development of a consistent format for FY99 reports, ending with a combined, single document starting with the First Quarter Report for CY 2000.

Deliverables: Combined Quarterly Reports for CERCLA Remediation Systems.

Start Date: September 30, 1999 (unified format for quarterly reports).

Completion Date: June 30, 2000 (First Quarter Report for CY 2000).

Assumptions: Regulators would agree to the concept of combined quarterly reports.

2. **Annual BNL Groundwater Monitoring Report (GPIIP WBS 1.7.2):** This report currently consists of a summary of the data from the CERCLA-related monitoring wells. It is proposed that starting with the 1999 Calendar Year (CY) report, the Groundwater Monitoring Report will include both CERCLA and the Facility Groundwater Monitoring Program groundwater data. This report would also include the annual summary of the monitoring wells/plumes associated with the remediation systems and the monitored natural attenuation remedies. Information from this report will be feed into the BNL Site Environmental Report. The report format will be modified to allow for ease in incorporation into the SER. The proposed report will provide a comprehensive summary of all BNL groundwater data to stakeholders in a timely manner.

Deliverables: Annual BNL Groundwater Monitoring Report for CY 1999

Start Date: January 1, 2000

Completion Date: June 15, 2000

Comment: BNL will evaluate the potential for completing the CY 2000 Groundwater Monitoring Report by May 15, 2001. Accelerated reporting will be contingent upon successful improvements in database management.

3. **Site Environmental Report (SER) (GPIIP WBS 1.7.3):** This report currently incorporates a summary of BNL groundwater data as well as evaluations of other environmental media to provide a comprehensive evaluation of the entire site. The SER will continue to be the most visible BNL document from the public's perspective. No additional consolidation is proposed for the SER at this time. Lessons learned from previous years' preparation of the report will be implemented.

Deliverables: CY 1998 Site Environmental Report.

Status: 1998 SER **COMPLETED** and on BNL Web site by September 1, 1999

4. **BNL Environmental Monitoring Plan (EMP) (GPIIP WBS 1.7.4):** This report, which is revised every three years and reviewed annually, covers ESD and ERD monitoring of all media as required by DOE Order 5400.1. In addition, ERD currently prepares an Annual Sampling and Analysis Plan for groundwater monitoring. Reformatting the CY 2000-2003 EMP is required to provide a more integrated approach and structure for lab-wide monitoring. Revisions to the EMP will be properly documented each year as part of the annual update. Integration of both plans as one BNL document will present a comprehensive monitoring approach for the audience, especially the regulators.

Deliverables: DOE approved BNL Environmental Monitoring Plan for CY 2000-2003.

Start Date: October 1, 1999.

Completion Date: December 31, 1999.

5. **BNL Facility Environmental Monitoring Reports (FEMRs) (GPIIP WBS 1.7.5):** These new reports will present facility-related groundwater, surface water, and air data on a semi-annual, or annual basis depending upon the sampling frequency. The ESD will prepare the first FEMR beginning in July 1999 with the RHIC Facility. The FEMRs will provide the facilities with pertinent and timely data to support their stewardship of the environment.

Deliverables: RHIC Facility Environmental Monitoring Report (first scheduled semi-annual FEMR)

Status: RHIC Report **COMPLETED** by July 1, 1999. New Waste Management Facility report completed October 26, 1999. Database integration (to EIMS) is ongoing, and database query tools are being developed to allow facilities to access data directly. A schedule for delivery of routine FEMRs will be developed.

Assumptions for all elements:

- Electronic data deliverables (EDDs) are provided in the required format.
- All data is available from the database when needed by report author(s).
- All monitoring well samples can be collected in the desired time frame.
- Sufficient analytical laboratory capacity and quality will be available in desired time frame.
- The USEPA and NYSDEC will accept the proposed report consolidation initiative, and agree that the six-month lag on the submittal of the Annual Groundwater Report (GMR) is acceptable. The GMR discusses recommendations for modification of the remediation system based on the plumes/monitoring data. Note: EPA recently indicated that the consolidation is acceptable as long as BNL agrees to identify any obvious remediation system modifications that are needed as they come up (rather than waiting until the final annual report).

FY 2000 GPIIP Milestones

- Identify facilities needing routine FERMs, then develop schedule for report preparation. Also, develop web based query tools for line organization use (see WBS 1.2)
- Prepare BNL Environmental Monitoring Plan for CY 2000-2003.
- CY 1999 SER on BNL Web site by October 1, 2000.
- Prepare integrated BNL Groundwater Monitoring Report for CY 1999.
- Combine separate CERCLA quarterly reports into single quarterly report.

Personnel and Funding Requirements

Table 7 provides information on the personnel responsible for implementing this work, an estimate of the labor required, and project milestones. Significant resources will be required to implement improvements to report formats, and to accelerate the submittal of reports. It is estimated that each ERD and ESD Project Manager will spend approximately 80 hours for each quarterly or semiannual report and 120 hours for annual reports. The ERD Groundwater Program Manager will spend approximately 120 hours per year reviewing these reports. The ERD Groundwater Monitoring Project Hydrogeologist and Support Hydrogeologist will require approximately 1,200 hours/yr and 700 hour/yr, respectively. The GIS Analyst and the Database Analyst will require approximately 1,000 hours total.

There will be an additional need for 0.25 FTE for SER project management. Additionally, 0.5 FTE of a GIS Analyst and 0.5 FTE of an Oracle Database Analyst will be needed for a period of 6 months, starting in the summer 1999. These persons are required to produce the consolidated quarterly remediation system reports (at least six systems in FY 2000). There will also be a need for a technical writer/editor periodically.

3.9 GROUNDWATER MONITORING IMPROVEMENTS PLAN (GPIIP WBS 1.8)

Scope

Extensive groundwater monitoring programs have been developed at BNL to evaluate the effectiveness of pollution prevention programs and environmental restoration. Several active facilities have inventories of hazardous or radioactive materials that could potentially create groundwater contamination problems if there were leaks in piping systems or tanks. Others have operations that create the potential for groundwater contamination by the direct activation of soils. Although groundwater quality at a number of these active facilities has already been impacted, current information indicates that the levels of contamination are either below or only slightly above applicable groundwater standards.

To supplement the existing programs, approximately 80 new monitoring wells are being installed near potential source areas within a number of active research and support facilities (see *BNL Groundwater Monitoring Improvements Plan for FY 1998 and FY 1999*).⁴ Once in place, the improved groundwater monitoring network will provide BNL with timely information related to the potential impacts, if any, that facility operations may have on groundwater quality, and on the adequacy of pollution prevention programs. If unexpected levels of contamination are detected, appropriate investigations into the source of the contamination and/or remedial or corrective measures will be taken.

Actions and Schedule

1. **Install Wells at High Priority Facilities (GPIIP WBS 1.8.1):** Installation of new groundwater monitoring wells at high priority facilities (i.e., Alternating Gradient Synchrotron, Brookhaven LINAC Isotope Producer, Relativistic Heavy Ion Collider, Brookhaven Medical Research Reactor, and Motor Pool).

Deliverables: Installation of new wells, incorporation of wells into Facility Monitoring Program, and sample collection.
Status: **COMPLETED** by May 15, 1999

2. **Install Wells at Lower Priority Facilities (GPIIP WBS 1.8.2):** Installation of new groundwater monitoring wells at lower priority facilities (i.e., Shotgun Range, Live-fire Range, Sewage Treatment Plant, Biology Department Greenhouses, Building 830, and on-site Gasoline Station).

⁴ The *Brookhaven National Laboratory Groundwater Monitoring Improvements Plan* (September 23, 1998) provides a summary review of: 1) the operational history of each facility requiring improvements in its groundwater monitoring program; 2) identification of potential contaminant source areas (e.g., underground storage tanks and beam stop areas); 3) review of the historical and current groundwater monitoring programs and available groundwater data; 4) recommendations for necessary groundwater monitoring upgrades or improvements at each facility; and, 5) a prioritized schedule for the installation of nearly 80 new wells.

Deliverables: Installation of new wells, incorporation of wells into Facility Monitoring Program, and sample collection.

Start Date: October 15, 1999

Completion Date: March 31, 2000

Assumptions: Drilling contract is in place and drilling starts by December 6, 1999

FY 2000 GPIIP Milestones

Installs all planned wells by March 31, 1999, and incorporate the new wells into Facility Monitoring Program by April 2000.

Personnel and Funding Requirements

Table 8 provides information on the personnel responsible for implementing this work, an estimate of the labor required and project milestones. No additional personnel are required. The total remaining FY 2000 effort for the ESD Hydrogeologist is approximately 140 hours. For FY 2000 and out years, it is assumed that applicable line organizations will fund groundwater sampling and analysis via charge back.

3.10 WELLHEAD PROTECTION PROGRAM FOR POTABLE SUPPLY WELLS (GPIIP WBS 1.9)

Scope

Under the Safe Drinking Water Act, states are now required to develop Source Water Assessment Programs for all sources of water that are used to supply public drinking water. The target date for conducting Source Water Assessments in New York State is CY 2000 through 2001 (NYS Source Water Assessment Program Plan, November 10, 1998 Draft). In response to these new requirements, BNL will establish a Source Water Assessment - Wellhead Protection Program for its drinking water supply wells. Wellhead protection aspects will emphasize pollution prevention as a primary means of protecting drinking water supplies. A benefit of this program will be to ensure that BNL operations are not adversely impacted due to loss of one or more supply wells from contamination. Many of the elements required to prepare the Source Water Assessment - Wellhead Protection Program Description have already been developed as part of BNL's ongoing environmental monitoring and protection programs. For example:

- 1) BNL maintains an extensive groundwater monitoring well network to ensure that known and potential contaminant source areas are assessed;
- 2) Known contaminant sources and contaminated groundwater are being remediated under the CERCLA process;
- 3) Potential source areas have either been removed, upgraded, or are scheduled to be upgraded (e.g., above ground storage tanks, underground storage tanks, leaking sewer lines, cesspools/septic tanks);
- 4) BNL currently reviews all new construction designs for potential impact to groundwater resources; and,
- 5) The BNL Regional Groundwater Model has been used to define the capture zones (or water source areas) for each potable water supply well.

Actions and Schedule

1. **Development of BNL's Source Water Assessment - Wellhead Protection Program (GPIIP WBS 1.9.1):**
Develop a draft BNL Source Water Assessment – Wellhead Protection Program description document, and provide it to DOE for review. Development will consist of six primary tasks (some of which will build on documents/information that have already been developed for other purposes):
 - Documenting the location of all BNL production and potable water wells;
 - Delineating Source Water areas for each potable supply well using the BNL Regional Groundwater Model;
 - Identifying and ranking potential and known sources of groundwater contamination;
 - Identifying suitable locations for new supply wells, including identifying areas where new supply wells should not be installed due to present groundwater contamination and the likelihood of diverting contaminant plumes toward supply wells;

- Describing existing BNL plans and programs for the control and/or remediation of known contaminant source areas, upgrading existing facilities, and incorporating engineering and operational controls for new facilities; and,
- Developing wellhead protection plans, including additional procedures needed for assessing the potential impact of new construction on groundwater quality and the use of appropriate engineering and operational controls.

Deliverable: Draft BNL Source Water Assessment - Wellhead Protection Program Description to DOE.

Start Date: October 1, 1999

Completion Date: October 1, 2000

Assumptions: ERD Groundwater Modeler will support effort by developing necessary zone of capture maps for each potable supply well.

2. **Final Plan Delivered to Regulators (GPIIP WBS 1.9.2):** Provide copies of the BNL Source Water Assessment – Wellhead Protection Program Description to the New York State Department of Health and Suffolk County Department of Health Services.

Deliverable: Provide BNL Source Water Assessment - Wellhead Protection Program Description to regulators.

Start Date: November 15, 2000

Completion Date: January 1, 2001

Assumptions: Receipt of DOE comments by November 15, 2000

FY 2000 GPIIP Milestones

Draft BNL Source Water Assessment - Wellhead Protection Program Description to DOE for review and comment.

Personnel and Funding Requirements

Table 9 provides information on personnel responsible for implementing this work, an estimate of the labor required and project milestones. No new staff is required beyond the ERD Groundwater Modeler. The estimated BNL personnel hours required to prepare the document include: ESD Project Hydrogeologist = 300 hrs; ERD Project Hydrogeologist = 40 hrs; ERD Groundwater Modeler = 100 hrs; ERD GIS Technician = 40 hrs; Plant Engineering Division Water Supply Engineer = 80 hrs; and secretarial support = 80 hrs. If the ERD Groundwater Modeler is not available to support this project, approximately \$15,000 will be required for contractor modeling support.

3.11 MONITORING WELL ABANDONMENT PLAN (GPIIP WBS 1.10)

Scope

At the present time, the BNL groundwater well inventory consists of approximately 800 groundwater monitoring wells and 20 water supply wells. Since 1991, BNL has abandoned approximately 50 inactive or damaged groundwater monitoring wells and two inactive supply wells. To standardize the methods and documentation procedures for the abandonment of wells, BNL developed a *Technical Guide for the Abandonment of Inactive Supply Wells, Injection Wells, and Monitoring Wells* (Paquette and Dorsch, 1996). As part of the GPIIP effort to integrate and standardize all site-wide environmental monitoring procedures, this guide was reformatted into the *BNL Environmental Monitoring Standard Operating Procedure 104* (EM-SOP 104). The BNL well abandonment procedure is based on industry and regulatory agency standards and is consistent with well abandonment guidelines established by the New York State Department of Environmental Conservation (NYSDEC) Region I Water Unit (NYSDEC, 1994). This abandonment procedure and associated documentation requirements will be followed for the abandonment of all BNL monitoring wells and water supply wells.

BNL developed a *Well Abandonment Plan* that provides the technical basis for the routine assessment and timely abandonment of all groundwater wells that are either damaged beyond repair, or no longer useful for groundwater sampling or groundwater elevation measurements. Abandonment of selected wells will eliminate the need for BNL to maintain the wells, avoid potential vandalism, and eliminate potential hazards created for vehicles by the wells. Currently, there are no New York State or DOE regulations requiring BNL to abandon wells. An annual evaluation of BNL groundwater wells will be conducted using these standardized criteria.

Actions and Schedule

1. **Develop a BNL Well Abandonment Plan (GPIIP WBS 1.10.1):** The Well Abandonment Plan will establish a routine evaluation schedule and the decision-making criteria for the selection and abandonment of groundwater monitoring wells that are either damaged beyond repair or of no further use to the Facility or CERCLA groundwater monitoring programs. An appendix to the plan will identify wells to be abandoned during FY 2000.

Deliverable: BNL Well Abandonment Plan with proposed wells to be abandoned during FY 2000.

Status: **COMPLETED** July 30, 1999

2. **Abandon First Set of Wells (GPIIP WBS 1.10.2):** Develop abandonment project plan for identified wells, and retain contractor services to abandon wells identified in the Well Abandonment Plan (Appendix to the plan will identify wells to be abandoned during FY 2000).

Deliverable: Abandonment of first set of wells

Start Date: November 30, 1999

Completion Date: March 31, 2000

Assumptions:

- Required funding for the abandonment of ESD program wells is available from the identified program or overhead sources. Well abandonment contract can be let by December 1, 1999. (Note: At this time, no Facility monitoring wells are scheduled (or anticipated) to be abandoned during FY 2000.)

FY 2000 GPIIP Milestones

Abandon monitoring wells identified in the Well Abandonment Plan by February 15.

Personnel and Funding Requirements

Table 10 provides information on personnel responsible for implementing this work, an estimate of the labor required and project milestones. Funding required for the abandonment of ERD monitoring wells will be included in the FY 2000 CYWP for the Environmental Restoration Program. The resources needed to complete the task of developing the Well Abandonment Plan and abandoning the first set of wells is estimated at approximately 100 person hours.

3.12 UNDERGROUND INJECTION CONTROL PROGRAM (GPIIP WBS 1.11)

Scope

The goal of the BNL Underground Injection Control (UIC) program is to prevent the discharge of contaminants that could jeopardize groundwater quality. Under the USEPA UIC Program, UIC devices are subject to inventory, sampling, analysis, and closure, if necessary. The BNL only has Class V injection wells, which are generically defined as wells used for injecting fluids, and are defined as devices that are deeper than their widest surface dimension. BNL Class V injection wells include sanitary and other wastewater disposal systems, including but not limited to drywells, cesspools, septic tanks, and leach fields. During the 1997 EPA Multi-media Audit, concerns were raised regarding the completeness of the Class V inventory on file with EPA. In November and December 1998, a revised inventory was prepared and submitted to EPA for review and evaluation, along with an area-wide permit application.

In January 1999, the Laboratory received a proposed Administrative Order from the USEPA requiring the acquisition of an area-wide permit for the continued operation of approximately 170 Class V underground injection control wells. In March, the Laboratory met with the EPA to discuss the content of the 1998 inventory and the proposed Order. EPA is seeking additional information that was not included in the original application. Consequently, the Laboratory submitted to EPA on September 28, 1999 a revised Area Permit application. Preparation of the revised application included require validation of the existing inventory, preparation of "typical" as-built diagrams for the UICs, preparation of a generic closure plan, and finalization of the permit application. In addition, in lieu of permitting, this project will close UICs that are found to be unnecessary. In total, 54 UICs are proposed for closure. In FY99, 29 UICs were abandoned under the oversight of the SCDHS and the EPA. Abandonment of additional Class V injection wells will be coordinated with the SCDHS and EPA, and SCDHS cleanup guidelines will be utilized to assess potential soil remediation requirements.

This permit process may require collection and analysis of wastewater samples from certain wastewater streams for characterization purposes. UIC devices found to pose a threat to groundwater will be addressed by closure or through the mitigation of pollutant sources. The Administrative Order was scheduled to be finalized by the EPA on or about September 30, 1999.

Actions and Schedule

1. Meet with USEPA to Review and Negotiate Specific Deliverables (GPIIP WBS 1.11.1):

Deliverables: Finalized Administrative Order

Start Date: March 11, 1999

Status: **COMPLETED**, AO signed September 29, 1999.

2. Apply for USEPA UIC Permits (GPIIP WBS 1.11.2): As per Administrative Order, the Plant Engineering and Environmental Services Divisions will prepare and submit by September 30, 1999 an Area permit for all Class V Injection wells. This project will include a validation of the current UIC inventory by a contract engineering firm, preparation of “typical” designs for the various types of UIC devices, preparation and submittal of the Area Permit, and the closure of unnecessary UICs.

Deliverables: Submit UIC Permit Application

Status: **COMPLETED** on September 28, 1999

3. Close UICs (GPIIP WBS 1.11.3): 54 UICs are proposed for permanent closure under this project, pending availability of funds.

Deliverables: Close the 54 identified UICs

Start Date: December 1998

Completion Date: September 30, 2001

Assumptions: ADS for this project is approved:

FY99 - \$300K

FY00 - \$267K

FY01 - \$263K

4. Investigate Identified Active UICs (Facility Review Project): Under the Laboratory Facility Review Project, issues associated with operational UICs will be investigated. These issues deal with alleged disposal of chemicals to cesspools, verification that prior issues have been appropriately addressed.

Deliverables: Facility Review Project – UIC Close-out Reports

Start Date: Initial investigations began FY 1998 (Continued funding has not been identified).

Completion Date: To be closed out by the end of FY02 or transitioned to either the UIC Program or the Environmental Restoration Program.

5. Investigate Identified Inactive (Legacy) UICs (Facility Review Project): The Environmental Management Directorate will investigate issues dealing with non-operational/legacy UICs. These issues include alleged disposal of chemicals to cesspools, and verification that prior issues have been appropriately addressed.

Deliverables: Facility Review Project – UIC Close-out Reports

Start Date: Initial investigations began FY 1998 (Continued funding has not been identified).

Completion Date: To be closed out by the end of FY02 or transitioned to the Environmental Restoration Program.

6. Abandon UICs (Facility Review Project): Abandon inactive (and presently active, as required) UICs.

Deliverables: UIC Closeout Reports

Start Date: Contingent upon obtaining continued funding.

Completion Date: Contingent upon obtaining continued funding.

Assumptions: A total of 54 UICs are proposed for closure under WBS 1.11.2. Additional UICs may be discovered during Facility Review investigative activities. Any additional UIC device will be addressed as they are discovered.

- 7. Implement Phase III Sanitary Upgrades Project (Plant Engineering GPP Project):** As part of this project, several UIC systems at the RHIC site will be permanently closed/abandoned under the sanitary line item project slated for FY 2000. Under this project, a force-main sewer system will be extended around the RHIC complex and the former subsurface sanitary disposal systems will be pumped, sampled and abandoned in accordance with local and EPA requirements.

Deliverables: RHIC UIC Closeout Report. Connection of RHIC sanitary systems to main BNL sanitary system

Start Date: December 1, 1999

Completion Date: December 31, 2000

FY 2000 GPIIP Milestones

Completion of actions identified in the Administrative Order.

Personnel and Funding Requirements

Table 11 provides information on personnel responsible for implementing this work, an estimate of the labor required and project milestones.

3.13 ARTICLE 12 CONFORMANCE PROGRAM (GPIIP WBS 1.12)

Scope

As a matter of comity under the 1987 Suffolk County/BNL Agreement, BNL has agreed to conform with the provisions of a Memorandum of Agreement (MOA) between Suffolk County and DOE on the environmental requirements of Suffolk County Sanitary Code (SCSC) Article 12. These articles address hazardous and toxic materials storage facilities. By definition, storage facilities include above ground storage tanks, underground storage tanks (USTs), drum storage areas, piping systems, and closed-loop cooling water systems that contain toxic or hazardous liquids.

BNL has made significant progress toward bringing all toxic and hazardous material storage facilities into conformance with the MOA. Since 1987, approximately 150 of a total of 170 USTs have been upgraded, excavated, removed, or properly abandoned in place with SCDHS oversight and approval. Of the remaining 25 USTs used for the storage of fuel oils, waste oils or gasoline products, all have been upgraded to meet SC Article 12 provisions for secondary containment, leak detection devices, and overfill alarms, where required.

BNL plans to upgrade remaining active storage facilities (i.e., drum storage areas and above ground storage tanks) by the end of FY03. Inactive storage facilities located at the Brookhaven Graphite Research Reactor and Waste Concentration Facility will be removed or abandoned as part of the Environmental Restoration Program. These upgrades are being performed in accordance with the Interagency Agreement (IAG). The intent of these upgrades is to protect groundwater quality by eliminating unnecessary storage facilities, and minimizing releases by providing secondary containment, high-level detection systems, and spill boxes at fill ports. Under this program, approximately 185 storage facilities will be upgraded. An additional 273 tanks require administrative upgrades, such as labeling or submittal of registration materials. In addition, under the CERCLA program, several facilities will undergo remedial actions in 1999 and 2000, including tank removals at Building 811, and continued improvements at the former BGRR.

Actions and Schedule

- 1. Upgrade Tanks (GPIIP WBS 1.12.1):** Design and construct tank upgrades for approx. 120 storage facilities. Projects for FY00 will include underground and aboveground storage facility upgrades at Buildings 50, 495, 326, 452, 275, 629, 550, and 912A. Remaining aboveground storage facilities will be upgraded under a Line Item project that receives its first year funding in FY 2001.

Deliverables: Design and construct tank upgrades.

Start Date: February 1, 1999

Completion Date: December 31, 2003

2. **Improve Remaining Storage Facilities (GPIIP WBS 1.12.2):** Perform required administrative upgrades – specifically the labeling of storage facilities and submittal of registration materials.

Deliverables: Perform required upgrades, and update SCDHS database status.

Start Date: October 1, 1998

Completion Date: December 31, 1999

3. **Remove Building 811 USTs (Environmental Restoration Program):** Removal of inactive radioactive waste USTs at Building 811 as part of the ERD Program.

Deliverables: Remove USTs.

Start Date: See Environmental Restoration Program Current Year Work Plan for FY 2000.

Completion Date: See Environmental Restoration Program Current Year Work Plan for FY 2000.

FY 2000 GPIIP Milestones

Project milestones FY00 will include underground and aboveground storage facility upgrades at Buildings 50, 495, 326, 452, 275, 629, 550, and 912A. Perform required administrative upgrades, such as labeling or submittal of registration materials for 80% remaining of facilities.

Personnel and Funding Requirements

Table 12 provides information on the personnel responsible for implementing this work, an estimate of the labor required, and project milestones. During 1999 and continuing through 2003, the Laboratory expects to expend in excess of 1.2 million dollars to improve the storage of toxic and hazardous materials. Expenditures are contingent upon approval of a FY01 Line Item project.

3.14 COMMUNICATION (GPIIP WBS 1.13)

Scope

In response to the stakeholders desire to be informed about groundwater quality beneath and near BNL, the Laboratory plans to improve the timeliness and access of groundwater monitoring program results. It is also important to ensure that BNL line managers are aware of the impacts, if any, that their facilities are having on groundwater quality, to enable them to initiate appropriate corrective actions in a timely manner.

At present, most non-CERCLA groundwater issues are not managed in the context of a community relations plan. There is a need to integrate non-CERCLA groundwater issues into ongoing and planned community relations activities when appropriate. If warranted, separate community involvement activities will be planned and implemented, in consultation with Community Involvement, Government and Public Affairs Directorate.

As discussed in the GPMP Description, BNL will evaluate the need to establish an internal Groundwater Coordination Committee and the need to re-establish the Groundwater Advisory Committee (GAC) that consisted of external experts, or to create a similar communication mechanism.

Actions and Schedule

1. **Conduct Roundtable Meetings (GPIIP WBS 1.13.1):** Conduct several roundtable discussions to solicit input on BNL's non-CERCLA groundwater monitoring program (within the scope of the GPMP and GPIIP). These roundtables will be informational, and will also involve a dialogue with interested stakeholders on priorities and implementation plans.

Deliverables: Two roundtable meetings on improved communications

Status: **COMPLETED** by May 1999

- 2. Evaluate Need for Internal Groundwater Coordination Committee and an External Groundwater Advisory Committee (GPIIP WBS 1.13.2):** First, evaluate the need for a standing internal committee composed of, but not limited to, groundwater project managers and scientists, water supply personnel, personnel from DOE-BHG, and representatives from departments or facilities that have the potential to impact groundwater beneath the site. Second, evaluate the need to re-establish the Groundwater Advisory Committee that consisted of internal and external groundwater professionals and interested community members in order to facilitate regular communications on future groundwater protection activities.

Deliverables: Decision Paper

Start Date: April 1, 2000

Completion Date: September 29, 2000

- 3. Integrate Non-CERCLA Groundwater Protection Issues into Community Relations (GPIIP WBS 1.13.3):**
Integrate non-CERCLA groundwater protection issues into ongoing and planned community relations activities.

Schedule: On-going

FY 2000 GPIIP Milestones

- Evaluate Need for Internal Groundwater Coordination Committee and an External Groundwater Advisory Committee – provide Issue and Decision Paper.
- Continued integration of non-CERCLA groundwater protection issues into ongoing community relations activities.

Personnel and Funding Requirements

Table 13 provides information on the personnel responsible for implementing this work, an estimate of the labor required, and project milestones.

3.15 POLLUTION PREVENTION/WASTE MINIMIZATION

Scope

The goal of BNL's Pollution Prevention/Waste Minimization (P2/Wmin) Program is to create a systems approach that integrates pollution prevention and waste minimization, resource conservation, recycling, and affirmative procurement into all of BNL's planning and decision making. The scope of the BNL P2/Wmin program includes: 1) elimination or reduction of wastes, effluents and emissions; 2) conservation of natural resources and reuse of materials; 3) recycling; and, 4) procurement of environmentally preferable products.

To emphasize the importance of a robust pollution prevention program at the Laboratory, a number of pollution prevention measures have been placed in the Critical Outcome Performance Measures for FY00. Integration of pollution prevention/waste minimization and resource conservation into all planning and decision making (Performance Measure 3.1.2.1) is the overarching goal. The goal will be measured by actual reductions in the number of spills (Contract Requirement), reduction in tritium releases (Contract Requirement), enhancing the P2 program by formation of a Pollution Prevention Council and performance of opportunity assessments (Measure 3.1.2.2), demonstration of progress meeting secretarial goals for waste reduction (Contract Requirement), and completion of the Process Evaluation Project (Measure 3.1.2.1)

Actions and Schedule

Specific tasks and schedules initiatives for CY 1999 are outlined in the 1999 Current Year Work Plan (CYWP) for Pollution Prevention and Waste Minimization that was submitted to DOE on January 13, 1999. The CYWP will be revised for CY 2000 pollution prevention activities.

In addition to the projects tracked by the CYWP, the activities that are related to the Performance Measures are measured in accordance with the terms and schedules agreed upon in the Critical Outcomes process.

FY 2000 GPIIP Milestones

None of these actions have GPIIP Milestones. See the milestones presented in the 1999 Current Year Work Plan for Pollution Prevention and Waste Minimization (January 13, 1999) and BNL Critical Outcome Performance Measure 3.2.2.

Personnel and Funding Requirements

See the FY 2000 Current Year Work Plan for Pollution Prevention and Waste Minimization and ESD budget request for Pollution Prevention.

3.16 EXCESS MATERIALS INVENTORY

Scope

Excess materials are material and equipment that are no longer needed and are contaminated, activated, and/or hazardous, and are currently in storage on-site. Excess materials that pose a threat to groundwater will be accorded high priority status for disposition. Pursuant to Critical Outcome Performance Measure 4.4 (FY00 Disposition of Excess Materials), the BNL Environmental Management Directorate identified excess material by September 30, 1999.

Action and Schedule

1. Develop plan, consolidate known data, train ECRs, Waste Management Representatives, and ES&H Coordinators (Excess Material Inventory and Disposition Project)

Deliverables: Finalize Management Plan for Excess Material Inventory and Disposition and communicate plan to all affected departments and divisions.

Status: **COMPLETED** on April 20, 1999

2. Perform Tier I assessments of major departments and divisions (Legacy Waste Inventory and Disposition Project):

Deliverables: Tier I Assessments for major departments and divisions.

Status: **Phase I (screening assessments) completed by July 1, 1999**

3. Survey materials, label and take appropriate interim corrective actions (Legacy Waste Inventory and Disposition Project):

Deliverables: Inventory of surveyed and labeled material, report on interim corrective actions.

Status: **COMPLETED** by September 30, 1999. No interim environmental corrective actions required.

4. Submit Activity Data Sheets for highest risk-ranked legacy wastes (Legacy Waste Inventory and Disposition Project):

Deliverables: Activity Data Sheets for highest priority wastes.

Status: To be completed by December 31, 1999

FY 2000 GPIIP Milestones

None of these actions are GPIIP Milestones. See the milestones presented in the *Draft Project Charter: Site Wide Materials Inventory and Disposition Project* (August 2, 1999).

Personnel and Funding Requirements

Refer to the *Draft Project Charter: Site Wide Materials Inventory and Disposition Project* (August 2, 1999).

Attachment 1
Status of GPIIP Milestones Scheduled for Completion in FY99

1. **OUTSTANDING:** Groundwater Contingency Plan: complete and fully implement by 10/1. Delivered to DOE on 7/15/99. A final draft Contingency Plan was provided to DOE on 9/1/99. The plan is being implemented. DOE has verbally indicated it is acceptable. Recommended next steps include presenting it to the BER and IC for approval, and making it an SBMS Subject Area. These actions will be incorporated into the FY00 rebaselined schedule.
2. **GOOD:** Database: Establish EIMS as direct repository for all BNL groundwater data, 8/31/99. Not fully implemented. EIMS has been selected as the direct repository, however current data from the ESD groundwater monitoring program is not being ingested into EIMS at this time. All groundwater data as of July 99 is in the SHSD database. ASL was providing EDDs to ERD up until June 1999. An automated mechanism for transferring the data automatically from the SHSD database to EIMS is under development. It must be complete by December 31, 1999 due to Y2K issues. There are still technical issues that need to be resolved.
3. **OUTSTANDING** for sub-milestone 1.2.1 to define environmental data by 3/15/99. Completed by February 15.
4. **EXCELLENT:** Chain of Custody Integration: complete June 1. Form was completed June 1.
5. **EXCELLENT:** Standard Operating Procedures: unified set of SOPs by 9/30. 41 were committed to in the GPIIP. Total complete as of 9/30 was 42. More were added after GPIIP was finalized. Some others were withdrawn, and some are on hold because they are covered by existing O&M Manuals or SBMS Subject Areas. When the GPIIP is rebaselined in October, the status of these remaining SOPs will be revisited.
6. **N/A:** DQO TBD. N/A. Rescheduled to FY00 due to lack of funding and resources.
7. **EXCELLENT:** QAPP: Develop QAPP by 4/25/99. Milestone met. Note: QAPP was finalized by end of FY99.
8. **EXCELLENT:** Integrated and Improved Reports: Improvements to SER by 10/1/99 and BNL Integrated Monitoring Reports to RHIC by 7/1/99. SER completed by 9/1/99. RHIC report prepared on schedule, but improvements for next round of reporting have been requested.
9. **EXCELLENT (with extension):** Install wells: at high priority facilities by 5/15/99. Install wells at lower priority facilities by 12/31/99. Fifty Phase I (high priority) wells were installed on schedule. An extension to 11/15/99 was requested (verbal approval received) because of delays in contracting. Written extension approval from DOE for Phase II wells has been received.
10. **N/A:** Wellhead Protection program: no milestones scheduled.
11. **EXCELLENT:** Monitoring well abandonment program: Develop BNL Well Abandonment Plan by 8/1/99. Met. No comments were received from DOE. (Note: need to finalize the document)
12. **EXCELLENT:** UIC Program: 9/30/99 per Administrative Order prepare project plan and obtain EPA UIC permits. Met. Project plan was prepared and permit application was submitted before 9/30/99.
13. **Article 12 Compliance:** No milestones scheduled.
14. **OUTSTANDING:** Communication: Hold roundtables by 5/31/99. Met one month early. Two roundtables on the GPMP were held on 4/27 and 4/29. Feedback on the roundtables, and on BNL's new groundwater protection program, was very positive.

Attachment 2
Existing BNL Routine Reports

<u>REPORT</u>	<u>MILESTONE</u>	<u>END USER/ AUDIENCE</u>	<u>CONSOLIDATE</u>
Discharge Monitoring Reports (DMRs)	CERCLA - by 28 th of month STP/Recharge Basins – before 28 th to DOE	CERCLA – DEC Regional Engineer/EPA/DEC/SCDHS STP - DEC/SCDHS (On-site Library)	No- Different timing and sign-offs required
MPF License, Groundwater Monitoring	Semi-annually, June and Dec	DEC Region 1	No – Stand alone document, timing
Site Environmental Report	Compliance Chapter to DOE – April Final to DOE – 10/1	Public, Regulators, In-house technical staff (Library), and on Web	No – Already includes ERD monitoring data
Annual ERD Groundwater Monitoring Report	Draft to DOE, EPA/DEC - 6/15	Regulators, In-house technical staff, Public (Library/Repository)	Yes
OU III South Boundary Pump and Treat Quarterly Reports (system performance data and attach monitor well data)	Due 11/30, 2/26, and 5/28	EPA/DEC/SCDHS	Yes
OU III South Boundary Pump and Treat Annual Report (system performance for 4th quarter and evaluation of monitoring well data)	To DOE 9/17	EPA/DEC/SCDHS	Yes
OU III Industrial Park Treatment System Quarterly and Annual Report	Not due until FY00	EPA/DEC/SCDHS	Yes
HFBR Tritium Quarterly Pump and Recharge Quarterly Reports (system performance data and monitor well data)	To DOE 3/12/99, 7/1/99	EPA/DEC/SCDHS	Yes
HFBR Tritium Annual Pump and Recharge Annual Report (system performance for 4th quarter and evaluation of monitoring well data)	To DOE 3/12/99	EPA/DEC/SCDHS	Yes
OU IV Quarterly AS/SVE Treatment System Reports	To DOE 4/1, 7/9	EPA/DEC/SCDHS	Yes
OU IV Annual AS/SVE Treatment System Report	To DOE 3/30	EPA/DEC/SCDHS	Yes
OU IV Annual Bldg. 650 Sump Outfall Interim Remedy Monitoring Report (groundwater and soil)	To DOE 3/31	EPA/DEC/SCDHS	Yes
OU VI Quarterly Monitored Natural Attenuation Reports (Annual Reports start FY00)	To DOE 6/1, 9/1	EPA/DEC/SCDHS	Yes
RA V Pump and Treat Quarterly Reports (system performance data and monitor well data)	To DOE 7/1, 9/30	EPA/DEC/SCDHS	Yes
RA V Pump and Treat Annual Report (system performance for 4th quarter and evaluation of monitoring well data)	To DOE 4/1	EPA/DEC/SCDHS	Yes
Annual Landfills Report (soil gas, groundwater monitoring)	To DOE 1/29	DEC Part 360 Requirements/ EPA/SCDHS	No – Stand-alone
Annual ERD Sampling and Analysis Plan	To DOE 11/30	EPA/DEC/SCDHS	Yes
Annual BNL QAPP – groundwater first year, other media starting 2000	To DOE 4/26	EPA/DEC/SCDHS	No – Stand alone but is integrated with ESD

Annual BNL Well Abandonment Plan	To DOE mid-year	EPA/DEC/SCDHS	No – Stand alone but is integrated with ESD
BNL Facility Monitoring Reports	Quarterly or Semi-annually (not due until CY2000)	BNL Facilities	No – Stand alone and different audience
Annual BNL Environmental Monitoring Plan	To DOE 10/30/99. Update changes annually and revise every three years	DOE, EPA, DEC, SCDHS	Yes

Attachment 3
BNL Routine Reports Proposed for Consolidation

1. Quarterly Reports for CERCLA Remediation Systems: These reports primarily evaluate the performance of the treatment systems in terms of operational efficiency, but also provide monitoring well data. Quarterly reports are also submitted for projects with monitored natural attenuation remedies. The reports are currently submitted to DOE on a staggered basis depending when each system went into operation. It is proposed to submit them together as one report for each of the four quarters starting with calendar year (CY) 2000. **Milestone:** Develop consistent format by 9/30/99. Submit to DOE three months after the calendar quarter ends: 6/30/00, 9/30/00, 12/30/00, 3/30/01.

2. Annual BNL Groundwater Monitoring Report (GMR): This report currently consists of a summary of the data from CERCLA-related monitoring wells. It is proposed that starting with the CY 1999 report it include both CERCLA and the Facility Monitoring Program groundwater data. This report would also include the annual summary of the monitoring wells/plumes associated with the remediation systems. Information from this report would feed into the BNL Site Environmental Report. Put Executive Summary on the BNL Web site. **Milestone:** It is proposed to submit this report to DOE on 6/15/00.

3. Site Environmental Report (SER): This report currently incorporates a summary of all BNL groundwater data, as well as all other environmental media sampled to provide a comprehensive evaluation of the entire site. The SER will continue to be the most visibly viewed BNL document from a public perspective. No additional consolidation is proposed for the SER at this time. **Milestone:** Provide CY 1998 SER on the BNL Web site by October 1, 1999.

4. BNL Environmental Monitoring Plan (EMP): This report currently describes ESD environmental monitoring required under DOE Order 5400.1 and State permits, and ERD groundwater monitoring program required under CERCLA. In addition, ERD currently prepares an Annual Sampling and Analysis Plan for groundwater monitoring. It is proposed that starting in CY 2000, that one umbrella document be prepared, the BNL Annual Environmental Monitoring Plan (EMP), which would provide the overall approach and structure for Laboratory-wide monitoring. An appendix to the EMP would be the more detailed SAP for groundwater monitoring. The EMP will be revised every three years and updated annually in accordance with DOE Orders. **Milestone:** Revised CY 2000-2003 EMR due to DOE by October 30, 1999. Submittal of the SAP as an appendix needs to be accelerated from 11/30/99 to 10/30/99.

5. BNL Facility Monitoring Reports (FMRs): These new reports would present facility-related groundwater and air data on either a quarterly or semi-annual basis to the BNL facility operators. Submittal of these reports would be staggered from the quarterly CERCLA remediation system reports to ease the strain on resources. **Milestone:** Submit FEMRs either quarterly or semi-annually starting in July 1999.