

## Compliance Status

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*Brookhaven National Laboratory (BNL) is subject to more than 100 sets of federal, state, and local environmental regulations; numerous site-specific permits; equivalency permits for operation of twelve groundwater remediation systems; and several other binding agreements. In 2004, BNL operated in full compliance with most of these requirements, and programs are in place to address areas for continued improvement. Routine inspections conducted during the year found no significant instances of noncompliance, however, minor deficiencies were noted during inspections conducted by the New York State Department of Environmental Conservation (NYSDEC).*

*Emissions of nitrogen oxides, carbon monoxide, and sulfur dioxide were all within permit limits. Approximately 5,450 pounds of ozone-depleting refrigerants were shipped for recycling through the Department of Defense, and another 640 pounds were recovered and recycled on site. Monitoring of the BNL potable water system showed that the potable water supply met all drinking water requirements. Groundwater monitoring at the Major Petroleum Facility continued to demonstrate that current oil storage and transfer operations are not affecting groundwater quality. During 2004, liquid effluents discharged to surface water and groundwater met all applicable New York State Pollutant Discharge Elimination System permit requirements, with the exception of six excursions at the Sewage Treatment Plant. These permit excursions were reported to NYSDEC and the Suffolk County Department of Health Services.*

*Thirty reportable spills of petroleum products or antifreeze occurred on site in 2004. Nineteen were petroleum releases less than 5 gallons, four were small-volume antifreeze spills, two larger spills were discovered during tank removals, four spills resulted from failed equipment, and one spill was a release of oil from two transformers that were contaminated with polychlorinated biphenyls (PCBs). All releases were cleaned up or addressed to the satisfaction of NYSDEC.*

*BNL underwent twelve environmental audits by external regulatory agencies in 2004. These audits included inspections of petroleum and chemical storage, air emissions from the Central Steam Facility, Hazardous Waste management facilities, Sewage Treatment Plant operations, other regulated outfalls and recharge basins, and the potable water system. Immediate corrective actions were taken to address all issues raised during these inspections. NYSDEC conducted two reviews of the hazardous waste program in 2004, and Notices of Violation were issued for administrative deficiencies (primarily labeling issues).*

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### 3.1 COMPLIANCE WITH REQUIREMENTS

BNL is subject to more than 100 sets of federal, state, and local environmental regulations; several site-specific permits; 16 equivalency permits for the operation of 12 groundwater

remediation systems; and several other binding agreements. The federal, state, and local environmental statutes and regulations that BNL operates under are summarized in Table 3-1, along with a discussion of BNL's compliance status

with regard to each requirement. A complete listing of all applicable environmental regulations is contained in Appendix D.

## 3.2 ENVIRONMENTAL PERMITS

### 3.2.1 Existing Permits

Many processes and facilities at BNL operate under permits issued by environmental regulatory agencies. Table 3-2 provides a complete list of the existing permits, some of which are briefly described below.

- State Pollutant Discharge Elimination System (SPDES) permit, issued by NYSDEC
- Major Petroleum Facility (MPF) license, issued by NYSDEC
- Resource Conservation and Recovery Act (RCRA) permit issued by NYSDEC for the Waste Management Facility
- Registration certificate from NYSDEC for tanks storing bulk quantities of hazardous substances
- Seven radiological emission authorizations issued by EPA under the National Emission Standards for Hazardous Air Pollutants (NESHAPs)
- Air emissions permit issued by NYSDEC under Title V of the Clean Air Act Amendments authorizing the operation of 16 emissions units
- Four permits issued by NYSDEC for construction activities within the Peconic River corridor
- An EPA Underground Injection Control (UIC) Area permit for the operation of 90 UIC wells
- Permit for the operation of six domestic water supply wells, issued by NYSDEC
- Sixteen equivalency permits for the operation of 12 groundwater remediation systems installed under the Inter-Agency Agreement (Federal Facility Agreement under the Comprehensive Environmental Response, Compensation and Liability Act [CERCLA] 120, Administrative Docket No. II-CERCLA-FFA-00201)

### 3.2.2 New or Modified Permits and Requests

#### 3.2.2.1 State Pollutant Discharge Permits

The SPDES permit authorizes discharges from the BNL Sewage Treatment Plant (STP) to the Peconic River, and discharges of cooling water and stormwater to recharge basins. In February 2004, NYSDEC approved the Laboratory's petition to allow filtration of stormwater runoff samples prior to acid preservation. Filtration reduces the contribution of metals (primarily aluminum and iron) from natural sediment and is more representative of BNL's discharges. Filtration was permitted since stormwater is discharged to recharge basins, which effectively filter out these particulates before the water recharges to groundwater. A second revision contained in the modified permit postponed chronic toxicity testing to 2005. The current SPDES permit expires in March 2005. Therefore, in accordance with New York State Uniform Procedures, a SPDES permit renewal request was filed in August 2004 (i.e., 180 days before the permit expiration date).

Discharges of treated groundwater under the CERCLA program are also permitted by NYSDEC through the issuance of SPDES equivalency permits. In 2004, four SPDES equivalency permits were issued, one each for treatment systems identified as North Street/North Street East, LIPA/Airport, Ethylene Dibromide, and Industrial Park East.

SPDES equivalency permits are discussed in Volume II of the SER, *Groundwater Status Report*.

#### 3.2.2.2 Air Emissions Permits

Air emissions permits are granted by NYSDEC. Permits are issued either as "equivalency" permits for restoration projects conducted under CERCLA, or as changes to the BNL Title V operating permit, which was issued in January 2002 and subsequently amended in November 2002. During 2004, no CERCLA equivalency permits were issued and no changes were made to the BNL Title V operating permit.

The Title V permit consolidates all applicable federal and state requirements for BNL's

regulated emission sources into a single document. BNL has a variety of nonradioactive air emission sources covered under the permit that are subject to federal or state regulations. Section 3.5 describes the more significant sources and the methods used by BNL to comply with the applicable regulatory requirements.

**3.2.2.3 Underground Injection Control (UIC) Permit**

Under the Safe Drinking Water Act (SDWA), BNL is required to maintain an Area Permit for UIC wells (e.g., drywells, cesspools, and leaching pools). BNL received a final permit in January 2001. This permit authorizes the operation of 90 UICs, including 86 stormwater drywells and four small sanitary systems. The only change to the UIC inventory in 2004 was the partial closure of a sanitary wastewater disposal system at Building 445. The remediation of contaminated sediments from this system continued into 2005. This device is expected to be closed in the spring of 2005. UICs also are

used for the disposal of treated groundwater at many restoration facilities. In 2004, the inventory on record with EPA was updated, bringing the total number of UICs used for restoration to 34. These devices are authorized by rule, as opposed to a permit, and an inventory of the devices is maintained with EPA.

**3.3 NATIONAL ENVIRONMENTAL POLICY ACT**

The National Environmental Policy Act (NEPA) regulations require federal agencies to evaluate the effects of proposed major federal activities on the environment. The prescribed evaluation process ensures that the proper level of environmental review is performed before an irreversible commitment of resources is made. During 2004, environmental evaluations were completed for 127 proposed projects. Of these projects, 111 were considered minor actions requiring no additional documentation. The remaining 16 projects were addressed through the submission of Environmental Evaluation Notification Forms

**Table 3-1. Federal, State, and Local Environmental Statutes and Regulations Applicable to BNL.**

Regulator: Codified Regulation	Regulatory Program Description	Compliance Status	SER Report Sections
EPA: 40 CFR 300 40 CFR 302 40 CFR 355 40 CFR 370	The Comprehensive Environmental Response, Compensation & Liability Act (CERCLA) provides the regulatory framework for remediation of releases of hazardous substances and remediation of inactive hazardous waste disposal sites.	In 1989, BNL entered into a tri-party agreement with EPA, New York State Department of Environmental Conservation (NYSDEC), and DOE. BNL site remediation is conducted by the Environmental Restoration Program in accordance with milestones established under this agreement.	2.3.4.8
Council for Env. Quality: 40 CFR 1500–1508 DOE: 10 CFR 1021	The National Environmental Policy Act (NEPA) requires federal agencies to follow a prescribed process to anticipate the impacts on the environment of proposed major federal actions and alternatives. DOE codified its implementation of NEPA in 10 CFR 1021.	BNL is in full compliance with NEPA requirements. The Laboratory has established sitewide procedures for implementing the NEPA requirements.	3.3
Advisory Council on Historic Preservation: 36 CFR 60 36 CFR 63 36 CFR 79 36 CFR 800 16 USC 470	The National Historic Preservation Act (NHPA) identifies, evaluates, and protects historic properties eligible for listing in the National Register of Historic Places, commonly known as the National Register. Such properties can be archeological sites or historic structures, documents, records, or objects. NHPA is administered by state historic preservation offices (SHPOs). In New York, that is the NYSHPO. At BNL, structures that may be subject to NHPA include the High Flux Beam Reactor (HFBR), the Brookhaven Graphite Research Reactor (BGRR) complex, World War I training trenches near the Relativistic Heavy Ion Collider project, and the former Cosmotron Building.	The HFBR, BGRR complex, and World War I trenches are eligible for inclusion in the National Register. The former Cosmotron Building was identified as potentially eligible in an April 1991 letter from NYSHPO. Any proposed activities involving these facilities must be identified through the NEPA process and evaluated to determine if the action would affect the features that make the facility eligible. Some actions required for decontaminating and decommissioning the BGRR were determined to affect its eligibility, and mitigative actions are proceeding according to a Memorandum of Agreement between DOE and NYSHPO. BNL has a Cultural Resource Management Plan to ensure compliance with cultural resource regulations.	3.4

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CHAPTER 3: COMPLIANCE STATUS

Table 3-1. Federal, State, and Local Environmental Statutes and Regulations Applicable to BNL (continued).

Regulator: Codified Regulation	Regulatory Program Description	Compliance Status	SER Report Sections
EPA: 40 CFR 50-0 40 CFR 82 NYSDEC: 6 NYCRR 200-257* 6 NYCRR 307	The Clean Air Act (CAA) and the NY State Environmental Conservation Laws regulate the release of air pollutants through permits and air quality limits. Emissions of radionuclides are regulated by EPA, via the National Emission Standards for Hazardous Air Pollutants (NESHAPs) authorizations.	All air emission sources are incorporated into the BNL Title V permit or have been exempted under the New York State air program.	3.5
EPA: 40 CFR 109-140* 40 CFR 230, 231 40 CFR 401, 403 NYSDEC: 6 NYCRR 700-703 6 NYCRR 750	The Clean Water Act (CWA) and NY State Environmental Conservation Laws seek to improve surface water quality by establishing standards and a system of permits. Wastewater discharges are regulated by NYSDEC permits through the State Pollutant Discharge Elimination System (SPDES).	At BNL, permitted discharges include treated sanitary waste, and cooling tower and stormwater discharges. With the exception of six excursions, these discharges met the SPDES permit limits in 2004.	3.6
EPA: 40 CFR 141-149 NYSDOH: 10 NYCRR 5	The Safe Drinking Water Act (SDWA) and New York State Department of Health (NYSDOH) standards for public water supplies establish minimum drinking water standards and monitoring requirements. SDWA requirements are enforced by the Suffolk County Department of Health Services (SCDHS).	BNL maintains a sitewide public water supply. This water supply met all primary drinking water standards as well as operational and maintenance requirements.	3.7
EPA: 40 CFR 112 40 CFR 300 40 CFR 302 40 CFR 355 40 CFR 370 40 CFR 372	The Oil Pollution Act, the Emergency Planning & Community Right-to-Know Act (EPCRA), and the Superfund Amendment Reauthorization Act (SARA) require facilities with large quantities of petroleum products or chemicals to prepare emergency plans and report their inventories to EPA, the state, and local emergency planning groups.	Since some facilities at BNL store or use chemicals or petroleum in quantities exceeding threshold planning quantities, BNL is subject to these requirements. BNL fully complies with all reporting and emergency planning requirements.	3.8.1 3.8.2 3.8.3
EPA: 40 CFR 280 NYSDEC: 6 NYCRR 595-597 6 NYCRR 611-613 SCDHS: SCSC Article 12	Federal, state, and local regulations govern the storage of chemicals and petroleum products to prevent releases of these materials to the environment. SCDHS has safety codes that are more stringent than the federal and state regulations	The regulations require that these materials be managed in facilities equipped with secondary containment, overfill protection, and leak detection. BNL complies with all federal and state requirements and has achieved conformance to county codes.	3.8.4 3.8.5 3.8.6
EPA: 40 CFR 260-280* NYSDEC: 6 NYCRR 360-372*	The Resource Conservation Recovery Act (RCRA) and New York State Solid Waste Disposal Act govern the generation, storage, handling, and disposal of hazardous wastes.	BNL is defined as a large-quantity generator of hazardous waste and has a permitted waste management facility. While almost all wastes are handled and disposed in accordance with federal and state requirements, two NYSDEC audits conducted in 2004 identified several concerns. These were immediately addressed by corrective actions.	3.9
EPA: 40 CFR 700-763*	The Toxic Substances Control Act (TSCA) regulates the manufacture, use, and distribution of all chemicals.	BNL manages all TSCA-regulated materials, including PCBs, in compliance with all requirements.	3.10
EPA: 40 CFR 162-171(f) NYSDEC: 6 NYCRR 320 6 NYCRR 325-329	The Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) and corresponding NY State regulations govern the manufacture, use, storage, and disposal of pesticides and herbicides, as well as the pesticide containers and residuals.	BNL employs NY State-certified pesticide applicators to apply pesticides and herbicides. Each applicator attends training as needed to maintain current certification, and files an annual report to the State detailing the types and quantity of pesticides applied.	3.11

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Table 3-1. Federal, State, and Local Environmental Statutes and Regulations Applicable to BNL (continued).

Regulator: Codified Regulation	Regulatory Program Description	Compliance Status	SER Report Sections
DOE: 10 CFR 1022 NYSDEC: 6 NYCRR 663 6 NYCRR 666	DOE regulations require its facilities to comply with floodplain/wetland review requirements. The New York State Fresh Water Wetlands and Wild, Scenic, and Recreational Rivers rules govern development in the state's natural waterways. Development or projects within a half-mile of regulated waters must have NYSDEC permits.	BNL is in the Peconic River watershed and has several jurisdictional wetlands; consequently, development of locations in the north and east of the site requires NYSDEC permits and review for compliance under DOE wetland/floodplain regulations. During 2004, four projects were permitted under New York State programs.	3.12
U.S. Fish & Wildlife Service: 50 CFR 17 NYSDEC: 6 NYCRR 182	The Endangered Species Act and corresponding New York State regulations prohibit activities that would jeopardize the continued existence of an endangered or threatened species, or cause adverse modification to a critical habitat.	Eight additional species on the NYS list have been found at BNL, for a total of 38. In the "endangered" category are one insect, one amphibian, and one plant. In the "threatened" category are one insect, two fish, one bird, and two plants. Of "special concern" are one insect, two amphibians, four reptiles, and five birds. The remaining 16 species are vulnerable or rare plants. BNL's <i>Natural Resource Management Plan</i> outlines activities to protect species and protect their habitats.	3.13
DOE: Manual 231.1-1A	The Environment, Safety, and Health Reporting Program objective is to ensure timely collection, reporting, analysis, and dissemination of information on environment, safety, and health issues as required by law or regulations or as needed to ensure that DOE is kept fully informed on a timely basis about events that could adversely affect the health and safety of the public, workers, the environment, the intended purpose of DOE facilities, or the credibility of the DOE. Included in the order are the requirements for the Occurrence Reporting and Processing of Operations Program, known as ORPS.	BNL prepares an annual Site Environmental Report and provides data for DOE to prepare annual NEPA summaries and other Safety, Fire Protection, and OSHA reports. BNL developed the ORPS subject area for staff and management who perform specific duties related to discovery, response, notification, investigation, and reporting of occurrences to BNL and DOE management. The ORPS subject area is supported by these additional documents: Occurrence Reporting Program Description, Critiques subject area, Occurrence Categorizer's Procedure, and the ORPS Office Procedure.	All chapters
DOE: Order 414.1 10 CFR 830, Subpart A Policy 450.5	The Quality Assurance (QA) Program objective is to establish an effective management system using the performance requirements of this Order, coupled with technical standards, where appropriate, to ensure: senior management provides planning, organization, direction, control, and support to achieve DOE objectives; line organizations achieve and maintain quality while minimizing safety and health risks and environmental impacts and maximizing reliability and performance; line organizations have a basic management system in place supporting this Order; and each DOE element reviews, evaluates, and improves its overall performance and that of its contractors using a rigorous assessment process based on an approved QA Program.	BNL has a Quality Management (QM) System to implement quality management methodology throughout its management systems and associated processes to: 1) plan and perform Laboratory operations reliably and effectively to minimize the impact on the safety and health of humans and on the environment; 2) standardize processes and support continuous improvement in all aspects of Laboratory operations; and 3) enable the delivery of products and services that meet customers' requirements and expectations. Having a comprehensive program ensures that all environmental monitoring data meet QA and quality control requirements. Samples are collected and analyzed using standard operating procedures, to ensure representative samples and reliable, defensible data. Quality control in the analytical labs is maintained through daily instrument calibration, efficiency and background checks, and testing for precision and accuracy. Data are verified and validated according to project-specific quality objectives before they are used to support decision making.	Chapter 9
DOE: Order 435.1	The Radioactive Waste Management Program objective is to ensure that all DOE radioactive waste is managed in a manner that protects workers, public health and safety, and the environment. DOE Order 435.1 requires all DOE organizations that generate radioactive waste to implement a waste certification program. DOE Laboratories must develop a Radioactive Waste Management Basis (RWMB) Program Description, which includes exemption and timeframe requirements for staging and storing radioactive wastes, both routine and nonroutine.	The BNL Waste Certification Program Plan (WCPP) in the RWMB Program Description defines the radioactive waste management program's structure, logic, and methodology for waste certification. New or modified operations or activities that do not fall within the scope of the RWMB Program Description must be documented and approved before implementation. BNL's RWMB Program Description describes the BNL policies, procedures, plans, and controls demonstrating that BNL has the management systems, administrative controls, and physical controls to comply with DOE Order 435.1.	2.3.4.3

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Table 3-1. Federal, State, and Local Environmental Statutes and Regulations Applicable to BNL (concluded).

Regulator: Codified Regulation	Regulatory Program Description	Compliance Status	SER Report Sections
DOE: Order 450.1 (former Order 5400.1)	The Environmental Protection Program objective is to implement sound stewardship practices that protect the air, water, land, and other natural and cultural resources affected by DOE operations in a cost-effective manner, meeting or exceeding applicable environmental, public health, and resource protection laws and regulations, and DOE requirements. DOE facilities meet this objective by implementing an Environmental Management System (EMS) that is part of an Integrated Safety Management System (ISMS). Other components include establishing sound environmental monitoring programs to comply with former DOE Order 5400.1.	BNL's EMS was officially registered to the ISO 14001:1996 Standard in 2001. Annual audits to maintain certification were done in 2002 and 2003. In June 2004, a recertification audit was conducted and BNL was found to conform to the ISO 14001: 2004 Standard. The BNL ISMS program description presents the Laboratory's approach to integrating environment, safety, and health requirements into the processes for planning and conducting work at BNL. It describes BNL's programs, including the Standards-Based Management System (SBMS), for accomplishing work safely and provides a road map of the systems and processes.	Chapter 2
DOE: Order 5400.5, Change 2	To protect members of the public and the environment against undue risk from radiation, the Radiation Protection of the Public and Environment Program establishes standards and requirements for operations of DOE and DOE contractors.	BNL uses the guidance values provided in DOE Order 5400.5 to ensure that effluents and emissions do not affect the environment or public and worker safety and health, and to ensure that all doses meet the "As Low As Reasonably Achievable" (ALARA) policy.	Chapters 4, 5, 6, and 8

Notes:  
CFR = Code of Federal Regulations  
NYCRR = New York Codes, Rules, and Regulations  
SCSC = Suffolk County Sanitary Code

to DOE. Evaluation of these projects resulted in the determination by DOE that they were either covered by existing Categorical Exclusions, as defined in Volume 10 of the Code of Federal Regulations, Section 1021 (referred to as 10 CFR 1021), or fell within the scope of a previous environmental assessment. Therefore, new environmental assessments were not required.

**3.4 HISTORIC PRESERVATION AND ARCHEOLOGY**

BNL is subject to several cultural resource laws, most notably the National Historic Preservation Act (NHPA) and the Archeological Resource Protection Act (ARPA). These acts require federal agencies to identify, evaluate, and consider the effects of federal actions on historical and archeological sites eligible for listing or inclusion on the National Register of Historic Places. The sites may include historic structures, objects, documents, and cultural or natural places that have importance to Native Americans or other ethnic groups.

BNL has three structures or sites that have been determined to be eligible for listing on the National Register of Historic Places:

the Brookhaven Graphite Research Reactor (BGRR) complex, the High Flux Beam Reactor (HFBR) complex, and the World War I Army training trenches associated with Camp Upton. In 2004, BNL submitted NHPA Section 106 packages to the New York State Historic Preservation Officer documenting the determination that two WW II-era buildings, slated for demolition, were not eligible for listing on the National Register of Historic Places. Those structures are Building 193, the Credit Union/Bank, and Building 527, used for offices.

The annual Department of Interior questionnaire regarding historic and cultural resources was completed and submitted as required. Additional activities in 2004 associated with NHPA and ARPA compliance are identified in Chapter 6, Section 6.9, Cultural Resource Activities.

**3.5 CLEAN AIR ACT**

The objectives of the Clean Air Act (CAA), which is administered by EPA and NYSDEC, are to improve or maintain regional ambient air quality through operational and engineering controls on stationary or mobile sources of air

Table 3-2. BNL Environmental Permits.

Issuing Agency	Bldg or Facility	Process/Permit Description	Permit ID No.	Expiration or Completion	Emission Unit ID	Source ID
EPA - NESHAPs	510	Calorimeter Enclosure	BNL-689-01	None	NA	NA
EPA - NESHAPs	705	Building Ventilation	BNL-288-01	None	NA	NA
EPA - NESHAPs	820	Accelerator Test Facility	BNL-589-01	None	NA	NA
EPA - NESHAPs	AGS	AGS Booster - Accelerator	BNL-188-01	None	NA	NA
EPA - NESHAPs	RHIC	Accelerator	BNL-389-01	None	NA	NA
EPA - SDWA	BNL	Underground Injection Control	NYU500001	11-Feb-11	NA	NA
NYSDEC - Air Equivalency	517	Middle Road System	1-51-009	NA	NA	NA
NYSDEC - Air Equivalency	518	South Boundary System	1-51-009	NA	NA	NA
NYSDEC - Air Equivalency	598	OU I Remediation System	1-52-009	NA	NA	NA
NYSDEC - Air Equivalency	539	Western South Boundary System	1-52-009	NA	NA	NA
NYSDEC - Air Equivalency	TR 867	T-96 Remediation System	NA	NA	NA	NA
NYSDEC - SPDES Equivalency	517	Middle Road System	1-51-009	NA	NA	NA
NYSDEC - SPDES Equivalency	518	South Boundary System	1-51-009	NA	NA	NA
NYSDEC - SPDES Equivalency	539	W. South Boundary System	1-52-009	NA	NA	NA
NYSDEC - SPDES Equivalency	598	OU I Remediation System	1-52-009	31-Oct-06	NA	NA
NYSDEC - SPDES Equivalency	598	Tritium Remediation System	1-52-009	NA	NA	NA
NYSDEC - SPDES Equivalency	670	Sr-90 Treatment System	None	NA	NA	NA
NYSDEC - SPDES Equivalency	TR 829	Carbon Tetrachloride System	None	NA	NA	NA
NYSDEC - SPDES Equivalency	OS-4	Airport/LIPA Treatment System	None	NA	NA	NA
NYSDEC - SPDES Equivalency	OS-2	Industrial Park East Treatment System	None	NA	NA	NA
NYSDEC - SPDES Equivalency	OS-5	North St./North St. East Treatment System	None	NA	NA	NA
NYSDEC - SPDES Equivalency	OS-6	Ethylene Di-Bromide Treatment System	None	NA	NA	NA
NYSDEC - Hazardous Substance	BNL	Bulk Storage Registration Certificate	1-000263	27-Jul-05	NA	NA
NYSDEC - LI Well Permit	BNL	Domestic Potable/Process Wells	1-4722-00032/00113	13-Sep-08	NA	NA
NYSDEC - Air Quality	197	Lithographic Printing Presses	1-4722-00032/00115	06-Jan-07	U-LITHO	19709-10
NYSDEC - Air Quality	423	Metal Parts Cleaning Tanks	1-4722-00032/00115	06-Jan-07	U-METAL	42306-08
NYSDEC - Air Quality	423	Gasoline Storage & Fuel Pumps	1-4722-00032/00115	06-Jan-07	U-FUELS	42309-10
NYSDEC - Air Quality	423	Motor Vehicle A/C Servicing	1-4722-00032/00115	06-Jan-07	U-MVACS	MVAC1&2
NYSDEC - Air Quality	458	Paint Spray Booth	1-4722-00032/00115	06-Jan-07	U-45801	45801
NYSDEC - Air Quality	458	Flammable Liquid Storage Cabinet	1-4722-00032/00115	06-Jan-07	U-45801	458AA
NYSDEC - Air Quality	473	Metal Parts Cleaning Tank	1-4722-00032/00115	06-Jan-07	U-METAL	47302
NYSDEC - Air Quality	479	Metal Parts Cleaning Tank	1-4722-00032/00115	06-Jan-07	U-METAL	47906
NYSDEC - Air Quality	490	Milling Machine/Block Cutter	1-4722-00032/00115	06-Jan-07	U-49003	49003
NYSDEC - Air Quality	490	Lead Alloy Melting	1-4722-00032/00115	06-Jan-07	U-49003	49004
NYSDEC - Air Quality	498	Aqueous Cleaning Facility	1-4722-00032/00115	06-Jan-07	U-METAL	49801
NYSDEC - Air Quality	535B	Plating Tanks	1-4722-00032/00115	06-Jan-07	U-INSIG	53501
NYSDEC - Air Quality	535B	Etching Machine	1-4722-00032/00115	06-Jan-07	U-INSIG	53502
NYSDEC - Air Quality	535B	Printed Circuit Board Process	1-4722-00032/00115	06-Jan-07	U-INSIG	53503
NYSDEC - Air Quality	610	Combustion Unit	1-4722-00032/00115	06-Jan-07	U-61005	61005
NYSDEC - Air Quality	610	Combustion Unit	1-4722-00032/00115	06-Jan-07	U-61006	61006
NYSDEC - Air Quality	610	Combustion Unit	1-4722-00032/00115	06-Jan-07	U-61007	61007
NYSDEC - Air Quality	610	Metal Parts Cleaning Tray	1-4722-00032/00115	06-Jan-07	U-METAL	61008

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Table 3-2. BNL Environmental Permits (concluded).

Issuing Agency	Bldg or Facility	Process/Permit Description	Permit ID No.	Expiration or Completion	Emission Unit ID	Source ID
NYSDEC - Air Quality	610	Combustion Unit	1-4722-00032/00115	06-Jan-07	U-61005	6101A
NYSDEC - Air Quality	630	Gasoline Storage and Fuel Pumps	1-4722-00032/00115	06-Jan-07	U-FUELS	63001-03
NYSDEC - Air Quality	820	Metal Parts Cleaning Tank	1-4722-00032/00115	06-Jan-07	U-METAL	82001
NYSDEC - Air Quality	902	Epoxy Coating/Curing Exhaust	1-4722-00032/00115	06-Jan-07	U-COILS	90206
NYSDEC - Air Quality	903	Metal Parts Cleaning Tank	1-4722-00032/00115	06-Jan-07	U-METAL	90304
NYSDEC - Air Quality	919B	Electroplating Operation	1-4722-00032/00115	06-Jan-07	U-INSIG	91904
NYSDEC - Air Quality	922	Metal Parts Cleaning Tank	1-4722-00032/00115	06-Jan-07	U-METAL	92202-03
NYSDEC - Air Quality	922	Electroplating Operation	1-4722-00032/00115	06-Jan-07	U-INSIG	92204
NYSDEC - Air Quality	923	Electronic Equipment Cleaning	1-4722-00032/00115	06-Jan-07	U-METAL	9231A
NYSDEC - Air Quality	923	Parts Drying Oven	1-4722-00032/00115	06-Jan-07	U-METAL	9231B
NYSDEC - Air Quality	924	Magnet Coil Production Press	1-4722-00032/00115	06-Jan-07	U-INSIG	92402
NYSDEC - Air Quality	924	Vapor/Ultrasonic Degreasing Unit	1-4722-00032/00115	06-Jan-07	U-METAL	92404
NYSDEC - Air Quality	Site	Halon 1211 Portable Extinguishers	1-4722-00032/00115	06-Jan-07	U-HALON	H1211
NYSDEC - Air Quality	Site	Halon 1301 Fire Suppression Systems	1-4722-00032/00115	06-Jan-07	U-HALON	H1301
NYSDEC - Air Quality	Site	Packaged A/C Units	1-4722-00032/00115	06-Jan-07	U-RFRIG	PKG01-02
NYSDEC - Air Quality	Site	Reciprocating Chillers	1-4722-00032/00115	06-Jan-07	U-RFRIG	REC01-41
NYSDEC - Air Quality	Site	Rotary Screw Chillers	1-4722-00032/00115	06-Jan-07	U-RFRIG	ROTO1-07
NYSDEC - Air Quality	Site	Split A/C Units	1-4722-00032/00115	06-Jan-07	U-RFRIG	SPL01-02
NYSDEC - Air Quality	Site	Centrifugal Chillers	1-4722-00032/00115	06-Jan-07	U-RFRIG	CEN01-22
NYSDEC - Hazardous Waste	WMF	Waste Management	1-4722-00032/00102	12-Jul-05	NA	NA
NYSDEC - Natural Resources	AGS	Construction of AGS Storage Facility	1-4722-00032/00133	03-Jun-06	NA	NA
NYSDEC - Natural Resources	RHIC	Construction of New Recharge Basin	1-4722-00032/00129	17-May-04	NA	NA
NYSDEC - Natural Resources	RHIC	Paving at Bldgs. 1002 and 1004	1-4722-00032/00135	09-Oct-08	NA	NA
NYSDEC - Natural Resources	RHIC	Construct 9C/7C Alcove Building	1-4722-00032/00137	08-Sep-08	NA	NA
NYSDEC - NESHAPs	REF	Radiation Effects/Neutral Beam	BNL-789-01	None	NA	NA
NYSDEC - NESHAPs	RTF	Radiation Therapy Facility	BNL-489-01	None	NA	NA
NYSDEC - Water Quality	CSF	Major Petroleum Facility	1-1700	31-Mar-07	NA	NA
NYSDEC - Water Quality	STP	Sewage Plant and Recharge Basins	NY-0005835	01-Mar-05	NA	NA

Notes:

AGS = Alternating Gradient Synchrotron

CSF = Central Steam Facility

ID = Identification

NESHAPs = National Emission Standards for Hazardous Air Pollutants

NYSDEC = New York State Department of Environmental Conservation

NA = Not Applicable

OU = Operable Unit

REF = Radiation Effects Facility

RTF = Radiation Therapy Facility

RHIC = Relativistic Heavy Ion Collider

SDWA = Safe Drinking Water Act

STP = Sewage Treatment Plant

WMF = Waste Management Facility

pollution. Both conventional and hazardous air pollutants are regulated under the CAA.

**3.5.1 Conventional Air Pollutants**

BNL has a variety of conventional, nonradioactive air emission sources that are subject to federal or state regulations. The following subsections describe the more significant sources and the methods used by BNL to comply with the applicable regulatory requirements.

**3.5.1.1 Boiler Emissions**

BNL has four boilers (Nos. 1A, 5, 6, and 7) at the Central Steam Facility that are subject to NYSDEC Reasonably Available Control Technology (RACT) requirements. Three of the boilers can burn either residual fuel oil or natural gas; Boiler 1A burns fuel oil only. In 2004, low nitrogen residual oil (below 0.3 percent) was the predominant fuel burned in all four boilers.

For boilers with maximum operating heat inputs greater than or equal to 50 MMBtu/hr (14.6 MW), RACT requirements establish emissions standards for oxides of nitrogen (NO<sub>x</sub>). Boilers with a maximum operating heat input between 50 and 250 MMBtu/hr (14.6 and 73.2 MW) can demonstrate compliance using periodic emission tests or by using continuous emission monitoring equipment. Emission tests conducted in 1995 confirmed that BNL Boilers 1A and 5, both in this size category, met the NO<sub>x</sub> emission standards when burning residual fuel oil with low nitrogen content. To ensure continued compliance, each year an outside contract laboratory analyzes composite samples (collected quarterly) of fuel deliveries. The analyses conducted in 2004 confirmed that the fuel-bound nitrogen content met these requirements. Compliance with the 0.30 lbs/MMBtu NO<sub>x</sub> emission standards for Boilers 6 and 7 was demonstrated by continuous emission monitoring of the flue gas. In 2004, NO<sub>x</sub> emissions from Boilers 6 and 7 averaged 0.256 lbs/MMBtu and 0.210 lbs/MMBtu, respectively, and there were no known exceedances of the NO<sub>x</sub> emission standard for either boiler.

#### 3.5.1.2 Ozone-Depleting Substances

*Refrigerants.* BNL's preventative maintenance program requires regular inspection and maintenance of refrigeration and air conditioning equipment that contains ozone-depleting substances (ODS) such as R-11, R-12, and R-22. All refrigerant recovery and recycling equipment used by trained technicians is certified to meet refrigerant evacuation levels specified by 40 CFR 82.158. As a matter of standard practice at BNL, if a refrigerant leak is found, technicians will either immediately repair the leak or isolate it and prepare a work order for the needed repairs. This practice exceeds the leak repair provisions of 40 CFR 82.156. In 2004, approximately 450 pounds of R-11, 4 pounds of R-12, and 185 pounds of R-22 were recovered and recycled from refrigeration equipment that was serviced.

*Halon.* Halon 1211 and 1301 are extremely efficient fire suppressants but are being phased out, due to their effect on the Earth's ozone

layer. In 1998, BNL purchased equipment to comply with the halon recovery and recycling requirements of the CAA, 40 CFR 82 Subpart H. When portable fire extinguishers or fixed systems are removed from service and when halon cylinders are periodically tested, BNL workers use halon recovery and recycling devices, to comply with the CAA provisions.

In July 2004, BNL successfully negotiated the transfer of excess Halon 1301 and Halon 1011 to the Department of Energy Savannah River Site ODS Repository. In total, 5,284 pounds of excess Halon 1301 and approximately 175 pounds of excess Halon 1011 were transferred. The fire suppressants sent to the ODS Repository had accumulated over several years as fixed fire suppression systems in buildings were dismantled because they were no longer needed, or as the result of ODS systems being replaced with systems that use alternative agents.

#### 3.5.2 Hazardous Air Pollutants

In 1970, the CAA established standards to protect the general public from hazardous air pollutants that may lead to death or an increase in irreversible or incapacitating illnesses. The NESHAPs were updated significantly in 1990. EPA developed a program to limit the emission of 189 toxic air pollutants. This program included a list of regulated contaminants, a schedule for implementing control requirements, aggressive technology-based emission standards, industry-specific requirements, special permitting provisions, and a program to address accidental releases. The following subsections describe BNL's compliance with NESHAPs regulations.

##### 3.5.2.1 Maximum Available Control Technology

During preparation of the Title V Phase II application, BNL reviewed existing state and federal regulations administered under the CAA to determine applicability to BNL activities and operations. Based on this review, it was concluded that no proposed or promulgated Maximum Available Control Technology (MACT) standards apply to BNL operations. Additional evaluation conducted in 2004 determined that no MACT standards apply to the anticipated emissions from proposed activities or operations.

### 3.5.2.2 Asbestos

As required, BNL provided notice to the EPA Region II office regarding the removal of materials that contained asbestos. During 2004, 1,116 linear ft of asbestos-containing pipe insulation, 7,495 ft<sup>2</sup> of asbestos-containing surface material (siding, roofing, and vinyl asbestos floor tile removed during demolition or renovation activities), and 400 yd<sup>3</sup> of bulk asbestos waste (generated during demolition of facilities) were removed and disposed of in accordance with EPA requirements.

### 3.5.2.3 Radioactive Airborne Emissions

Emissions of radiological contaminants are evaluated and, if necessary, monitored to ensure that they do not impact the environment or people residing near BNL. A full description of this monitoring in 2004 is provided in Chapter 4. BNL transmitted all data pertaining to radioactive air emissions and dose calculations to EPA on schedule, in fulfillment of the June 30 annual reporting requirement. In 2004, the maximum off-site dose due to airborne radioactive emissions from BNL continued to be far below the 10 mrem (100  $\mu$ Sv) annual dose limit specified in 40 CFR 61 Subpart H. See Chapters 4 and 8 for more information on the estimated air dose. The dose to the hypothetical maximally exposed individual (MEI) resulting from airborne emissions, calculated using EPA's modeling software, was 0.043 mrem (0.43  $\mu$ Sv).

## 3.6 CLEAN WATER ACT

The disposal of wastewater generated by BNL operations is regulated under the Clean Water Act (CWA), as implemented by NYSDEC and under DOE Order 5400.5, *Radiation Protection of the Public and the Environment*. The goals of the CWA are to achieve a level of water quality that promotes the propagation of fish, shellfish, and wildlife; to provide waters suitable for recreational purposes; and to eliminate the discharge of pollutants into surface waters. New York State was delegated CWA authority in 1975. NYSDEC has issued a SPDES permit to regulate wastewater effluents at BNL. This permit establishes release concentration limits and specifies monitoring requirements.

The BNL SPDES permit was modified in February 2004. This permit provides monitoring requirements and specifies effluent limits for nine of 13 outfalls, as described below. See Figure 5-6 in Chapter 5 for the locations of BNL outfalls.

- Outfall 001 is used for the discharge of the treated effluent from the STP to the Peconic River.
- Outfalls 002, 002B, 003, 005, 006A, 006B, 008, 010, 011, and 012 are recharge basins used to discharge cooling tower blowdown, once-through cooling water, and/or stormwater. NYSDEC does not require BNL to monitor Outfalls 003, 011, and 012.
- Outfall 007 receives backwash water from the potable Water Treatment Plant filter building.
- Outfall 009 consists of numerous subsurface and surface wastewater disposal systems that receive predominantly sanitary waste, and steam- and air-compressor condensate discharges. NYSDEC does not require monitoring of this outfall.

Each month, BNL prepares Discharge Monitoring Reports that detail monitoring data, evaluate compliance with permit limitations, and identify corrective measures taken to address permit excursions. Reports are submitted directly to the NYSDEC central and regional offices and the Suffolk County Department of Health Services (SCDHS). Details of the monitoring program conducted for the groundwater treatment and SPDES Equivalency performance are provided in Volume II of the SER, *Groundwater Status Report*.

### 3.6.1 Sewage Treatment Plant

Sanitary and process wastewater generated by BNL operations is conveyed to the STP for processing before discharge to the Peconic River. The STP provides tertiary treatment of this wastewater (settlement/sedimentation, biological reduction of organic matter, and reduction of nitrogen). Chapter 5 provides a detailed description of the treatment process.

A summary of the SPDES monitoring results for the STP discharge at Outfall 001 is provided in Table 3-3. The relevant SPDES permit limits

Table 3-3. Analytical Results for Wastewater Discharges to Sewage Treatment Plant Outfall 001.

Analyte	Lowest Reported	Highest Reported	Min. Monitoring Frequency	SPDES Limit	No. of Exceedances	% Compliance*
Max. temperature (°F)	48	84	Daily	90	0	100
pH (SU)	5.9	7.7	Continuous Recorder	Min. 5.8	0	100
Avg. 5-day BOD (mg/L)	< 2	< 2	Twice Monthly	10	0	100
Max. 5-day BOD (mg/L)	< 2	< 2	Twice Monthly	20	0	100
% BOD removal	> 94	> 99	Monthly	85	0	100
Avg. TSS (mg/L)	< 1.0	14 (a,c)	Monthly	10	1	92
Max. TSS (mg/L)	< 1.0	18	Twice Monthly	20	0	100
% TSS removal	> 82 (a,c)	> 99	Monthly	85	1	92
Settleable solids (ml/L)	0.0	0.0	Daily	0.1	0	100
Ammonia nitrogen (mg/L)	< 0.10	0.6	Twice Monthly	2	0	100
Total nitrogen (mg/L)	3.3	9.9	Twice Monthly	10	0	100
Total phosphorus (mg/L)	0.37	2.3	Twice Monthly	NA	0	100
Cyanide (µg/L)	< 5.0	18.7	Twice Monthly	100	0	100
Copper (mg/L)	0.035	0.057	Twice Monthly	0.15	0	100
Iron (mg/L)	0.10	0.87(b,c)	Twice Monthly	0.37	2	92
Lead (mg/L)	< 0.0030	0.0074	Twice Monthly	0.019	0	100
Nickel (mg/L)	0.0034	0.024	Twice Monthly	0.11	0	100
Silver (mg/L)	0.0016	0.0054	Twice Monthly	0.015	0	100
Zinc (mg/L)	0.03	0.1	Twice Monthly	0.1	0	100
Mercury (mg/L)	< 0.0002	0.0002	Twice Monthly	0.0008	0	100
Toluene (µg/L)	< 1.0	< 5.0	Twice Monthly	5	0	100
Methylene chloride (µg/L)	< 1.0	11.0 (d)	Twice Monthly	5	2	92
1,1,1-trichloroethane (µg/L)	< 1.0	< 5.0	Twice Monthly	5	0	100
2-butanone (µg/L)	< 2.0	9.8	Twice Monthly	50	0	100
PCBs (µg/L)	< 0.065	< 0.65	Quarterly	NA	0	100
Max. flow (MGD)	0.31	0.67	Continuous Recorder	2.3	0	100
Avg. flow (MGD)	0.25	0.49	Continuous Recorder	NA	0	100
Avg. fecal coliform (MPN/100 mL)	< 2	2	Twice Monthly	200	0	100
Max. fecal coliform (MPN/100 mL)	< 2	2	Twice Monthly	400	0	100

## Notes:

See Chapter 5, Figure 5-6 for location of Outfall 001.

\*% Compliance = [(total no. samples – total no. exceedances) / total no. of samples] x 100

BOD = Biological Oxygen Demand

MGD = Million Gallons per Day

MPN = Most Probable Number

NA = Not Applicable

SU = Standard Unit

TSS = Total Suspended Solids

- (a) Two composite samples collected on June 4 and June 7, 2004, exhibited total suspended solids concentrations of 18 and 10 mg/L respectively. Due to the elevated concentrations, the average TSS concentration and the calculated percent removal exceeded the permit limits.
- (b) Two permit exceedances of the total iron concentration occurred on June 4 and June 7, 2004.
- (c) An investigation into the exceedances found that the sample collection probe was lying on the bottom of the flow channel and was likely collecting sediment.
- (d) Grab samples collected on April 2, 2004 and May 3, 2004 exceeded the permit limits. An investigation found that the analytical laboratory performing these analyses had a solvent contamination problem, and therefore the exceedances are not real.

are also shown. BNL monitors the STP discharge for more than 100 parameters monthly and more than 200 parameters quarterly. BNL's compliance with effluent limits was greater than 99 percent overall. There were six excursions of

the SPDES permit limits for this outfall in 2004: two for methylene chloride, two for iron, and one each for suspended solids, and suspended solids removal. Each of these excursions was investigated, as follows.

In April and May, methylene chloride was detected in the discharge at 7 and 11 µg/L, respectively. Because methylene chloride is a common laboratory contaminant, cross contamination at the analytical lab was suspected. To check this, BNL sent blank samples (containing no contamination) for analysis. All the blank samples were reported to contain methylene chloride. A subsequent evaluation by the contract laboratory showed cross contamination occurring at their facility. A copy of their assessment was provided to NYSDEC. In June, two samples showed high levels of iron and suspended solids. Examination of the sampling equipment showed that when the sample collection tubing was replaced, the end probe was put on the bottom of the channel, where it collected settled particulates. Repositioning the probe midstream showed the levels of iron and suspended solids to be lower and well within permit limits. Because the concentration of suspended solids was high in the original effluent sample, removal of 85 percent of the incoming solids could not be demonstrated. Figures 3-1 through 3-7 plot 5-year trends for the maximum monthly concentrations of copper, iron, lead, mercury, nickel, silver, and zinc in the STP discharge.

3.6.1.1 Chronic Toxicity Testing

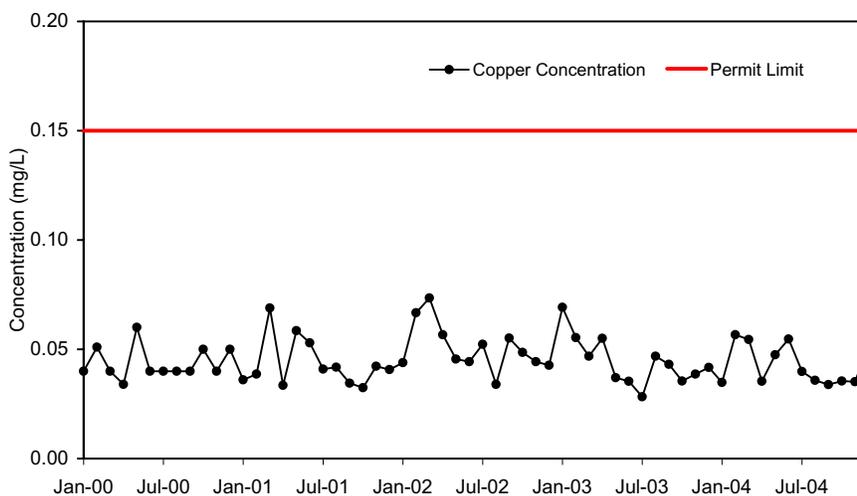
BNL’s SPDES permit requires that “whole effluent toxicity” (WET) tests be conducted to ensure that chemicals present in the STP efflu-

ent are not toxic to aquatic organisms. BNL’s chronic toxicity testing program began in 1993 and continued through 2003. In 2004, toxicity testing was postponed and will be restarted in March 2005 as stipulated in the February 2004 SPDES permit modification. Under the WET testing provisions, samples are collected and tested quarterly. The program consists of 7-day chronic toxicity testing on two freshwater organisms, water fleas and fathead minnows. Sets of 10 of these organisms are exposed to varying concentrations of the STP effluent (100, 50, 25, 12.5, and 6.25 percent) for 7 days in each test. During testing, the growth rate of the fish and rate of reproduction for the water flea are measured and compared to untreated organisms (i.e., controls). The test results are submitted to NYSDEC for review.

3.6.2 Recharge Basins and Stormwater

Outfalls 002 through 008 and Outfalls 010 through 012 discharge to groundwater, replenishing the underlying aquifer. Monitoring requirements for each of these discharges vary, depending on the type of wastewater received and the type of cooling water treatment reagents used. Table 3-4 summarizes the monitoring requirements and performance results for 2004. Review of the data shows that all discharges were in full compliance with SPDES requirements. No permit excursions were recorded at any of these outfalls in 2004.

Figure 3-1. Maximum Concentrations of Copper Discharged from the BNL Sewage Treatment Plant, 2000–2004.



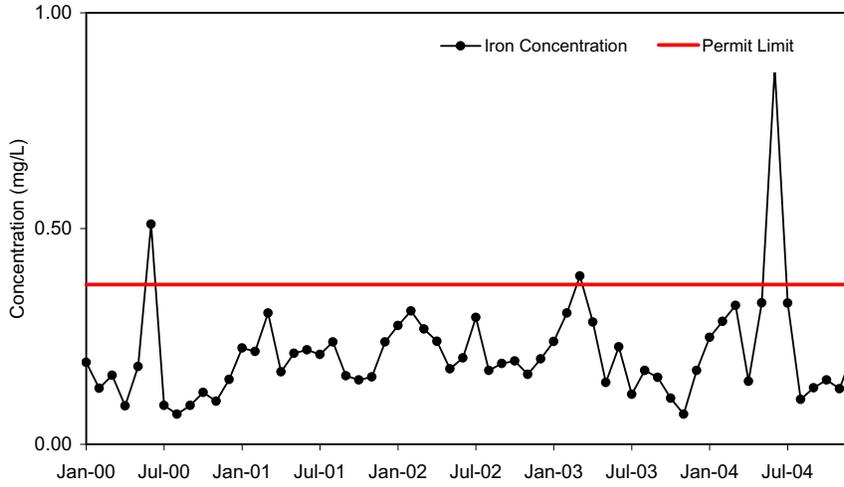


Figure 3-2. Maximum Concentrations of Iron Discharged from the BNL Sewage Treatment Plant, 2000–2004.

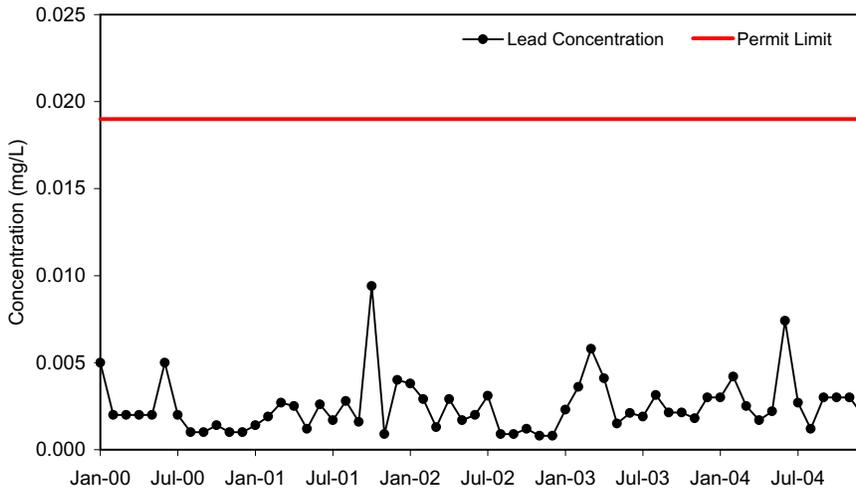


Figure 3-3. Maximum Concentrations of Lead Discharged from the BNL Sewage Treatment Plant, 2000–2004.

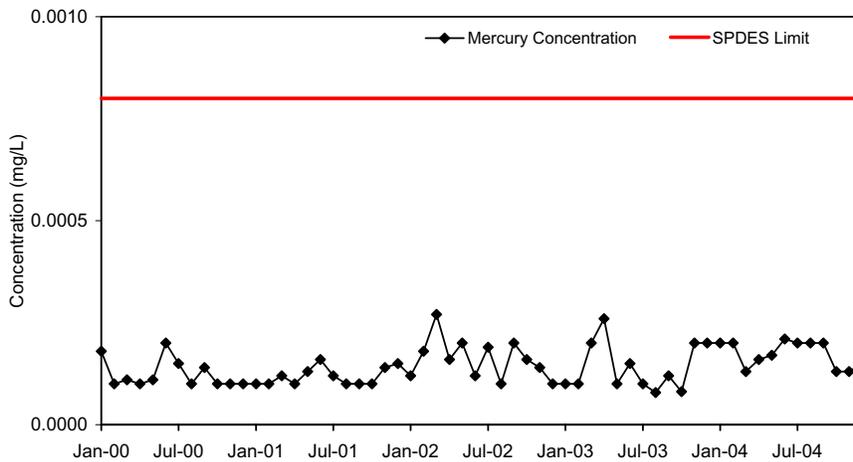
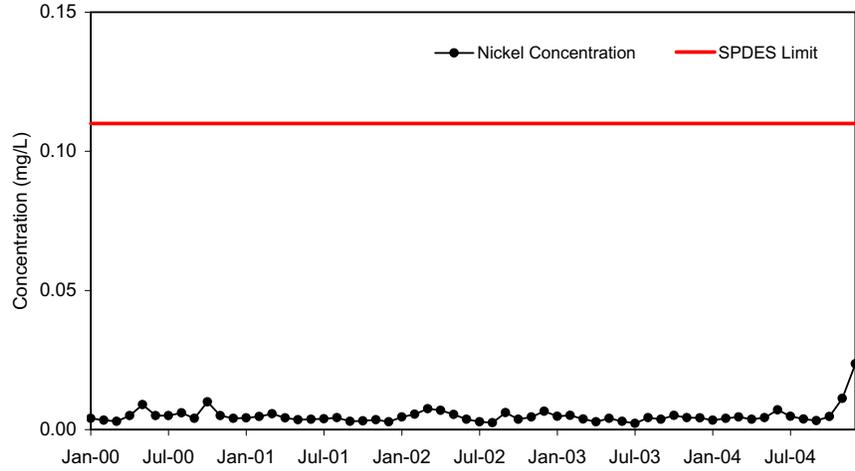
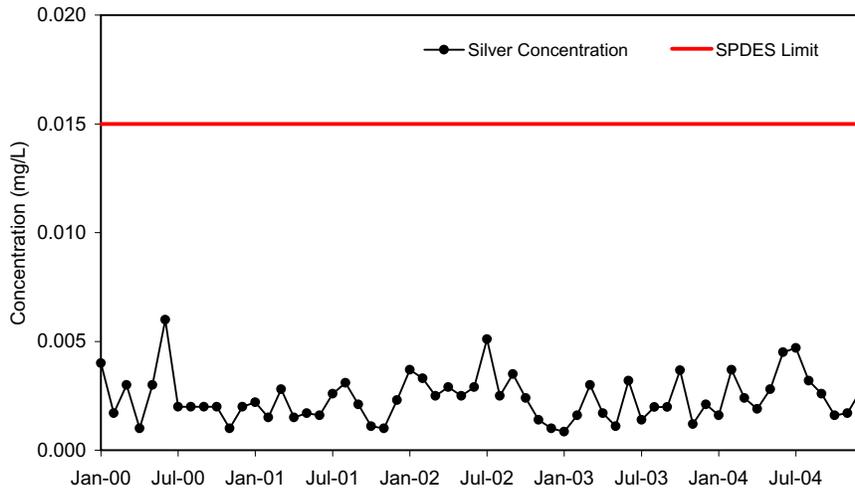


Figure 3-4. Maximum Concentration of Mercury Discharged from the BNL Sewage Treatment Plant, 2000–2004.

**Figure 3-5. Maximum Concentration of Nickel Discharged from the BNL Sewage Treatment Plant, 2000–2004.**



**Figure 3-6. Maximum Concentration of Silver Discharged from the BNL Sewage Treatment Plant, 2000–2004.**



**Figure 3-7. Maximum Concentration of Zinc Discharged from the BNL Sewage Treatment Plant, 2000–2004.**

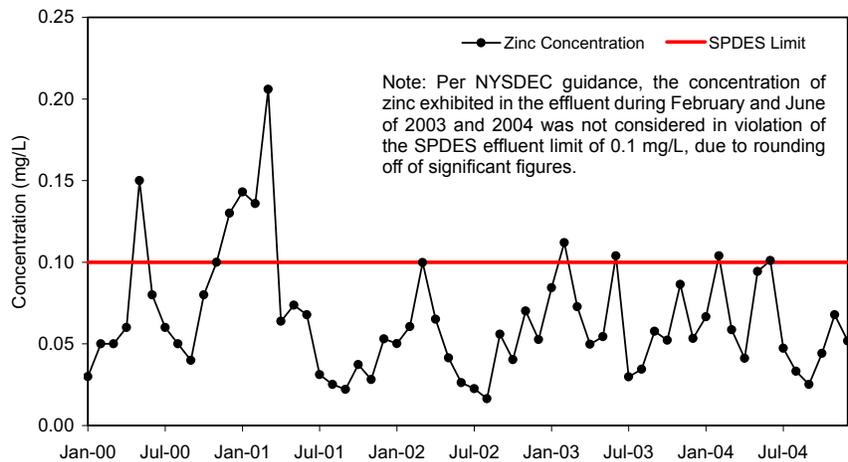


Table 3-4. Analytical Results for Wastewater Discharges to Outfalls 002–008 and 010.

Analyte	Outfall 002	Outfall 002B	Outfall 005	Outfall 006A	Outfall 006B	Outfall 007	Outfall 008	Outfall 010	SPDES Limit	No. of Exceedances	% Compliance*
Flow (MGD)	N	CR	CR	CR	CR	CR	11	10			
	Min.	0.02	0.0002	0.24	0.03	0.006	0.16	0.001	NPL		
	Max.	0.26	0.054	0.77	0.16	0.43	0.40	0.23	NPL	NA	NA
pH (SU)	Min.	6.5	7.1	6.7	6.9	6.2	6.1	6.6	NA		
	Max.	8.4	8.6	8.5	8.5	8.5	8.4	8.1	8.5, 9.0 (a)	0	100
Oil and grease (mg/L)	N	12	11	12	10	NR	10	10			
	Min.	< 5.0	< 5.0	< 5.0	< 5.0	NR	< 5.0	< 5.0	NA		
	Max.	< 5.0	4.1	< 5.0	< 5.0	NR	6.1	3.3	15	0	100
Copper (mg/L)	N	NR	NR	4	NR	NR	NR	4			
	Min.	NR	NR	< 0.01	NR	NR	NR	< 0.01	NA		
	Max.	NR	NR	0.006	NR	NR	NR	0.005	1.0	0	100
Aluminum (mg/L)	N	4	NR	NR	NR	NR	4	4			
	Min.	< 0.05	NR	NR	NR	NR	< 0.05	< 0.05	NA		
	Max.	0.67	NR	NR	NR	NR	0.03	0.15	2.0	0	100
Lead (mg/L)	N	NR	NR	NR	NR	NR	NR	4			
	Min.	NR	NR	NR	NR	NR	NR	< 0.003	NA		
	Max.	NR	NR	NR	NR	NR	NR	0.002	0.05	0	100
Vanadium (mg/L)	N	NR	NR	NR	NR	NR	NR	4			
	Min.	NR	NR	NR	NR	NR	NR	0.003	NA		
	Max.	NR	NR	NR	NR	NR	NR	0.013	NPL	NA	NA
Chloroform (µg/L)	N	4	NR	NR	NR	NR	NR	NR			
	Min.	< 1.0	NR	NR	NR	NR	NR	NR	NA		
	Max.	0.51	NR	NR	NR	NR	NR	NR	7	0	100
Bromo-dichloromethane (µg/L)	N	4	NR	NR	NR	NR	NR	NR			
	Min.	< 1.0	NR	NR	NR	NR	NR	NR	NA		
	Max.	< 1.0	NR	NR	NR	NR	NR	NR	5	0	100

(continued on next page)

Table 3-4. Analytical Results for Wastewater Discharges to Outfalls 002–008 and 010 (concluded).

Analyte	Outfall 002	Outfall 002B	Outfall 005	Outfall 006A	Outfall 006B	Outfall 007	Outfall 008	Outfall 010	SPDES Limit	No. of Exceedances	% Compliance*
1,1,1-trichloroethane (µg/L)	N	4	NR	NR	NR	NR	4	NR			
	Min.	< 1.0	NR	NR	NR	NR	< 1.0	NR	NA	NA	
	Max.	< 1.0	NR	NR	NR	NR	< 5.0	NR	5	0	100
1,1-dichloroethylene (µg/L)	N	NR	NR	NR	NR	NR	4	NR			
	Min.	NR	NR	NR	NR	NR	< 1.0	NR	NA	NA	
	Max.	NR	NR	NR	NR	NR	< 5.0	NR	5	0	100
Hydroxyethylidene-diphosphonic acid (mg/L)	N	4	4	4	4	NR	NR	NR			
	Min.	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	NR	NA	NA	
	Max.	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	NR	0.5	0	100
Tolyltriazole (mg/L)	N	4	4	4	4	NR	NR	NR			
	Min.	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	NR	NA	NA	
	Max.	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	NR	0.2	0	100

Notes:  
 See Chapter 5, Figure 5-6 for locations of outfalls.  
 There are no monitoring requirements for Outfalls 009, 011, and 012.  
 \*% Compliance = [(total no. samples – total no. exceedances)/total no. of samples] x 100  
 CR = Continuous Recorder  
 MGD = Million Gallons per Day  
 Max. = Maximum value  
 Min. = Minimum value

N = Number of samples  
 NA = Not Applicable  
 NPL = No permit limit, monitoring only  
 NR = Analysis Not Required  
 SU = Standard Unit  
 (a) pH limit is 8.5 for Outfalls 005, 008, and 010. pH limit is 9.0 for Outfalls 002, 002B, 003, 006A, 006B, and 007.

**3.7 SAFE DRINKING WATER ACT**

The distribution and supply of drinking water is regulated under the federal SDWA. In New York State, implementation of the SDWA is delegated to the New York State Department of Health (NYSDOH) and administered by SCDHS. Because BNL provides potable water to “more than 25 full-time residents,” it is subject to the same requirements as a public water supplier. Monitoring requirements are prescribed annually by SCDHS, and a *Potable Water Sampling and Analysis Plan* (Chaloupka 2004) is prepared to comply with these requirements.

**3.7.1 Potable Water**

BNL maintains six groundwater wells for on-site distribution of potable water. To meet New York State Drinking Water Standards (DWS), groundwater is treated with activated carbon or air stripping to remove volatile organic compounds (VOCs). Groundwater from three of the six wells is also treated to reduce naturally occurring iron. As required by NYSDOH regulations, BNL monitors the potable wells regularly for bacteria, inorganics, organics, and pesticides. BNL also voluntarily monitors drinking water supplies for radiological contaminants. Tables 3-5 and 3-6 provide the potable water supply monitoring data for 2004. Color and iron exceeded DWS in samples collected from three of the wells (wells 4, 6, and 7), before distribution. Treatment at the Water Treatment Plant effectively re-

duced these levels to below DWS. At the point of consumption, drinking water complied with all DWS during 2004. Chapter 7 provides additional data on environmental surveillance tests performed on potable wells. This additional testing goes beyond the minimum SDWA testing requirements.

### 3.7.2 Cross-Connection Control

The SDWA requires that public water suppliers implement practices to protect the water supply from sanitary hazards. One of the safety requirements is to rigorously prevent connections between the potable water supply and connections to systems containing hazardous substances (“cross connections”). Cross-connection control is the installation of control devices (e.g., double check valves, reduced pressure zone valves, etc.) at the interface between a facility and the domestic water main. Cross-connection control devices are required at all facilities where hazardous materials are used in a manner that could result in their introduction

into the domestic water system, especially under low-pressure conditions. In addition, secondary cross-connection controls at the point of use are recommended, to protect users within a specific facility from hazards that might be posed by intra-facility operations.

BNL has installed and maintains approximately 200 cross-connection control devices at interfaces to the potable water main, and secondary control devices at the point of use. Approximately 175 cross-connection control units were tested in 2004, including primary and secondary devices. If a problem is encountered during testing, the device is repaired and retested to ensure proper function. In 2004, no cross-contamination problems were reported.

### 3.7.3 Underground Injection Control

UIC wells are regulated under the SDWA. At BNL, UICs include drywells, cesspools, septic tanks, and leaching pools, all of which are classified by EPA as Class V injection wells. Proper management of UIC devices is vital for protect-

Table 3-5. Potable Water Wells and Potable Distribution System: Analytical Results (Maximum Concentration, Minimum pH Value).

Compound	Well No. 4	Well No. 6	Well No. 7	Well No. 10	Well No. 11	Well No. 12	Potable Distribution Sample	NYS DWS
<b>Water Quality Indicators</b>								
Total coliform	ND	ND	ND	ND	ND	ND	ND	Negative
Color (units)	50*	< 5	< 5	< 5	< 5	< 5	< 5	15
Odor (units)	0	0	0	0	0	0	0	3
Cyanide (µg/L)	NA	< 10	< 10	< 10	< 10	< 10	< 10	SNS
Conductivity (µmhos/cm)	146	129	148	102	272	256	251	SNS
Chlorides (mg/L)	NA	22.5	21.9	10.8	17.8	18.3	25.7	250
Sulfates (mg/L)	NA	9.9	9.8	8.4	12.7	11.5	10.1	250
Nitrates (mg/L)	NA	0.15	0.15	< 0.10	0.46	0.49	0.26	10
Nitrites (mg/L)	NA	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.10	1.0
Ammonia (mg/L)	NA	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	SNS
pH (Standard Units)	5.9	6.0	5.9	6.1	6.0	6.1	6.5	SNS
MBAS (mg/L)	NA	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	SNS
<b>Metals</b>								
Antimony (µg/L)	NA	< 5.90	< 5.90	< 5.90	< 5.90	< 5.90	< 5.90	6.0
Arsenic (µg/L)	NA	< 3.00	< 3.00	< 3.00	< 3.00	< 3.00	< 3.00	50

(continued on next page)

**Table 3-5. Potable Water Wells and Potable Distribution System: Analytical Results (Maximum Concentration, Minimum pH Value).**

Compound	Well No. 4	Well No. 6	Well No. 7	Well No. 10	Well No. 11	Well No. 12	Potable Distribution Sample	NYS DWS
Barium (mg/L)	NA	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	2.0
Beryllium (µg/L)	NA	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	4.0
Cadmium (µg/L)	NA	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	5.0
Chromium (mg/L)	NA	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	0.1
Fluoride (mg/L)	NA	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	2.2
Iron (mg/L)	NA	4.33*	1.82*	0.044	< 0.02	0.025	0.150	0.3
Lead (µg/L)	NA	< 1.0	< 1.0	< 1.0	< 1.0	2.54	1.60	15
Manganese (mg/L)	NA	0.094	0.063	< 0.010	< 0.010	< 0.010	0.21	0.3
Mercury (µg/L)	NA	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.30	2.0
Nickel (mg/L)	NA	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	SNS
Selenium (µg/L)	NA	< 5.00	< 5.00	< 5.00	< 5.00	< 5.00	< 5.00	50.0
Sodium (mg/L)	NA	12.8	14.1	11.1	14.0	13.7	17.6	SNS
Silver (µg/L)	NA	< 10	< 10	< 10	< 10	< 10	< 10	100
Thallium (µg/L)	NA	< 1.90	< 1.90	< 1.90	< 1.90	< 1.90	< 1.90	2.0
Zinc (mg/L)	NA	< 0.020	< 0.020	< 0.020	< 0.020	0.034	< 0.020	5.0
<b>Radioactivity</b>								
Gross alpha activity (pCi/L)	NA	< 1.7	< 1.5	NA	< 1.4	< 1.6	NR	15.0
Gross beta activity (pCi/L)	NA	2.2 ± 1.2	< 1.8	NA	< 1.9	2.4 ± 1.3	NR	(a)
Tritium (pCi/L)	NA	< 310	< 310	NA	< 310	340	NR	20,000
Strontium-90 (pCi/L)	NA	< 0.89	< 0.74	NA	< 0.80	< 0.78	NR	8.0
<b>Other</b>								
Asbestos (Million fibers/L)	NR	NR	NR	NR	NR	NR	< 0.17	7
Calcium (mg/L)	5.48	4.77	5.47	5.09	6.30	7.10	10.2	SNS
Alkalinity (mg/L)	11.6	8.4	12.2	20.3	17.3	21.4	48.2	SNS
Residual chlorine - MRDL (mg/L)	NR	NR	NR	NR	NR	NR	0.8	4.0
TTHM (mg/L)	NR	NR	NR	NR	NR	NR	0.01	0.08**
HAA5 (mg/L)	NR	NR	NR	NR	NR	NR	0.01	0.06**

**Notes:**

See Figure 7-3 for well locations.

HAA5 = Five Haloacetic Acids

MBAS = Methylene Blue Active Substances

MRDL = Maximum Residual Disinfectant Level

NA = Not Analyzed due to well shutdown in April 2004

ND = Not Detected

NR = Analysis Not Required

NYS DWS = New York State Drinking Water Standard

SNS = Drinking Water Standard Not Specified

TTHM = Total Trihalomethanes

\* Water from these wells is treated at the Water Treatment Plant for color and iron reduction prior to site distribution.

\*\* Limit imposed on distribution samples only.

(a) The drinking water standard was changed from 50 pCi/L (concentration based) to 4 mrem/yr (dose based) in late 2003. Since gross beta activity does not identify specific radionuclides, a dose equivalent can not be calculated for the values in the table.

**Table 3-6. Potable Water Wells: Analytical Results for Principal Organic Compounds, Synthetic Organic Chemicals, Pesticides, and Micro-Extractables (Maximum Concentration).**

Compound	WTP Effluent	Well No. 4	Well No. 6	Well No. 7	Well No. 10	Well No. 11	Well No. 12	NYS DWS
Dichlorodifluoromethane	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
Chloromethane	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
Vinyl Chloride	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	2
Bromomethane	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
Chloroethane	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
Trichlorofluoromethane	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
1,1-dichloroethene	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
Methylene Chloride	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
trans-1,2-dichloroethene	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
1,1-dichloroethane	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
cis-1,2-dichloroethene	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
2,2-dichloropropane	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
Bromochloromethane	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
1,1,1-trichloroethane	0.6	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
Carbon Tetrachloride	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
1,1-dichloropropene	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
1,2-dichloroethane	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
Trichloroethene	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
1,2-dichloropropane	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
Dibromomethane	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
trans-1,3-dichloropropene	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
cis-1,3-dichloropropene	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
1,1,2-trichloroethane	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
1,3-dichloropropane	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
Chlorobenzene	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
1,1,1,2-tetrachloroethane	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
Bromobenzene	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
1,2,3-trichloropropane	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
2-chlorotoluene	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
4-chlorotoluene	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
1,3-dichlorobenzene	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
1,4-dichlorobenzene	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
1,2-dichlorobenzene	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
1,2,4-trichlorobenzene	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
Hexachlorobutadiene	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5

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**Table 3-6. Potable Water Wells: Analytical Results for Principal Organic Compounds, Synthetic Organic Chemicals, Pesticides, and Micro-Extractables (Maximum Concentration) (continued).**

Compound	WTP Effluent	Well No. 4	Well No. 6	Well No. 7	Well No. 10	Well No. 11	Well No. 12	NYS DWS
Tetrachloroethene	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
1,1,2,2-Tetrachloroethane	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
1,2,3-trichlorobenzene	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
Benzene	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
Toluene	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
Ethylbenzene	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
m,p-xylene	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
o-xylene	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
Styrene	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
Isopropylbenzene	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
n-propylbenzene	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
1,3,5-trimethylbenzene	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
tert-butylbenzene	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
1,2,4-trimethylbenzene	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
sec-butylbenzene	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
4-Isopropyltoluene	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
n-butylbenzene	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
Methyl tert-butyl ether	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	50
Lindane	NR	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	0.2
Heptachlor	NR	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	0.4
Aldrin	NR	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
Heptachlor Epoxide	NR	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	0.2
Dieldrin	NR	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
Endrin	NR	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	0.2
Methoxychlor	NR	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	40
Toxaphene	NR	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	3
Chlordane	NR	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	2
Total PCBs	NR	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	0.5
2,4,5,-TP (Silvex)	NR	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	10
Dinoseb	NR	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	50
Dalapon	NR	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	50
Picloram	NR	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	50
Dicamba	NR	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	50
Pentachlorophenol	NR	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	1
Hexachlorocyclopentadiene	NR	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5

(continued on next page)

**Table 3-6. Potable Water Wells: Analytical Results for Principal Organic Compounds, Synthetic Organic Chemicals, Pesticides, and Micro-Extractables (Maximum Concentration) (continued).**

Compound	WTP Effluent	Well No. 4	Well No. 6	Well No. 7	Well No. 10	Well No. 11	Well No. 12	NYS DWS
Bis(2-ethylhexyl)Phthalate	NR	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	50
Bis(2-ethylhexyl)Adipate	NR	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	50
Hexachlorobenzene	NR	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
Benzo(A)Pyrene	NR	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	50
Aldicarb Sulfone	NR	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	SNS
Aldicarb Sulfoxide	NR	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	SNS
Aldicarb	NR	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	SNS
Oxamyl	NR	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	50
3-Hydroxycarbofuran	NR	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	50
Carbofuran	NR	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	40
Carbaryl	NR	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	50
Methomyl	NR	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	50
Glyphosate	NR	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	50
Diquat	NR	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	50
1,2-dibromomethane (EDB)	NR	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	0.05
1,2-dibromoethane	NR	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	0.05
1,2-dibromo-3-chloropropane	NR	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	0.2
2,4,-D	NR	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	50
Alachlor	NR	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	2
Simazine	NR	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	50
Atrazine	NR	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	3
Metolachlor	NR	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	50
Metribuzin	NR	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	50
Butachlor	NR	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	50
Endothall	NR	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	100
Propachlor	NR	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	50
Chloroform	NR	40	1.0	1.2	1.6	<MDL	<MDL	50
Bromodichloromethane	<MDL	2.8	<MDL	<MDL	1.0	<MDL	<MDL	50
Dibromochloromethane	< MDL	0.5	<MDL	< MDL	0.6	< MDL	< MDL	50
Bromoform	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	50

**Notes:**

See Chapter 7, Figure 7-3 for well locations.

For compliance determination with New York State Department of Health standards, potable water samples were analyzed quarterly or annually depending on the analyte by H2M Labs Inc., a New York State-certified contractor laboratory.

The minimum detection limits for principal organic compound analytes are 0.5 µg/L. Minimum detection limits for synthetic organic chemicals and micro-extractables are compound-specific, and in all cases are less than the New York State Department of Health drinking water standard.

&lt; MDL = Less than the Minimum Detection Limit for the analyte in question

NR = Analysis Not Required

SNS = Drinking Water Standard Not Specified

NYS DWS = New York State Drinking Water Standard

WTP = Water Treatment Plant

ing underground sources of drinking water. In New York State, the UIC program is implemented through EPA, since NYSDEC did not adopt UIC regulatory requirements. (New York State regulates discharges of pollutants to cesspools under the SPDES program.) Under EPA's UIC program, all Class V injection wells must be included in an inventory maintained with the agency. There were no changes to the BNL UIC inventory in 2004.

In addition to the UICs maintained for routine Laboratory discharges of sanitary waste and stormwater, UICs also are maintained at several on- and off-site treatment facilities used for groundwater remediation. Contaminated groundwater is treated and then returned to the aquifer via drywells, injection wells, or recharge basins. Discharges to UICs are regulated by EPA, and a separate inventory is maintained for these treatment facilities.

**3.8 SPILL PREVENTION, EMERGENCY PLANNING, AND REPORTING**

Several federal, state, and local regulations address the management of storage facilities containing chemicals, petroleum, and other hazardous materials. These regulations include specifications for storage facilities, requirements for release planning documentation, and release reporting. The following subsections describe BNL's compliance with these regulations.

**3.8.1 Preventing Oil Pollution and Spills**

BNL must maintain a *Spill Prevention Control and Countermeasures Plan* (Chaloupka 2000) (SPCC Plan) as a condition of its Major Petroleum Facility License and as required by the Oil Pollution Act. This plan is part of BNL's emergency preparedness program and outlines mitigating and remedial actions that would be taken in the event of a major petroleum release. The plan also provides information regarding

release prevention measures, the design of storage facilities, and maps detailing their locations. The SPCC Plan is filed with NYSDEC, EPA, and DOE, and was last updated in December 2000. In July 2002, EPA adopted significant changes to the SPCC regulations, which extended the requirements to previously unregulated facilities and provided some relief to existing covered facilities. These changes, among others, included extending the plan update deadline from 3 to 5 years, and specifying that containers less than 55 gallons need not be counted toward reaching SPCC applicability. The timeline for updating BNL's SPCC Plan to incorporate these changes has therefore been extended until February 2006, and BNL is proceeding with changes to the plan. The revised plan must be implemented by August 2006. BNL remained in full compliance with the SPCC requirements in 2004.

BNL also maintains a *Facility Response Plan* (Lee 2002). The Facility Response Plan (FRP) outlines emergency response procedures to be implemented in the event of a worst-case discharge of oil. There were no comments from EPA regarding revisions to the FRP submitted in September 2002; consequently there were no actions on the FRP in 2004.

**3.8.2 Local and State Emergency Reporting Requirements**

The Emergency Planning and Community Right-to-Know Act (EPCRA) and Title III of the Superfund Amendments and Reauthorization Act (SARA) require that facilities report inventories and releases of certain chemicals that exceed specific thresholds to the local emergency planning committee and the state emergency response commission. Community Right-to-Know requirements are codified under 40 CFR Parts 355, 370, and 372. The table below summarizes the applicability of the regulations to BNL.

Applicability of EPCRA to BNL				
EPCRA 302-303	Planning Notification	YES [X]	NO [ ]	NOT REQUIRED [ ]
EPCRA 304	EHS Release Notification	YES [ ]	NO [ ]	NOT REQUIRED [X]
EPCRA 311-312	MSDS/Chemical Inventory	YES [X]	NO [ ]	NOT REQUIRED [ ]
EPCRA 313	TRI Reporting	YES [X]	NO [ ]	NOT REQUIRED [ ]

BNL complied with these requirements in 2004 through the submittal of reports under EPCRA Sections 302, 303, 311, and 312. During 2000 and 2001, the Part 313 Toxic Release Inventory (TRI) thresholds were significantly lowered for mercury, PCBs, and lead. Mercury and PCB thresholds were lowered from 10,000 pounds to 10 pounds, and lead from 10,000 to 100 pounds. In addition to these three classes of contaminants, review of EPA guidance regarding the reporting requirements for other “persistent, bioaccumulative, and toxic” chemicals (PBTs) was reviewed and two additional classes of chemicals were identified for reporting in 2004: benzo(g,h,i)perylene, and polycyclic aromatic compounds. These two classes of compounds are associated with the combustion of fuel oil and the paving of roads. Emissions estimates for these classes were based on EPA-published emission factors. In 2004, BNL submitted Tier III reports for lead (~ 165,000 pounds), mercury (~ 600 pounds), PCBs (~ 57 pounds), benzo(g,h,i)perylene (< 1 pound), and polycyclic aromatic compounds (< 1 pound). In 2004, there were no releases of “extremely hazardous substances” that are reported under Part 304.

### 3.8.3 Spills and Releases

When a spill of hazardous material occurs, BNL personnel are required to immediately notify the on-site Fire Rescue Group, whose members are trained to respond to such releases. The initial step in spill response is to contain and control any release and to notify additional response personnel (i.e., BNL environmental professionals, industrial hygienists, etc.). Environmental professionals reporting to the scene assess the spill for environmental impact and determine if it is reportable to regulatory agencies. Any release of petroleum products to soil is reportable to both NYSDEC and SCDHS, and any release impacting a surface water is also reportable to the EPA National Response Center. In addition, releases of petroleum products in volumes greater than 5 gallons to impermeable surfaces or containment areas are also reported to NYSDEC and SCDHS. Spills of chemicals in quantities greater than CERCLA-reportable quantities are reportable to the

EPA National Response Center, NYSDEC, and SCDHS. Remediation of the spill is conducted, as necessary, to restore the site.

During 2004, there were 76 spills, of which 30 met external agency reporting criteria. The 30 reports are summarized in Table 3-7. The remaining 46 releases were small-volume releases either to containment areas or to other impermeable surfaces that did not exceed a reportable quantity. Nineteen of the 30 reported releases involved very small volumes (< 5 gallons) of petroleum products that reached soil. New York State has a “zero tolerance” level for releases of petroleum products to soil or water; consequently, spills of any amount to soil are reportable. Four of the 30 were small-volume releases of ethylene glycol from engine coolant leaks. There were seven large-volume (i.e., > 10 gallons) releases recorded in 2004. Two of the seven were petroleum releases discovered during tank removal projects, two were associated with failed equipment at the Brookhaven Linear Isotope Producer that released water containing low-levels of radioactivity into secondary containment, two were releases of oils associated with failed equipment, and one was the release of PCB-contaminated oil from two transformers that were knocked over in a storage yard by an unknown cause. Table 3-7 contains a summary of each of these incidents, including a description of the cause, corrective actions taken, and whether the spill was reportable to DOE through the Occurrence Reporting and Processing System (ORPS).

In 2004, there were 13 incidents reported through ORPS that were environmental in nature. Six of these reports were spill-related and have been summarized in Table 3-7; the remaining seven are summarized in Table 3-8. All incidents were addressed through the identification and implementation of corrective actions geared toward the root cause. No off-site or on-site permanent environmental impacts arose from the ORPS-reported incidents.

### 3.8.4 Major Petroleum Facility License

The storage of 2.3 million gallons of petroleum products (principally No. 6 fuel oil) subjects BNL to Major Petroleum Facility licensing by NYSDEC. BNL maintains an MPF license for

storing and transferring oil at the Central Steam Facility. During 2004, BNL remained in full compliance with license requirements. The license requires BNL to monitor groundwater in the vicinity of the six active, aboveground storage tanks that range in size from 300,000 to 600,000 gallons. The license also requires that BNL inspect storage facilities monthly and test the systems for leak detection, high-level monitoring, and secondary containment. Tank integrity is also checked periodically. Groundwater monitoring consists of monthly checks for floating products and twice-yearly analyses for volatile and semivolatile organic compounds. In 2004, no contaminants or floating products

attributable to MPF activities were found in the downgradient groundwater wells. See Volume II of the SER, *Groundwater Status Report*, for additional information on groundwater monitoring results.

The following upgrades and/or inspections were performed at the Laboratory's Major Petroleum Facility in 2004:

- Internal "out-of-service" API 653 inspections were performed on all six aboveground storage facilities. Any deficiencies identified as part of the inspections were repaired in accordance with best engineering judgment and industry-accepted practices. Copies of the final inspection reports were

**Table 3-7. Summary of Chemical and Oil Spill Reports.**

Spill No. and Date	Material and Quantity	ORPS Report	Source/Cause and Corrective Actions
04-01 1/10/04	Transmission Fluid 1 gal	No	A BNL employee notified Fire Rescue of a ~1 gal spill of transmission fluid from an employee vehicle in front of Building 488. The spill was on pavement and partially on soil in the area of the parking space. Spill absorbent was placed on the affected areas and BNL's Plant Engineering (EP) personnel collected and containerized the spill absorbent and affected soil, for off-site disposal.
04-06 2/6/04	Ethylene Glycol 1 gal	Yes* (CH-BNL-BNL-2004-0001)	A BNL employee was driving westbound on Princeton Avenue (unpaved portion) after completing a sampling event. The employee slowed to ~ 25 mph and applied the brake to enter a sharp curve. Due to unseen ice on the roadway, the employee was unable to steer the vehicle and it slid directly into a tree resulting in a spill of ~ 1 gal of antifreeze. Spill absorbent was placed on the affected areas and EP personnel collected and containerized the spill absorbent for off-site disposal.
04-08 2/27/04	Unknown Oil 1 gal	No	BNL employees performing a weekly flow chart exchange at recharge basin HZ noticed a darkening of the soil in two areas. Because a crane had previously been parked over the area of the spill, it was assumed to be the source. Although the exact material released is unknown, it is assumed to be a type of oil. EP personnel responded and removed the contaminated soil for off-site disposal.
04-12 3/1/04	Engine Oil 0.5 gal	No	An empty 5-gal container with an open nozzle was found on the grass in front of Building 919B. The manufacturer's label read "Black Bear Company Inc. Motor Oil." Grass and soil around the container had black stains. The contaminated grass and soil were excavated until no visible oil-stained soil and no residual petroleum odors remained. Approximately 2.5 ft <sup>3</sup> of soil was removed by EP personnel for off-site disposal.
04-14 3/8/04	Ethylene Glycol 1 gal	Yes* (CH-BH-BNL-PE-2004-0001)	During repair of the heater block on the emergency generator for Building 488, EP personnel reported a spill of ~ 1 gal (4 lb.) of a 50/50 mix of ethylene glycol and water onto the lower platform, concrete pad, and nearby soil. A deteriorated cooling system hose caused the spill. EP personnel used spill absorbent and containerized it along with the affected soil for off-site disposal.
04-17 3/23/04	Mineral Oil 2 gal	No	Near Building 919, a primary bushing on a transformer (# 912-TRNF-170, 631-5-11) released ~2 gal of mineral oil onto the concrete pad and into the adjacent rocky soil. EP personnel discovered the spill during a routine inspection. They removed the contaminated soil and rock ballast, and containerized it for off-site disposal.
04-18 3/24/04	Mineral Oil 1 gal	No	During routine transformer inspection, a leaking gauge was discovered. EP personnel immediately repaired the leaking gauge fitting and put spill absorbent on the concrete below. They removed the stained rock along with the spill absorbent for off-site disposal.
04-19 3/23/04	Compressor Oil 10 gal	No	The refrigeration compressor in Building 902 shut down. When Cryogenic Group personnel investigated, they discovered that a failed seal on the compressor had released ~ 10 gal of oil to the building. The room had been equipped with an angle iron berm to prevent the release of oil to the outdoors in the event of such an incident. The berm proved to be better than 95 percent effective, with some minor oil weeps evident along the building edge. These were resealed to prevent future releases. Cryogenic Group personnel applied several bags of spill absorbent, which was containerized for off-site disposal.

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Table 3-7. Summary of Chemical and Oil Spill Reports (continued).

Spill No. and Date	Material and Quantity	ORPS Report	Source/Cause and Corrective Actions
04-22 4/8/04	Transmission Fluid 1 cup	No	A privately owned vehicle had transmission failure and released transmission fluid on the asphalt just east of the Upton/Cornell intersection. Due to the early morning traffic and for safety reasons, the vehicle was moved to the grassy soil beside the road. This resulted in a release of ~ 8 oz. of fluid to soil. Spill absorbent was placed under the vehicle and on the affected soil. EP personnel cleaned the spill and removed the contaminated soil for off-site disposal.
04-24 4/26/04	Transformer Oil 19 gal	Yes* (CH-BH-BNL- PE-2004- 0003)	During a rainstorm, an EP employee noticed an oily sheen on Bell Ave., south of Building 452 and found two transformers knocked over. One transformer had lost all its contents (15 gal) and the second transformer lost ~ 4 gal. Oil had crossed the road and entered the storm drain. Fire Rescue diked the storm drains and laid down oil absorbent, but an oil sheen was evident on the stormwater run-off channel adjacent to Grove St. Placing an oil absorbent boom across the channel prevented discharge to a wetland area south of Grove St. The booms were changed several times while the spill was remediated. Analysis of the oil showed it to be contaminated with PCBs. Cleanup was conducted following EPA requirements. Closeout of the incident is pending.
04-25 4/28/04	Cooling Water (Activated) 260 gal	No	The BLIP Target vessel contains ~ 300 gal of cooling water that routinely becomes activated through use. Due to localized Linac beam drift, a beam window flange on this vessel failed, allowing a ~ 260 gal release of cooling water to secondary containment (the outer vessel). The contained cooling water was pumped into US DOT-approved containers for proper off-site disposal. There were no measurable releases of cooling water to the environment and the spilled radionuclide inventory did not exceed CERCLA or State reportable quantities; the spill to containment was deemed nonreportable to EPA and NYSDEC. Because the amount of water spilled into secondary containment exceeded 5 gal, the spill was reportable to SCDHS.
04-26 5/6/04	Diesel fuel 0.5 gal	No	An environmental cleanup contractor rented a trailer-mounted diesel-powered centrifugal pump for the Peconic River cleanup project. The pump was staged on a grassy area near the worksite. An increase in daytime temperature caused expansion in the full fuel tank, releasing ~ 0.5 gal of fuel. The contractor put down adsorbent pads and a 5-gal container to capture the liquids coming from the fuel tank, but some had already contacted the grass below. The contractor removed the affected grass and any soil that had traces (odor or visual) of fuel. These materials were containerized and disposed of off-site.
04-28 5/8/04	Cooling Water (activated) 280 gal	No	See Spill No. 04-25 for details, as this spill was identical. Activated water was again removed from the secondary containment structure and transferred to DOT-approved containers for off-site disposal. After this incident and an extensive investigation, the cause of the beam drift was identified and additional equipment and safeguards were put in place to prevent recurrence.
04-31 5/17/04	Ethylene Glycol 1 gal	Yes* (CH-BH-BNL- PE-2004- 0004)	After turning onto South Harvard St., the operator of a forklift (#109917) realized that a mechanical problem had occurred and stopped on the edge of the road across from Building 479. Inspection revealed a failed water pump. Approximately 1 gal of an ethylene glycol and water mix had been released to the roadway and nearby soil. Absorbent pads were immediately put under the forklift. The forklift was taken for repair and the affected soil was removed for off-site disposal.
04-32 5/20/04	Hydraulic Fluid 2 pints	No	An environmental contractor for the Peconic River cleanup was using an excavator to remove surface sediment from the riverbed. Failure of an o-ring on the hydraulic system of the excavator resulted in a loss of hydraulic fluid to a 20 x 5 ft. section of the riverbed. The excavator was immediately moved over the adjacent roadway onto plastic, and absorbent material was placed below it to catch any leaking fluid. Sand bags were placed in the riverbed to prevent the introduction of more water to this section, and multiple absorbent booms were used to remove the 2 pints of fluid released. The booms were containerized for proper disposal. During a follow-up inspection by NYSDEC, the following conditions were placed on the restoration project work in the Peconic River. 1) To help prevent a release of petroleum from diesel/gasoline powered dewatering pumps, a secondary containment system was employed and properly maintained under all pumps at all times. 2) To help contain a release and prevent future impacts, an absorbent boom was pre-deployed at the downstream dewatering pump discharge point at all times and regularly inspected, maintained, and changed as necessary. 3) All proactive measures were to be implemented immediately, remain in place, and become part of the Spill Prevention Plan through project completion.
04-35 6/1/04	Hydraulic Fluid 1 gal	No	A loose hose fitting from a hydraulic cylinder of a 30-ton Terex dump truck released ~ 1 gal of hydraulic fluid onto soil. Absorbent pads were immediately placed on the spill area. The top layer of soil where the spill occurred was removed and placed on plastic sheeting. The soil was containerized for off-site disposal.

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CHAPTER 3: COMPLIANCE STATUS

Table 3-7. Summary of Chemical and Oil Spill Reports (continued).

Spill No. and Date	Material and Quantity	ORPS Report	Source/Cause and Corrective Actions
04-37 6/9/04	Hydraulic Fluid < 1gal	No	A vacuum pump has an exhaust leading out of the rear of Building 1005E. An in-line mist eliminator is part of the system to capture any residual oil that accumulates during exhausting. The mist eliminator had become oversaturated during operation and released less than 1 gal of oil through the exhaust. The oil saturated the soil underneath the exhaust point. EP personnel remediated the area by collecting and containerizing the oily soil for off-site disposal.
04-43 7/1/04	Hydraulic Fluid 0.25 gal	No	A contractor-owned excavator struck a tree branch, rupturing a hydraulic line. Less than 0.25 gal of hydraulic fluid spilled onto the soil near Building 815. Absorbent pads were immediately placed on the spill area by Fire Rescue. The soil was removed by the contractor and placed in a 55-gal drum. BNL arranged for off-site disposal of the soil.
04-44 7/8/04	Diesel Fuel < 1 gal	No	A BNL employee walking in the area of the Peconic River cleanup noticed soil discoloration beneath the trailer carriage of a portable diesel generator that was being used by a contractor as a power source. The employee alerted Fire Rescue to the spill, which was probably caused by expansion of fuel in the generator tank after it had been filled. Contractor personnel dug out a 3- x 5-ft. area under the trailer carriage, removing all visibly contaminated soil. The waste was stored in large polyethylene bags and transported to a staging area for transfer to 55-gal drums. BNL arranged for off-site disposal of the soil.
04-45 7/12/04	Hydraulic Fluid < 0.5 cups	No	An excavator that had been used in the Peconic River cleanup was on the east firebreak road awaiting return to the leasing company. A BNL employee passing by noticed a small stained area in the sand near the base of the unit, and notified Fire Rescue. Absorbent pads were used to clean the excavator undercarriage stained from the leaking hydraulic line. The contaminated soil was shoveled into a 3-gal pail for proper off-site disposal. The excavator was returned to the leasing company later that day.
04-48 7/20/04	Hydraulic Fluid 1 pint	No	During the Peconic River cleanup, a contractor-operated excavator released hydraulic fluid into ponded Peconic River water (in a dewatered area) and onto sediment. The spill was caused by the failure of a rubber o-ring on a hydraulic line. Booms were placed on the ponded water and pads were put below the leaking hydraulic line. The o-ring was replaced after the line was fully drained. Pads, booms, and associated debris were bagged and repacked into drums for off-site disposal.
04-56 9/16/04	Fuel Oil 4 gal	No	During the planned removal of an Underground Storage Tank (UST) on the north side of Building T-87, several small holes were observed on the side of the tank. A Sanitary Engineer from SCDHS observed the tank's removal. It was set aside and the excavation was inspected. SCDHS provided oversight during the removal of contaminated soil, checking for contamination (sniff and water sheen) until clean soil was encountered. A total of ~ 4 yd <sup>3</sup> of soil was removed and disposed of. SCDHS determined that all contaminated soil had been removed and that end point samples were not necessary. The excavation was backfilled.
04-57 9/17/04	Fuel Oil 65 gal	Yes* (CH-BH-BNL-PE-2004-0005)	During a planned UST removal on the south side of Building 244, at least one dime-sized hole was observed on the bottom of the tank. A SCDHS Sanitary Engineer observing the tank's removal also oversaw the removal of contaminated soil, checking it for contamination (sniff and water sheen) until the depth of the excavation (~ 15 ft) and proximity of the building made further soil removal unwise. One soil sample collected from the bottom of the excavation confirmed that not all of the contamination had been removed, but a Geoprobe investigation of the tank area showed no impacts above state and county action levels. A total of approximately 40 yd <sup>3</sup> of soil was removed from the excavation for off-site disposal.
04-58 9/24/04	Hydraulic Fluid < 1 pint	No	Hydraulic fluid was observed leaking from a manlift as it was parked along the railroad track. Inspection of the unit revealed the hydraulic fluid was leaking from a twisted ¾-in. hydraulic line. Plastic was placed beneath the manlift and contractor personnel scraped up the contaminated soil beneath the manlift and along the railroad. Contaminated soil and absorbent rags that were used to clean the chassis of the manlift were placed in containers for off-site disposal. The damaged manlift was transported off site for repairs.
04-59 9/22/04	Fuel Oil 90 gal	Yes* (CH-BH-BNL-PE-2004-0005)	During a planned UST removal on the south side of Building 339, significant contamination was discovered near the tank's fill and vent lines. In addition, at least one small hole was observed on the bottom of the tank. SCDHS and NYSDEC observed tank removal and inspected the excavation, examining the soil for contamination (sniff and water sheen) until the depth of the excavation (~ 14 ft) and proximity of the building prevented further soil from being removed. It appeared that clean soil was reached on the bottom and sidewalls of the excavation. To confirm this, three soil samples were collected and analyzed for volatile and semivolatile organic compounds. Analytical results showed remaining soils to be less than state and county action levels. In total, ~ 50 yd <sup>3</sup> of soil were removed and properly disposed.

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Table 3-7. Summary of Chemical and Oil Spill Reports (concluded).

Spill No. and Date	Material and Quantity	ORPS Report	Source/Cause and Corrective Actions
04-60 9/27/04	Oil/Degreaser < 1 cup	No	Oil sheen was observed on water run-off near Buildings 326 and 423, the EP Heavy Equipment Mechanic Operator Shop. The cause of the oil sheen was determined to be residual oil (hydraulic or diesel) on the frame of a New Holland skid steer that was being washed down as part of a preventive maintenance action. The water runoff had made its way to the catch basin on the southeast corner of Building 326 that discharges into the woods south of the building. Absorbent pads and an absorbent sock were used to contain contaminated runoff and absorb residual water/oil. The skid steer's oil, hydraulic, and coolant reservoirs were checked and there was no noticeable loss of fluids. Therefore, residual oils on the frame of the unit were seen as the likely source of the sheen. Remedial actions included using a wet vacuum to suction the small pool of water containing the residual oil and degreaser (Simple Green). The bottom of the catch basin was cleaned with absorbent pads and the contaminated soil at the point of discharge in the wooded area was manually excavated by EP personnel. Analytical results on soil samples showed no exceedance of county action levels. All contaminated absorbents and soils were disposed of off site.
04-64 10/12/04	Diesel Fuel ~ 1 pint	No	While EP personnel were preparing equipment for the winter, they discovered that one of the smaller farm tractors, primarily used for snow clearing, had leaked a small amount of diesel fuel on the ground. The date and time of the spill is unknown, but the cause of the leak was most likely from fuel in the tank expanding during the summer. The spill site was cleaned up. Most of the contamination was concentrated in the grass and leaves below the tractor. Approximately 1 to 2 in. of impacted soil were removed and contaminated material was collected for off-site disposal.
04-66 10/22/04	Ethylene Glycol solution 1 gal	Yes* (CH-BH-BNL-BNL-2004-0021)	A BNL employee was transferring a 5-gal plastic container of 50/50 ethylene glycol and water to a laboratory in Building 815. The container was transported in the bed of a pick-up truck and in secondary containment. However, when the container was lifted by the handle, it ruptured, releasing 1 gal of the glycol mixture. Most landed on the concrete pad and was contained with spill absorbent. A small quantity spilled onto the cab of the truck and onto the ground. It is estimated that < 1 lb (i.e., < 1/2 lb glycol) spilled onto soil. EP personnel cleaned up the material and containerized it for off-site disposal.
04-72 12/10/04	Engine Oil 2 – 3 quarts	No	Contractor workers noticed a fuel film on soil after their contract fuel company delivered fuel to their equipment. The contractor suspected the source was the departing fuel truck and stopped the truck at the corner of Brookhaven Ave. and Power Line Rd. He confirmed that the fuel delivery truck was leaking motor oil and placed absorbent pads under the truck to capture any further drips. A light oil film was observed on the soil in several locations around the truck and a more substantial area (~2 x 3 ft) was observed on the soil adjacent to the truck. The contractor cleaned up the spill and BNL disposed of the contaminated material.
04-73 12/17/04	Oil/Water mixture 120 gal	No	BNL staff drained and replenished the Citranox tank in the Central Cleaning facility. Approximately 275 gal of cleaning solution were transferred to the Coolant Recycling Facility for processing in the Water Eater. The operator of the Coolant Recycling Facility began processing the Citranox Solution to evaporate the water at ~ 1530 hrs using the Water Eater autofill cycle, then left the facility. A considerable volume of tramp oil was already in the Water Eater tank from a batch of Blasocut 2000 Coolant that had been previously processed. As the Citranox was heated to 212 °F, the water in solution began to boil. The boiling liquid caused a water/oil foam to form and spill over the top of the tank. When this foam hit the cold steel floor in the building, it condensed, producing steam. After liquid in the tank dropped below the autofill low-level line, the pump automatically activated, causing more Citranox to be dispensed into the tank, repeating the cycle. Eventually, enough steam was produced to set off a heat detector that, in turn, activated an alarm in Building 479 to alert Fire Rescue. They immediately responded, as did the site supervisor on duty. When the door to Building 495 was opened, there was ~ 3 in. of oil/water on the floor. Power to the Water Eater tank was cut. All of the oil/water was fully contained within the building's secondary containment. Using a wet vacuum, workers recovered ~ 130 gal of oil/water and placed it in drums for off-site disposal.

## Notes:

\* Release is reportable to DOE under the requirements of DOE Order 231.1A, Occurrence Reporting and Processing.  
BLIP = Brookhaven Linear Isotope Producer  
CERCLA = Comprehensive Environmental Response, Compensation and Liability Act  
DOT = Department of Transportation

NYSDEC = New York State Department of Environmental Conservation  
PCBs = PolyChlorinated Biphenyls  
SCDHS = Suffolk County Department of Health Services  
UST = Underground Storage Tank  
PVC = Polyvinyl chloride

**Table 3-8. Summary of Other BNL Environmental Occurrence Reports.\***

<p><b>ORPS ID:</b> CH-BH-BNL-BNL-2004-0002</p> <p>The New York State Department of Environmental Conservation (NYSDEC) issued a Notice of Violation for deficiencies noted during a January 5 unannounced inspection of BNL's Hazardous Waste Program. Three administrative issues were identified during this inspection, all related to the labeling of hazardous/universal waste.</p>	<p><b>Date:</b> 2/13/04</p> <p><b>Status:</b> Closed. All corrective actions have been completed.</p>
<p><b>ORPS ID:</b> CH-BH-BNL-BNL-2004-0008</p> <p>A small volume of radiologically contaminated water leaked from a transport container being used at the Brookhaven Graphite Research Reactor (BGRR) decommissioning project. Although no Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) or State reporting limits were exceeded, the ORPS report was issued due to transportation concerns.</p>	<p><b>Date:</b> 5/05/04</p> <p><b>Status:</b> Closed. All corrective actions have been completed.</p>
<p><b>ORPS ID:</b> CH-BH-BNL-BNL-2004-0012</p> <p>A package containing radioactive waste en route to Envirocare of Utah was found leaking at a rest stop in Western Pennsylvania. Radiological Control technicians from the Susquehanna Power Plant conducted smear surveys of the container and liquid. No contamination was evident on the exterior of the package or in the collected water. It was determined that rainwater had accumulated in a welded support channel that subsequently leaked to the bed of the trailer.</p>	<p><b>Date:</b> 6/29/04</p> <p><b>Status:</b> Closed. There were no corrective actions identified.</p>
<p><b>ORPS ID:</b> CH-BH-BNL-PE-2004-0013</p> <p>A package containing radioactive waste en route to Envirocare of Utah was found to be leaking during an inspection by the transporter during a stop in Green River, Wyoming. The package contained low-level radioactive brine from a geothermal well that had been solidified using a commercial solidification agent. Though no active leak was evident during inspection by the local enforcement agency, smears collected by DOE's Radiological Assistance Program confirmed low-level detections of radiological contaminants on the truck trailer. The package was repaired and overpacked to prevent further release and sent on to Envirocare for disposal. The truck trailer was cleaned and released. There was no detectable contamination on the road beneath the trailer. Evaluation of the incident revealed that the spill resulted from insufficient solidification of the waste, which resulted in leakage through the liners. Corrective Actions include performance of benchtop testing of all solidification processes and performance testing of liners to ensure that they are watertight.</p>	<p><b>Date:</b> 7/28/04</p> <p><b>Status:</b> Open. Two corrective actions remain open.</p>
<p><b>ORPS ID:</b> CH-BH-BNL-BNL-2004-0016</p> <p>On 9/4/04, 37 train cars derailed near Utica, New York due to a track problem. One of the railcars contained nonhazardous, nonradioactive soils excavated as part of the Peconic River project that were en route to a disposal facility near Niagara Falls, New York. The transportation company assumed all responsibility for repackaging the waste and shipping it to the disposal facility. BNL staff confirmed that all waste was repackaged and shipped.</p>	<p><b>Date:</b> 9/10/04</p> <p><b>Status:</b> Closed. All corrective actions have been completed.</p>
<p><b>ORPS ID:</b> CH-BH-BNL-PE-2004-0023</p> <p>A graduate student working in the Medical Department disposed of water potentially containing trace levels of FI-18 to a sink drain. This was a violation of the posted Radiological Work Permit and resulted in issuance of a Radiological Awareness Report. Investigation showed there was no release of radionuclides.</p>	<p><b>Date:</b> 11/01/04</p> <p><b>Status:</b> Closed. All corrective actions have been completed.</p>
<p><b>ORPS ID:</b> CH-BH-BNL-BNL-2004-0027</p> <p>On 12/7/04, NYSDEC conducted a second inspection of BNL's Hazardous Waste Program and issued a second Notice of Violation for the mishandling of universal wastes. Specifically, waste fluorescent light bulbs were not stored in proper containers, and were not labeled in accordance with universal waste rules.</p>	<p><b>Date:</b> 12/23/04</p> <p><b>Status:</b> Closed. All corrective actions have been completed.</p>

\*All events reportable under the Occurrence Reporting and Processing System (ORPS), established by the requirements of DOE Order 231.1A.

- submitted to NYSDEC and SCDHS in May.
- Tanks No. 5 and No. 6 were placed back in service in May after completion of upgrades to the fuel oil piping and cathodic protection electrical circuits.
- An existing 60,000-gallon No. 2 fuel oil tank (Tank No. 12) was emptied and all piping was removed, in preparation for placing

- the tank permanently out of service.
- The 2004 NYSDEC annual inspection was conducted in August. The inspection noted four conditions that required corrective action: one related to the management of vegetative growth in the secondary containment berms at Building 610, one related to the remote high-level alarm and tank gauge

system inside the Central Steam Facility Steam Plant Control Room, one for peeling and blistering paint on the roof plates and piping associated with Tanks No. 5 and No. 6, and one related to a previously repaired failure of the concrete containment area at Building 326. All conditions are being corrected in accordance with NYSDEC directives.

### 3.8.5 Chemical Bulk Storage

Title 6 of the *Official Compilation of the Codes, Rules and Regulations of the State of New York* (NYCRR), Part 597, requires registration with NYSDEC of all aboveground tanks larger than 185 gallons and all underground tanks that store specific chemical substances. BNL holds a Hazardous Substance Bulk Storage Registration Certificate for eight tanks. Seven of the tanks store potable water treatment chemicals (sodium hydroxide and sodium hypochlorite) and one tank stores gallium trichloride, formerly required in physics experiments. The tanks range in size from 200 to 1,200 gallons. These tanks are also regulated under *Suffolk County Sanitary Code Article 12* (SCDHS 1993) and are managed in accordance with BNL procedures designed to conform to Suffolk County requirements.

NYSDEC conducted an inspection of the Chemical Bulk Storage (CBS) facilities in August 2004. During this inspection, only one issue required corrective action: an existing floor drain in the Building 624 hypochlorite storage room must be plugged during normal operations to prevent an uncontrolled release of product. This issue was corrected in accordance with the NYSDEC directive.

### 3.8.6 County Storage Requirements

Article 12 of the Suffolk County Sanitary Code, administered by SCDHS, regulates the storage and handling of toxic and hazardous materials in aboveground or underground storage tanks (USTs), drum storage facilities, piping systems, and transfer areas. Article 12 specifies design criteria to prevent environmental impacts resulting from spills or leaks. It also specifies administrative requirements, such as

identification, registration, and spill reporting procedures. In 1987, BNL entered into a voluntary Memorandum of Agreement (MOA) with SCDHS, in which DOE and BNL agreed to conform to the environmental requirements of Article 12.

Currently, BNL has approximately 430 active storage facilities listed in the Suffolk County Tanks Database. Also included in the county database are another 24 storage facilities associated with environmental restoration activities conducted under the CERCLA program; these facilities are not regulated under Article 12. BNL storage facilities listed in the database include those storing fuel (some of which are also regulated under the MPF license), wastewater, and chemicals, as well as storage facilities used to support Laboratory research.

BNL has an ongoing program to upgrade or replace existing storage facilities and to meet with representatives of SCDHS to ensure that the information provided for all registered storage facilities is accurate and that new or modified storage facilities are designed and reviewed for full conformance with Article 12 regulations.

In 2004, a project was funded to remove and replace the final three unprotected, single-walled USTs at BNL. The USTs were successfully removed from the ground in September 2004 and replaced with three new aboveground storage tanks that meet the Article 12 minimum design standards. In addition, BNL prepared design submittals and project descriptions, and coordinated several inspections with SCDHS that resulted in the Laboratory receiving approximately 75 "Permits to Operate." These permits indicate that the registered storage facility was approved, inspected, and built according to the requirements of Article 12.

## 3.9 RESOURCE CONSERVATION AND RECOVERY ACT

RCRA regulates hazardous wastes that, if mismanaged, could present risks to human health or the environment. The regulations are designed to ensure that hazardous wastes are managed from the point of generation to final disposal. In New York State, EPA delegates

the RCRA program to NYSDEC, with EPA retaining an oversight role. BNL is considered a large-quantity generator because it may generate greater than 1,000 kg of hazardous waste in a month and has a RCRA permit to store hazardous wastes for 1 year before shipment off site to licensed treatment and disposal facilities. BNL has a number of satellite accumulation and 90-day storage areas.

NYSDEC conducted two inspections of BNL hazardous waste management operations in 2004, one in January and one in December. A Notice of Violation (NOV) was issued as a result of each inspection. The January NOV identified several waste batteries and a bag of waste solder that were not properly labeled. The December NOV identified some waste fluorescent light bulbs being managed as universal waste that were not properly packaged and labeled. In each instance, the violations were corrected to the satisfaction of NYSDEC before the conclusion of the inspection, thus requiring no further actions by BNL.

Mixed wastes are materials that are both hazardous (under RCRA guidelines) and radioactive. The Federal Facilities Compliance Act (FFCA), issued in 1992, requires that DOE work with local regulators to develop a site treatment plan to manage mixed waste. Development of the plan has two purposes: to identify available treatment technologies and disposal facilities (DOE or commercial) that are able to manage mixed waste produced at federal facilities, and to develop a schedule for treating and disposing of these waste streams.

BNL updates the *BNL Site Treatment Plan (1997)* annually and submits it to NYSDEC. The updated plan documents the current mixed waste inventory and describes efforts undertaken to seek new commercial treatment and disposal outlets for various waste streams. Treatment options for all of the mixed waste now in storage have been identified, and most of the current inventory was shipped off site for treatment and disposal in 2004. BNL expects to ship the remainder of those mixed wastes in storage covered by the plan in early 2005. This will enable BNL to terminate its consent order with NYSDEC pertaining to this plan and

continue to manage mixed wastes within its permitted time frame of 1 year.

### 3.10 POLYCHLORINATED BIPHENYLS

The storage, handling, and use of PCBs are regulated under the Toxic Substance and Control Act (TSCA). Capacitors manufactured before 1970 that are believed to be oil filled are handled as if they contain PCBs, even when the existence of PCBs cannot be verified through an investigation of the manufacturer's records. All equipment containing PCBs must be inventoried, except for capacitors containing less than 3 pounds of dielectric fluid and items with a concentration of PCB source material of less than 50 parts per million. The PCB inventory is updated by July 1 of each year. All PCB-containing articles or PCB-contaminated equipment must be labeled. BNL responds to any PCB spill in accordance with standard emergency response procedures. BNL was in compliance with TSCA requirements in 2004 and reduced its PCB inventory by approximately 42 percent, including the draining of a 100-gallon regulator in Building 901 and disposal of several large capacitors from the Collider-Accelerator Department.

### 3.11 PESTICIDES

The storage and application of pesticides (insecticides, rodenticides, herbicides, and algicides) are regulated under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA). Pesticides at BNL are used to control undesirable insects, mice, and rats; to control bacteria in cooling towers; and to maintain certain areas free of vegetation (e.g., around fire hydrants and inside secondary containment berms). Insecticides are also applied to agricultural research fields and in greenhouses on site. Herbicide use is minimized wherever possible (e.g., through spot treatment of weeds). All pesticides are applied by BNL-employed New York State-certified applicators. By February 1, each applicator files an annual report with NYSDEC detailing insecticide, rodenticide, algicide, and herbicide use for the previous year. BNL was in full compliance with FIFRA requirements in 2004.

### 3.12 WETLANDS AND RIVER PERMITS

As noted in Chapter 1, portions of the BNL site are situated on the Peconic River floodplain. Portions of the Peconic River are listed by NYSDEC as scenic under the Wild, Scenic, and Recreational River Systems Act. BNL also has six areas regulated as wetlands and a number of vernal (seasonal) pools. Construction or modification activities performed within these areas require permits from NYSDEC.

Activities that could require review under the BNL Natural and Cultural Resource Management Programs are identified during the NEPA process (see Section 3.3). In the preliminary design stages of a construction project, design details required for the permit application process are specified. These design details ensure that the construction activity will not negatively affect the area, or if it does, that the area will be restored to its original condition. When design is near completion, permit applications are filed. During and after construction, BNL must comply with the permit conditions.

In 2004, four projects were permitted under this program, all ongoing from 2003. These projects included paving the parking lots at Buildings 1002 and 1004, and constructing a new recharge basin, a storage facility at the Alternating Gradient Synchrotron, and ancillary structures at Buildings 1007 and 1009 (not begun in 2004 and likely to be canceled). Formal closure notification for the paving project was filed with NYSDEC in July. Final photos and completed project notifications for the other finished projects will be filed with NYSDEC in 2005 to close these permits.

### 3.13 ENDANGERED SPECIES ACT

In 2003, BNL updated its list of endangered, threatened, and species of special concern (see Table 6-1 in Chapter 6). An additional species was added to the list in 2004. The worm snake (*Carphophis amoenus*), a species of special concern, was found within the central moist forest area of the Laboratory.

Although the eastern tiger salamander is no longer the only state endangered species found at BNL, it is the most notable and best-studied species on site. Eastern tiger salamanders are

listed in New York State as endangered because populations have declined due to habitat loss through development, road mortality during breeding migration, introduction of predatory fish into breeding sites, historical collection for the bait and pet trade, water level fluctuations, pollution, and general disturbance of breeding sites. BNL finalized the *Natural Resource Management Plan (BNL 2003)* (NRMP) in December 2003 and began immediate implementation. One component of the new plan formalizes the strategy and actions needed to protect 22 confirmed eastern tiger salamander breeding locations identified at BNL. The strategy includes identifying and mapping habitats, monitoring breeding conditions, improving breeding sites, and controlling activities that could negatively affect breeding. A multi-year study of three ponds was begun in 2004 to gain a better understanding of the habitat needs and movements of this salamander.

The banded sunfish and swamp darter are found in the Peconic River drainage areas at BNL. Both are listed as threatened species within New York State because eastern Long Island has the only known remaining populations of these fish in New York. Measures taken or being taken by BNL to protect the banded sunfish and swamp darter and their habitat include the following:

- Eliminating, reducing, or controlling pollutant discharges
- Upgrading the STP to reduce nitrogen loading in the Peconic River (completed in 1998)
- Monitoring populations and water quality
- Maintaining adequate flow to the river to enable the fish to survive drought
- Minimizing disturbances to the river and adjacent banks

Of the three butterfly species found at BNL that are endangered, threatened, or of special concern, both the frosted elfin and persius duskywing depend on lupine, a wildflower in the pea family. In the past, a single area of lupine existed on BNL grounds. This habitat still exists and it is assumed that the butterflies are still present. The mottled duskywing prefers New Jersey Tea plant, which has not been

found at BNL. Management of habitat and surveys for the three butterflies has been added to the BNL natural and cultural resource management programs.

BNL also has 12 species that are listed as species of special concern. Such species have no protection under the state endangered species laws, but may be protected under other state and federal laws (e.g., Migratory Bird Treaty Act). New York State monitors species of special concern and manages their populations and habitats, where practical, to ensure that they do not become threatened or endangered. Species of special concern found at BNL include the mottled duskywing butterfly, marbled salamander, eastern spadefoot toad, spotted turtle, eastern box turtle, eastern hognose snake, worm snake, horned lark, whip-poor-will, vesper sparrow, grasshopper sparrow, and Cooper's hawk. The management efforts for the eastern tiger salamander also benefit the marbled salamander. At present, no additional protective measures are planned for the eastern box turtle or spotted turtle, as little activity occurs within their known habitat at BNL. Radio telemetry work on the spotted turtle was carried out in 2004 and a basic understanding of their movements and habitat needs was developed. A radio telemetry study on the eastern hognose snake continued in 2004, resulting in greater understanding of this species' habitat needs and its movement between habitats. BNL continues to evaluate bird populations as part of the management strategy outlined in the NRMP. Data concerning species of special concern are used appropriately in making management decisions regarding these species. In addition to the bird species mentioned above, 18 other bird species listed as species of special concern and two federally threatened species have been observed during spring and fall migrations.

BNL has 20 plant species protected under state law. One is an endangered plant, the crested fringed orchid; two are threatened plants, the stiff goldenrod and stargrass; and two are rare plants, the narrow-leafed bush clover and long-beaked bald-rush. The other 15 species are considered to be exploitably

vulnerable, meaning that they may become threatened or endangered if factors that result in population declines continue. These plants are currently sheltered at BNL due to the large areas of undeveloped pine barren habitat on site. Locations of these rare plants must be determined, populations estimated, and management requirements established. Management of protected plants is included in the NRMP. See Chapter 6 for more information.

### 3.14 EXTERNAL AUDITS AND OVERSIGHT

A number of federal, state, and local agencies oversee BNL activities. In 2004, BNL was inspected by federal, state, or local regulators on 12 occasions. Also in 2004, SCDHS maintained a part-time, on-site staffer who provided day-to-day oversight of BNL activities. In addition to external audits and oversight, BNL has a comprehensive self-assessment program, as described in Chapter 2.

#### 3.14.1 Inspections by Regulatory Agencies

- *Hazardous Waste.* NYSDEC conducted two RCRA/hazardous waste compliance inspections in 2004. Notices of Violation were issued during both inspections for minor administrative deficiencies that were corrected immediately.
- *Air Compliance.* NYSDEC conducted an annual inspection of the Central Steam Facility in March. No issues were identified during this inspection.
- *Potable Water.* SCDHS conducts sampling and makes annual inspections of the BNL potable water system to ensure that facilities are maintained. There were no issues identified in 2004. All sample results were within DWS, except for iron, which occurs naturally in some of the wells. As noted in Section 3.7.1, BNL treats the drinking water supply to remove iron before distribution.
- *Sewage Treatment Plant.* SCDHS conducts quarterly inspections of the BNL STP to evaluate operations and sample the effluent. In 2004, no performance or operational issues were identified during these inspections. NYSDEC conducts annual inspections of the STP. In 2004, no issues were identified.

Table 3-9. Existing Agreements and Enforcement Actions Issued to BNL, with Status.

Number	Title	Parties	Effective Date	Status
<b>Agreements</b>				
No Number.	Suffolk County Agreement	SCDHS, DOE, and BNL	Originally signed on 9/23/87	This Agreement was developed to ensure that the storage and handling of toxic and hazardous materials at BNL conform with the environmental and technical requirements of Suffolk County codes.
No Number.	FFCA on Mixed Wastes	NYSDEC and DOE	1992 (updated annually)	The Federal Facilities Compliance Act (FFCA) requires that a site treatment plan to manage mixed wastes be written and updated annually. BNL is in compliance with this requirement.
II-CERCLA-FFA-00201	Federal Facility Agreement under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) Section 120 (also known as the Interagency Agreement or "IAG" of the Environmental Restoration Program).	EPA, DOE, and NYSDEC	05/26/92	Provides the framework, including schedules, for assessing the extent of contamination and conducting the BNL cleanup. Work is performed either as an Operable Unit or a Removal Action. The IAG integrates the requirements of CERCLA, Resource Conservation and Recovery Act (RCRA), and the National Environmental Policy Act (NEPA). All IAG-scheduled milestones were met in 2004.
<b>Enforcement Actions</b>				
No Number.	Notice of Violation–RCRA	NYSDEC	02/13/04	A Notice of Violation was issued for administrative (labeling) deficiencies identified during the 2004 annual hazardous waste compliance inspection conducted by NYSDEC.
No Number.	Notice of Violation–RCRA	NYSDEC	12/23/04	A Notice of Violation was issued for universal waste handling deficiencies identified during a December 2004 hazardous waste compliance inspection conducted by NYSDEC.

## Notes:

NYSDEC = New York State Department of Environmental Conservation  
 SCDHS = Suffolk County Department of Health Services

- *Recharge Basins.* As part of SCDHS oversight, recharge basins and other SPDES outfalls are inspected periodically. In 2004, SCDHS inspected the outfalls in March and collected samples during the assessment. No issues were identified.
- *Major Petroleum Facility.* The MPF is inspected annually by NYSDEC. An inspection was conducted in July 2004. See Section 3.8.4 for a discussion of this inspection.
- *Chemical Bulk Storage Facilities.* The CBS facilities are inspected periodically by NYSDEC. This inspection was conducted in July 2004. See Section 3.8.5 for a discussion of this inspection.

### 3.14.2 Inspections by DOE

DOE Headquarters (EH-10) and the Chicago Operations Office did not conduct assessments

of the Laboratory's environmental programs in 2004. However, the DOE Brookhaven Site Office (BHSO) continued to oversee BNL programs and observed programmatic assessments of the liquid effluents management program, the transfer of Facility Review Disposition Project issues, and an internal hazardous waste compliance assessment. The results of these three assessments are summarized in the paragraphs below.

#### 3.14.2.1 Liquid Effluents Self-Assessment

From May 3 to May 21, 2004, the Environmental and Waste Management Services Division (EWMSD) conducted a self-assessment of the Laboratory's wastewater management practices, compliance with federal and state regulatory requirements, and past performance of the SPDES program. This assessment was conducted as part of the EWMSD self-assess-

ment program and included DOE BHSO observation. The last liquid effluents assessment was conducted in 2001.

The assessment reviewed liquid effluent management practices across most departments and divisions and included documentation review, data verification (routine and nonroutine discharge databases), field observations of liquid discharge processes, and interviews with line personnel. The assessment found three Noteworthy Practices, two Nonconformances, six Observations, and five Opportunities for Improvement. None of the items presented immediate threats to the environment, and corrective actions were implemented to prevent potential releases to the environment and to correct potential noncompliance issues.

#### 3.14.2.2 Hazardous Waste Management

From July 7 to August 5, 2004, EWMSD conducted a self-assessment of the Laboratory's hazardous waste management practices, compliance with federal and state regulatory requirements, and past performance of the RCRA Program. This assessment was conducted as part of the EWMSD self-assessment program and included DOE BHSO observation.

The findings indicated that there were issues throughout the complex with regard to waste labeling, waste characterizations, training, and waste container management. To address these findings and identify root causes for repeat violations, an interdepartmental team was formed to improve the entire waste management process. The recommendations of the team are scheduled to be published in early 2005.

#### 3.14.2.3 Facility Review Disposition Project – Review of Transferred Issues

In 2004, EWMSD conducted a self-assessment on the current status of the 332 transferred issues included in the Facility Review Disposition Project. The primary purposes of the assessment were to ensure project awareness/ownership of the transferred issues and to determine whether any actions had been completed, so they could be officially closed. The assessment revealed that approximately 75 percent (250) of the issues could be closed. The remaining 25 percent were

primarily associated with ongoing CERCLA projects that will remain transferred until the project is completed. In 2004, EWMSD provided SCDHS with documentation justifying the closure of more than 200 of the transferred issues.

#### 3.14.3 Enforcement Actions and Memos

No new consent orders were issued to BNL in 2004. Two Notices of Violation for administrative deficiencies were issued by NYSDEC as a result of the RCRA inspections conducted in January and December (see discussion in Section 3.9). All existing enforcement actions and MOAs are listed in Table 3-9, along with a summary of their status. BNL determined that it has fully complied with the terms and conditions listed in these actions and has submitted supporting documentation to the regulatory agencies. The Laboratory continues to work with the regulators to close these actions as expeditiously as possible.

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