3 Compliance Status

Brookhaven National Laboratory is subject to more than 100 sets of federal, state, and local environmental regulations; numerous site-specific permits; 15 equivalency permits for operation of 12 groundwater remediation systems; and several other binding agreements. In 2005, the Laboratory operated in compliance with most of the requirements defined in these governing documents. Instances of noncompliance were reported to regulatory agencies and corrected expeditiously. 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.

Emissions of nitrogen oxides, carbon monoxide, and sulfur dioxide were all within permit limits. Numerous opacity excursions due to routine soot blowing occurred in the first three quarters of 2005. Efforts to eliminate these excursions were successful in the fourth quarter. Approximately 873 pounds of ozone-depleting refrigerants were recovered for recycling on site or made available for use by other DOE facilities or other federal agencies. In addition, one hundred twenty-five 17-pound Halon 1211 extinguishers were removed from service and will be made available to other DOE facilities. Monitoring of the Laboratory's potable water system showed that it met all drinking water requirements. During 2005, most of the liquid effluents discharged to surface water and groundwater met applicable New York State Pollutant Discharge Elimination System permit requirements. Ten minor excursions of these permit limits were reported for the year, eight at the Sewage Treatment Plant and two at recharge basins. The permit excursions were reported to the New York State Department of Environmental Conservation and the Suffolk County Department of Health Services. Groundwater monitoring at the Major Petroleum Facility continued to demonstrate that current oil storage and transfer operations are not affecting groundwater quality.

Fourteen reportable spills of petroleum products, antifreeze, or chemicals occurred on site in 2005. There were eight petroleum releases less than 5 gallons, one small-volume antifreeze spill, one 20-gallon release of No. 6 fuel oil from a delivery vehicle, two small-volume chemical releases, one outdoor release of a custodial chemical, and one finding of excrement in buckets along a road adjacent to the Laboratory boundary. All releases were cleaned up or addressed to the satisfaction of the New York State Department of Environmental Conservation.

The Laboratory underwent 11 environmental audits by external regulatory agencies in 2005. These audits included inspections of petroleum and chemical storage, air emissions from the Central Steam Facility, 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, and no formal violations or enforcement actions were issued.

3.1 COMPLIANCE WITH REQUIREMENTS

The federal, state, and local environmental statutes and regulations that BNL operates under are summarized in Table 3-1, along with a discussion of the Laboratory's compliance status with regard to each requirement. A list 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 New York State Department of Environmental Conservation (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 39 facilities
- Three 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
- Fifteen equivalency permits for the operation of 12 groundwater remediation

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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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 10 excursions, these discharges met the SPDES permit limits in 2005.	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. There were no inspections in 2005.	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 2005, three 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 *Natural Resource Management Plan* 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, 2003, and 2005. 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

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

3.2.2.1 SPDES Permits

The State Pollutant Discharge Elimination System permit authorizes discharges from the BNL Sewage Treatment Plant (STP) to the Peconic River, and discharges of cooling water and stormwater to recharge basins. A permit renewal was filed with NYSDEC in August 2004 and the renewal was approved in May 2005. The expiration date for the renewed permit is March 1, 2010. Most of the permit requirements are identical to those issued in February 2004. Chronic Toxicity Testing of the STP effluent at Outfall 001 (Figure 5-6) was also renewed in the permit.

Discharges of treated groundwater under the CERCLA program are also overseen by NYSDEC through the issuance of "SPDES equivalency" permits. The SPDES permits and equivalency permits that authorize the operation of the groundwater remediation systems are discussed in SER Volume II, Groundwater Status Report.

3.2.2.2 Air Emissions Permits

Air emissions permits are granted by NYSDEC. Permits are issued as "equivalency" permits for the installation and operation of groundwater remediation systems under CERCLA, or as changes to the BNL Title V operating permit. During 2005, no CERCLA air-equivalency permits were issued and no changes were made to the Laboratory's 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. The Laboratory 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 Permit

Under the Safe Drinking Water Act (SDWA), BNL is required to maintain an Area Permit for

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	1-Aug-09	NA	NA
NYSDEC - SPDES Equivalency	855	Sr-90 Treatment System-BGRR/WCF	None	1-Jan-10	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	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
EPA = Environmental Protection Agency
LIPA = Long Island Power Authority
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

underground injection control wells (e.g., drywells, cesspools, and leaching pools). The Laboratory received a final permit in January 2001, authorizing the operation of 90 UICs, including 86 stormwater drywells and four small sanitary systems. The only change to the UIC inventory in 2005 was the completed closure of a sanitary wastewater disposal system at Building 445, part of the former Hazardous Waste Management Facility.

UICs also are used to recharge treated groundwater. The Laboratory has 34 of these UICs, which are authorized by rule rather than permit. In 2005, BNL's inventory, on record with EPA, was unchanged.

3.2.2.4 RCRA Permit

In January of 2005, the Laboratory submitted to NYSDEC a RCRA permit renewal application for hazardous waste storage at the Waste

Management Facility. In accordance with regulations, the application was submitted at least 180 days before the existing permit expired. Until NYSDEC completes its review of the application, BNL continues to operate under the conditions of the existing permit, as allowed by the State Administrative Procedure Act.

3.3 NEPA ASSESSMENTS

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 2005, environmental evaluations were completed for 186 proposed projects. Of these, 177 were considered minor actions requiring no additional documentation. The remaining nine projects were addressed by submitting notification forms to DOE, which determined that they were covered by existing Categorical Exclusions as per 10 CFR 1021 or fell within the scope of a previous environmental assessment. No new environmental assessments were required.

3.4 PRESERVATION LEGISLATION

The Laboratory is subject to several cultural resource laws, most notably the National Historic Preservation Act and the Archeological Resource Protection Act. These acts require agencies to consider the effects of proposed federal actions on historic structures, objects, and documents, as well as cultural or natural places important to Native Americans or other ethnic groups.

BNL has three structures or sites that are eligible for listing on the National Register of Historic Places: the Brookhaven Graphite Research Reactor complex, the High Flux Beam Reactor complex, and the World War I Army training trenches associated with Camp Upton. In 2005, the Cultural Resource Management Plan for BNL was approved by DOE and submitted to the New York State Historic Preservation Officer.

The annual Department of Interior questionnaire regarding historic and cultural resources was completed and submitted in March 2005. Additional activities associated with legislated compliance are described in Chapter 6.

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

3.5.1 Conventional Air Pollutants

The Laboratory 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 requirements. Three of the boilers can burn either residual fuel oil or natural gas; Boiler 1A burns fuel oil only. In 2005, low nitrogen residual fuel oil (i.e., 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), the requirements establish emissions standards for oxides of nitrogen (NO_x). 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_x emission standards when burning residual fuel oil with low nitrogen content. To ensure continued compliance, an outside contract analytical laboratory analyzes composite samples (collected quarterly) of fuel deliveries. The analyses conducted in 2005 confirmed that the fuel-bound nitrogen content met these require-

ments. Compliance with the 0.30 lbs/MMBtu NO_x emission standards for Boilers 6 and 7 was demonstrated by continuous emission monitoring of the flue gas. In 2005, NO_x emissions from Boilers 6 and 7 averaged 0.245 lbs/MMBtu and 0.180 lbs/MMBtu, respectively, and there were no known exceedances of the NO_x emission standard for either boiler.

The Laboratory also maintains continuous opacity monitors for Boilers 6 and 7. These monitors measure the transmittance of light through the exhaust gas and report this measurement in percent attenuated. Opacity limitations state that no facility may emit particulates such that the opacity exceeds 20 percent, calculated in 6-minute averages, except for one period not to exceed 27 percent in any one hour. To maintain boiler efficiency, soot that accumulates on the boiler tubes must be removed. This is accomplished by passing a mixture of high-pressure steam and air through the boiler using a series of blowers. In 2005, BNL reported 107 periods where opacity exceeded the 6-minute, 20 percent average due to soot blowing operations. In past years, soot blowing was considered by BNL to be a required maintenance activity and, as such, was understood to be allowed. However, a 2005 review of these operations by NYSDEC determined that each excursion was a deviation from the opacity limitation. The Laboratory approached the issue aggressively and by August had developed a procedure to prevent these excursions by resequencing the soot blowing cycle. From October to December 2005, the automatic monitoring equipment reported no opacity excursions due to soot blowing. During the year, other deviations from the opacity standard occurred during boiler startup and shutdown. Both EPA and NYSDEC recognize these periods as permissible.

3.5.1.2 Ozone-Depleting Substances

Refrigerants. The Laboratory's preventative maintenance program requires regular inspection and maintenance of refrigeration and air conditioning equipment that contains ozone-depleting substances such as R-11, R-12, and R-22. All refrigerant recovery and recycling equipment 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 2005, approximately 400 pounds of R-11, 238 pounds of R-113, and 235 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, the Laboratory 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 technicians use halon recovery and recycling devices, to comply with the CAA provisions.

In 2005, BNL declared one hundred twenty-five 17-pound Halon 1211 portable fire extinguishers as excess property. The Laboratory is making arrangements for their transfer to another DOE facility or to another federal agency, in accordance with the Class I Ozone Depleting Substances Disposition Guidelines of the DOE Office of Environmental Policy and Guidance. The portable extinguishers became excess property after they were removed from areas they served, due to changes in operations, or when they were replaced with ABC dry-chemical or with clean agent FE-36 extinguishers.

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 National Emission Standards for Hazardous Air Pollutants (NESHAPs) program was established in 1977 and the governing regulations were updated significantly in 1990. EPA developed this program to limit the emission of 189 toxic air pollutants. This program includes 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

No proposed or promulgated Maximum Available Control Technology (MACT) standards apply to BNL operations, according to the Laboratory's review of existing state and federal CAA regulations during preparation of the Title V Phase II application. Additional evaluations conducted in 2005 determined that no MACT standards apply to the anticipated emissions from proposed activities or operations.

3.5.2.2 Asbestos

In 2005, the Laboratory notified the EPA Region II office regarding removal of materials containing asbestos. During the year, 1,015 linear ft of asbestos-containing pipe insulation, 8,355 ft^2 of asbestos-containing surface material (siding, roofing, and vinyl asbestos floor tile removed during demolition or renovation), and 160 yd^3 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 at or near BNL. A full description of the monitoring conducted by BNL in 2005 is provided in Chapter 4. The Laboratory transmitted all data pertaining to radioactive air emissions and dose calculations to EPA in fulfillment of the June 30 annual reporting requirement. As in past years, in 2005 the maximum off-site dose due to airborne radioactive emissions from the Laboratory continued to be far below the 10 mrem (100 μSv) 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 resulting from airborne emissions, calculated using EPA's modeling software, was 0.053 mrem (0.53 μSv).

3.6 CLEAN WATER ACT

The disposal of wastewater generated by Laboratory 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 the Laboratory and renewed that permit in May 2005. This permit provides monitoring requirements and specifies effluent limits for nine of 12 outfalls, as described below. See Figure 5-7 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 (e.g., drywells) that receive predominantly sanitary waste and steam- and air-compressor condensate discharges. NYSDEC does not require monitoring of this outfall.

Each month, the Laboratory prepares Discharge Monitoring Reports that describe monitoring results, 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. Details of the moni-

toring program conducted for the groundwater treatment systems and SPDES equivalency permit performance are provided in SER Volume II, 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 are also shown. The Laboratory monitors the STP discharge for more than 100 parameters monthly and more than 200 parameters quarterly. BNL's overall compliance with effluent limits was greater than 99 percent. In 2005, there were eight excursions of the SPDES permit limits: two each for total nitrogen and ammonia, and one each for iron, zinc, methylene chloride, and copper. Each of these excursions was investigated, as follows.

The Laboratory's SPDES limits were exceeded in February for ammonia and in February and March for total nitrogen. In March, copper was found in the effluent at a concentration of 0.16 mg/L, exceeding the permit limit of 0.15 mg/L. Investigation revealed that an out-of-service bypass valve had separated from the concrete wall of the primary clarifier effluent chamber, allowing untreated waste to bypass secondary treatment. The valve was removed and the penetration was sealed with concrete.

Methylene chloride was detected in the STP discharge in one of the two August samples.

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

Analyte	Low Report	High Report	Min. Monitoring. Freq.	SPDES Limit	Exceedances	% Compliance*
Max. temperature (°F)	50	88	Daily	90	0	100
pH (SU)	6.2	7.8	Continuous Recorder	Min. 5.8	0	100
Avg. 5-day BOD (mg/L)	< 1	2.5	Twice Monthly	10	0	100
Max. 5-day BOD (mg/L)	< 2	4	Twice Monthly	20	0	100
% BOD removal	> 95	> 98	Monthly	85	0	100
Avg. TSS (mg/L)	< 0.3	< 1.7	Twice Monthly	10	0	100
Max. TSS (mg/L)	< 0.6	< 5.7	Twice Monthly	20	0	100
% TSS removal	> 95	> 99	Monthly	85	0	100
Settleable solids (ml/L)	0.0	0.0	Daily	0.1	0	100
Ammonia nitrogen (mg/L)	< 0.10	3.68 (a)	Twice Monthly	2	2	94
Total nitrogen (mg/L)	2.0	13.1 (b)	Twice Monthly	10	2	94
Total phosphorus (mg/L)	1.1	1.7	Twice Monthly	NA	0	100
Cyanide (mg/L)	< 2.5	< 5.0	Twice Monthly	100	0	100
Copper (mg/L)	0.017	0.16 (c)	Twice Monthly	0.15	1	97
Iron (mg/L)	0.06	0.41 (d)	Twice Monthly	0.37	1	97
Lead (mg/L)	< 0.001	0.005	Twice Monthly	0.019	0	100
Nickel (mg/L)	0.005	0.026	Twice Monthly	0.11	0	100
Silver (mg/L)	0.001	0.003	Twice Monthly	0.015	0	100
Zinc (mg/L)	0.019	0.15 (e)	Twice Monthly	0.1	1	97
Mercury (mg/L)	< 0.00005	0.0005	Twice Monthly	0.0008	0	100

(continued on next page)

Table 3-3. Analytical Results for Wastewater Discharges to Sewage Treatment Plant Outfall 001*(concluded).*

Analyte	Low Report	High Report	Min. Monitoring. Freq.	SPDES Limit	Exceedances	% Compliance*
Toluene (mg/L)	< 1.0	< 1.0	Twice Monthly	5	0	100
Methylene chloride (mg/L)	< 1.0	9.2 (f)	Twice Monthly	5	1	97
1,1,1-trichloroethane (µg/L)	< 1.0	< 1.0	Twice Monthly	5	0	100
2-butanone (µg/L)	< 2.0	< 5.0	Twice Monthly	50	0	100
PCBs (µg/L)	< 0.065	< 1.0	Quarterly	NA	0	100
Max. flow (MGD)	0.33	0.83	Continuous Recorder	2.3	0	100
Avg. flow (MGD)	0.24	0.57	Continuous Recorder	NA	0	100
Avg. fecal coliform (MPN/100 mL)	< 1	< 1	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, one collected in February and one in December, had concentrations of ammonia that exceeded permit limits.
(b) Two permit exceedances of the total nitrogen limits were reported, one in February and one in March.
(c) A single sample collected in March exhibited a copper concentration of 0.16 ppm, which exceeded the permit limit of 0.15 ppm.
(d) A single sample of iron collected in December exhibited a concentration of 0.41 ppm, which exceeded the permit limit of 0.37 ppm.
(e) A single sample of zinc collected in December exceeded the permit limit of 0.1 ppm, with a concentration of 0.15 ppm.
(f) A single sample of methylene chloride collected in August exhibited a concentration of 9.2 ppb, which exceeded the permit limit of 5.0 ppb

Please refer to Section 3.6.1 for an explanation of these permit exceedances.

No direct cause could be found; the detection may have been the result of error at the contract analytical laboratory. Methylene chloride is frequently detected in wastewater samples at concentrations up to 10 ppb, but in many cases the results are accompanied by notations indicating that methylene chloride was also detected in the analytical laboratory's control samples, or that the detection is estimated.

In December, deviations were recorded for zinc, ammonia, and iron. This release was the result of decanting more than typical volumes of water from the aerobic digesters. Although water is routinely released from the digesters back to the head of the treatment plant, the volume released in December was approximately 25 percent higher than usual. Testing of the digester showed the water to contain very high levels of iron and zinc. 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

The Laboratory's SPDES permit requires that "whole effluent toxicity" (WET) tests be conducted to ensure that chemicals present in the STP effluent are not toxic to aquatic organisms. BNL's chronic toxicity testing program began in 1993 and continued through 2003. Toxicity testing was postponed in 2004, but was restarted in March 2005 as stipulated in the 2005 SPDES permit renewal. 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. In each test, 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. During testing, the growth rate of the fish and/or rate of reproduction for the water flea is measured and compared to untreated organisms (i.e., controls). The test results are submitted to NYSDEC for review.

In 2005, toxicity tests were conducted in March, April, June, September, and December. During the test conducted in March, there was no toxicity exhibited in the minnow, but a high mortality in the water fleas, due to the

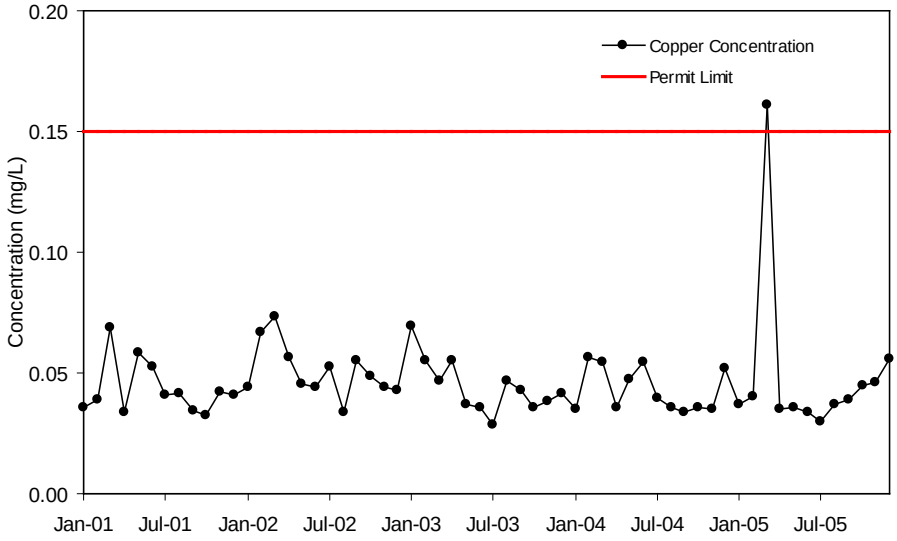

Figure 3-1. Maximum Concentrations of Copper Discharged from the BNL Sewage Treatment Plant, 2001–2005.

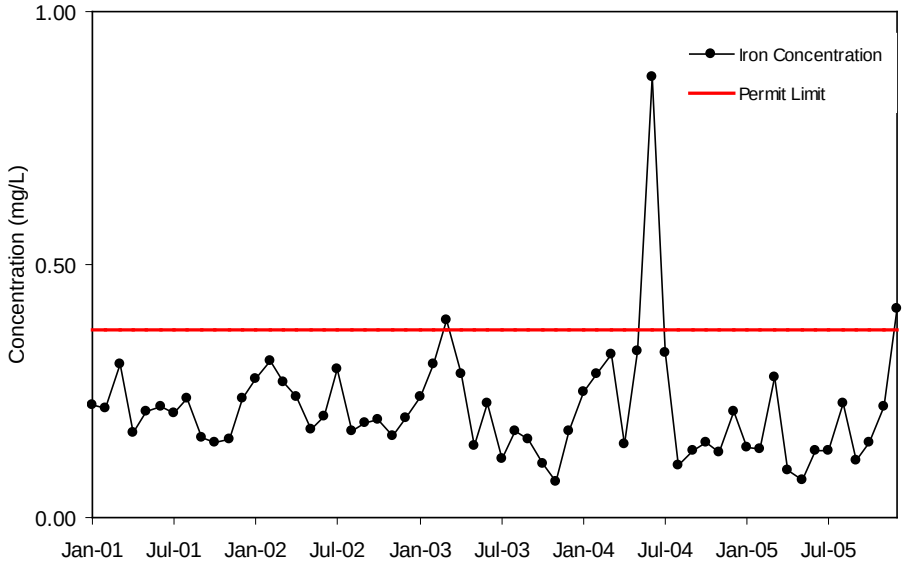

Figure 3-2. Maximum Concentrations of Iron Discharged from the BNL Sewage Treatment Plant, 2001–2005.

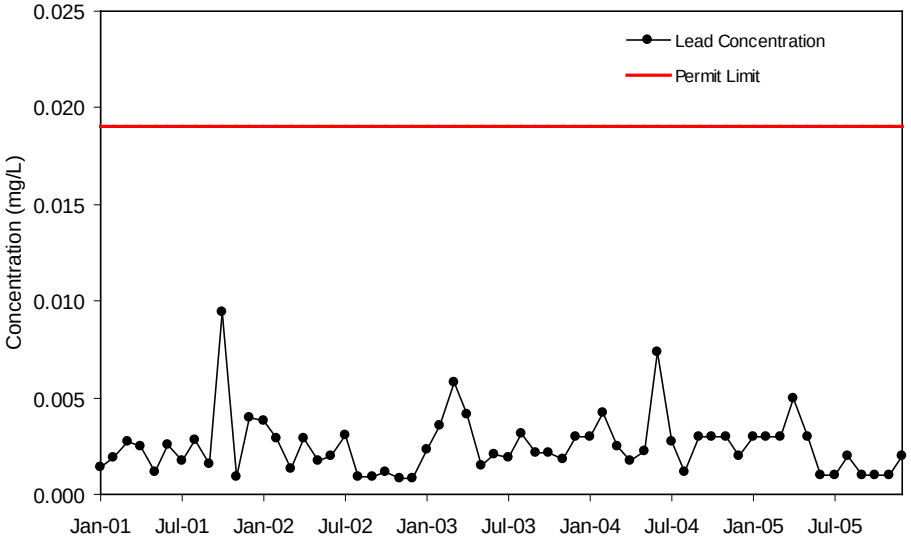

Figure 3-3. Maximum Concentrations of Lead Discharged from the BNL Sewage Treatment Plant, 2001–2005.

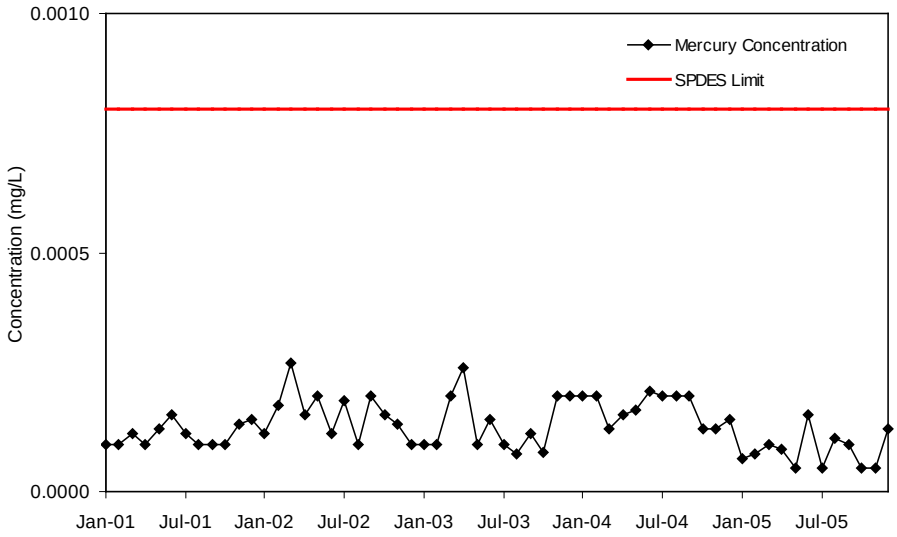

Figure 3-4. Maximum Concentrations of Mercury Discharged from the BNL Sewage Treatment Plant, 2001–2005.

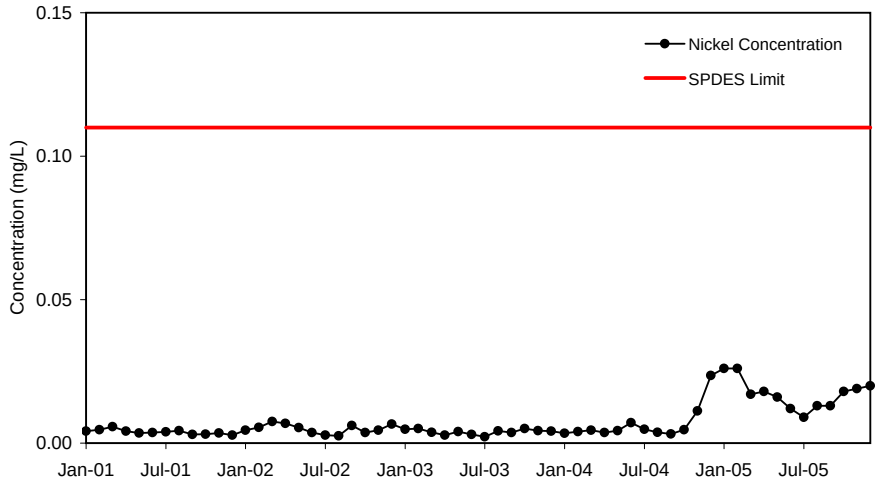

Figure 3-5. Maximum Concentrations of Nickel Discharged from the BNL Sewage Treatment Plant, 2001–2005.

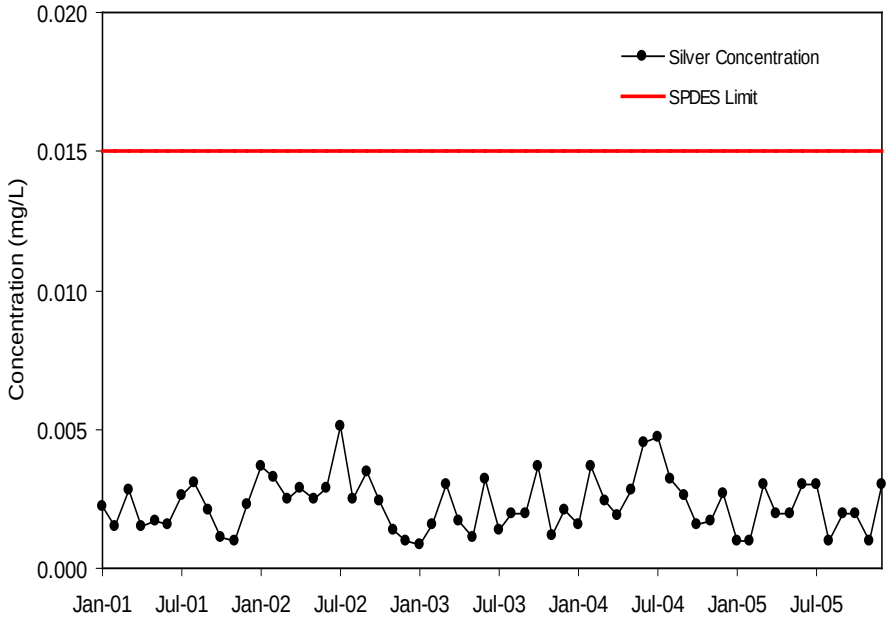

Figure 3-6. Maximum Concentrations of Silver Discharged from the BNL Sewage Treatment Plant, 2001–2005.

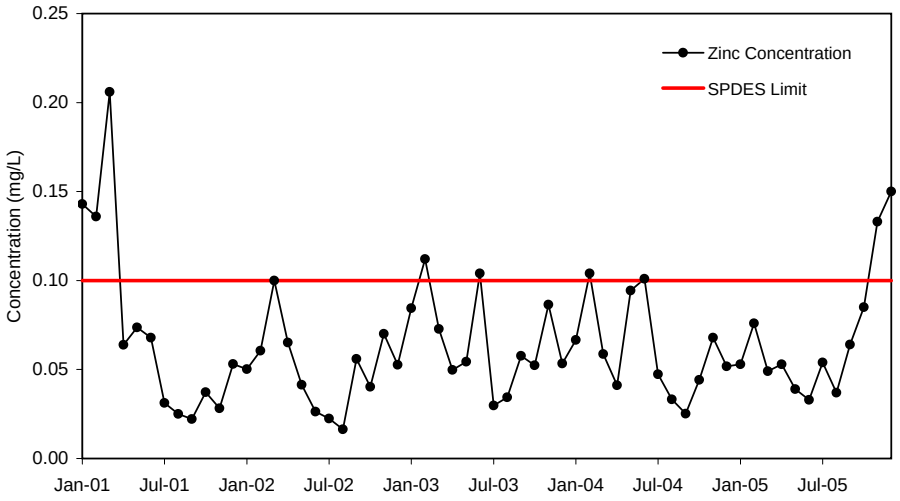

Figure 3-7. Maximum Concentrations of Zinc Discharged from the BNL Sewage Treatment Plant, 2001–2005.

Note: Per NYSDEC guidance, the concentration of zinc exhibited in the effluent during February and June of 2003 and 2004 was not considered in violation of the SPDES effluent limit of 0.1 mg/L, due to rounding off of significant figures.

elevated copper levels discussed above. Review of the results of tests conducted in April, June, and September showed minor impacts on the water flea reproduction rates. Tests conducted in December showed no impact. In December, water used in the test as a dilution and control source was collected from the Water Treatment Plant (WTP) rather than from Well 12, which had been used in the four earlier tests. Water from the WTP is treated with lime to remove iron and is aerated to remove volatile organic compounds (VOCs), whereas water from Well 12 is naturally low in iron and is only treated by pH adjustment and carbon filtration. It is possible that water from Well 12 may be too void of ions for optimal water flea health, in which case the test organisms may not have been healthy at the onset of the test. The addition of lime at the WTP may provide enough calcium to overcome the effects of low ion content. Testing will continue in 2006 using water from the WTP to evaluate this theory. Minnows exhibited no acute or chronic toxicity in all tests conducted in 2005.

3.6.2 Recharge Basins and Stormwater

Water discharged to Outfalls 002 through 008 and Outfalls 010 through 012 recharges 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 2005. Two deviations were recorded at Outfall 006. The concentration of oil and grease (16.1 mg/L) in February slightly exceeded the permit limit of 15 mg/L. This was attributed to a low volume of snow melt run-off from parking lots. The second was a deviation of the pH limit of 9.0 SU at Basin 006A. The cause of this excursion was tracked to high pH in the potable water serving Building 930. The pH of water measured at the bathroom tap was 9.5 SU. The direct cause for the elevated pH was an overdose of sodium hydroxide to the potable water system. The system was flushed and the pH returned to typical levels of 7 – 8 SU.

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 the Suffolk County Department of Health Services (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

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	CR	11	10			
	Min.	0.04	0.001	0.01	0.04	0.01	0.10	0.001	0.000	NA		
	Max.	0.36	0.14	0.75	0.65	0.38	0.44	1.1	0.3	NA	NA	NA
pH (SU)	Min.	6.3	7.1	6.6	6.4	6.5	6.6	6.7	6.4	NA		
	Max.	8.3	8.9	9.4	9.4	8.8	7.8	8.4	8.0	8.5, 9.0 (a)	1	98
Oil and grease (mg/L)	N	12	10	12	12	12	NR	11	10			
	Min.	< 0.94	< 1.0	0.95	< 0.94	< 0.97	NR	< 0.93	< 0.9	NA		
	Max.	6.4	8.5	7.4	6.3	16.1	NR	6.5	6	15	1	92
Copper (mg/L)	N	NR	NR	4	NR	NR	NR	NR	4			
	Min.	NR	NR	< 0.003	NR	NR	NR	NR	< 0.003	NA		
	Max.	NR	NR	0.01	NR	NR	NR	NR	0.01	1.0	0	100
Aluminum (mg/L)	N	4	NR	NR	NR	NR	NR	4	4			
	Min.	< 0.07	NR	NR	NR	NR	NR	< 0.07	< 0.07	NA		
	Max	0.4	NR	NR	NR	NR	NR	0.2	0.1	2.0	0	100
Lead (mg/L)	N	NR	NR	NR	NR	NR	NR	NR	4			
	Min.	NR	NR	NR	NR	NR	NR	NR	< 0.0005	NA		
	Max	NR	NR	NR	NR	NR	NR	NR	0.001	0.05	0	100
Vanadium (mg/L)	N	NR	NR	NR	NR	NR	NR	NR	4			
	Min.	NR	NR	NR	NR	NR	NR	NR	0.004	NA		
	Max	NR	NR	NR	NR	NR	NR	NR	0.019	NPL	NA	NA
Chloroform (µg/L)	N	4	NR	NR	NR	NR	NR	NR	NR			
	Min.	0.1	NR	NR	NR	NR	NR	NR	NR	NA	NA	
	Max.	0.5	NR	NR	NR	NR	NR	NR	NR	7	0	100
Bromo-dichloromethane (µg/L)	N	4	NR	NR	NR	NR	NR	NR	NR			
	Min.	< 1.0	NR	NR	NR	NR	NR	NR	NR	NA	NA	
	Max.	0.26	NR	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	NR	11	NR			
	Min.	< 0.5	NR	NR	NR	NR	NR	< 0.5	NR	NA	NA	
	Max.	< 1.0	NR	NR	NR	NR	NR	< 5.0	NR	5	0	100
1,1-dicloroethylene (µg/L)	N	NR	NR	NR	NR	NR	NR	11	NR			
	Min.	NR	NR	NR	NR	NR	NR	< 0.5	NR	NA	NA	
	Max.	NR	NR	NR	NR	NR	NR	< 5.0	NR	5	0	100
Hydroxyethylidene-diphosphonic acid (mg/L)	N	4	3	4	4	4	NR	NR	NR			
	Min.	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	NR	NR	NR	NA	NA	
	Max.	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	NR	NR	NR	0.5	0	100
Tolyltriazole (mg/L)	N	4	3	4	4	4	NR	NR	NR			
	Min.	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	NR	NR	NR	NA	NA	
	Max.	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	NR	NR	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.

2005) is prepared to comply with these requirements.

3.7.1 Potable Water

The Laboratory 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 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. The Laboratory also voluntarily monitors drinking water supplies for radiological contaminants. Tables 3-5 and 3-6 provide the potable water supply monitoring data for 2005. Color and iron exceeded DWS in samples collected from two of the wells (wells 6 and 7) before distribution. Treatment at the Water Treatment Plant effectively reduced these levels to below DWS. At the point of consumption, drinking water complied with all DWS during 2005. 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, sec-

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

Compound	Well No. 6	Well No. 7	Well No. 10	Well No. 11	Well No. 12	Potable Distribution Sample	NYS DWS
Water Quality Indicators							
Total coliform	ND	ND	ND	ND	ND	ND	Negative
Color (units)	30*	10	< 5	< 5	< 5	30	15
Odor (units)	0	0	0	0	0	0	3
Cyanide (µg/L)	< 10	< 10	< 10	< 10	< 10	< 10	SNS
Conductivity (µmhos/cm)	129	139	111	307	247	189	SNS
Chlorides (mg/L)	22.4	25.5	14.4	20.5	22.8	28.7	250
Sulfates (mg/L)	7.1	11.2	6.9	8.8	7.6	11.2	250
Nitrates (mg/L)	0.22	0.28	0.3	0.58	0.52	0.31	10
Nitrites (mg/L)	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	1.0
Ammonia (mg/L)	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	SNS
pH (Standard Units)	6.1	6.1	6.3	6.0	6.0	6.9	SNS
MBAS (mg/L)	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	SNS
Metals							
Antimony (µg/L)	< 5.90	< 5.90	< 5.90	< 5.90	< 5.90	< 5.90	6.0
Arsenic (µg/L)	< 3.00	< 3.00	< 3.00	< 3.00	< 3.00	< 3.00	50
Barium (mg/L)	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	2.0
Beryllium (µg/L)	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	4.0
Cadmium (µg/L)	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	5.0
Chromium (mg/L)	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	0.1
Fluoride (mg/L)	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	2.2
Iron (mg/L)	2.69*	2.15*	< 0.02	< 0.02	< 0.02	0.856	0.3
Lead (µg/L)	< 1.0	< 1.0	< 1.0	< 1.0	1.9	< 1.0	15
Manganese (mg/L)	0.079	0.0741	< 0.010	< 0.010	< 0.010	0.031	0.3
Mercury (µg/L)	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	2.0
Nickel (mg/L)	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	SNS
Selenium (µg/L)	< 5.00	< 5.00	< 5.00	< 5.00	< 5.00	< 5.00	50.0
Sodium (mg/L)	12.4	14.0	8.54	13.6	12.5	17.0	SNS
Silver (µg/L)	< 10	< 10	< 10	< 10	< 10	< 10	100
Thallium (µg/L)	< 1.90	< 1.90	< 1.90	< 1.90	< 1.90	< 1.90	2.0
Zinc (mg/L)	0.037	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	5.0
Radioactivity							
Gross alpha activity (pCi/L)	< 1.6	< 1.2	< 1.1	< 1.2	< 1.4	NR	15.0
Gross beta activity (pCi/L)	< 1.9	< 1.9	< 1.9	< 1.8	< 1.81	NR	(a)
Tritium (pCi/L)	< 394	< 378	< 300	< 393	<352	NR	20,000
Strontium-90 (pCi/L)	< 0.59	< 0.67	< 0.56	< 0.65	< 0.61	NR	8.0

(continued on next page)

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

Compound	Well No. 6	Well No. 7	Well No. 10	Well No. 11	Well No. 12	Potable Distribution Sample	NYS DWS
Other							
Asbestos (M. fibers/L)	NR	NR	NR	NR	NR	< 0.13	7
Calcium (mg/L)	4.1	5.99	5.96	6.27	8.19	11	SNS
Alkalinity (mg/L)	12.4	24	31.3	16.4	21.7	28.9	SNS
Residual chlorine - MRDL (mg/L)	NR	NR	NR	NR	NR	0.7	4.0
TTHM (mg/L)	NR	NR	NR	NR	NR	<0.005	0.08**
HAA5 (mg/L)	NR	NR	NR	NR	NR	<0.002	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

ondary 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.

The Laboratory 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. If a problem is encountered during testing, the device is repaired and retested to ensure proper function. Approximately 160 cross-connection control units were tested at BNL in 2005, including primary and secondary devices; no cross-contamination problems were found.

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 protecting underground sources of drinking water. In New York State, the UIC program is implemented through EPA, because 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. In 2005, The Laboratory completed the closure of a UIC device formerly serving Building 445.

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 PREVENTING AND REPORTING SPILLS

Several federal, state, and local regulations address the management of storage facilities containing chemicals, petroleum, and other hazardous materials. The regulations include specifications for the design of storage facilities, requirements for written plans relating to unplanned releases, and requirements for reporting any releases that do occur. The following subsections describe BNL's compliance with these regulations.

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

Compound	WTP **Effluent**	Well No. 6	Well No. 7	Well No. 10	Well No. 11	Well No. 12	NYS DWS
	μg/L						
Dichlorodifluoromethane	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
Chloromethane	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
Vinyl Chloride	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	2
Bromomethane	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
Chloroethane	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
Trichlorofluoromethane	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
1,1-dichloroethene	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
Methylene Chloride	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
trans-1,2-dichloroethene	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
1,1-dichloroethane	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
cis-1,2-dichloroethene	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
2,2-dichloropropane	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
Bromochloromethane	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
1,1,1-trichloroethane	< MDL	< MDL	< MDL	< MDL	< MDL	0.5	5
Carbon Tetrachloride	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
1,1-dichloropropene	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
1,2-dichloroethane	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
Trichloroethene	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
1,2-dichloropropane	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
Dibromomethane	< MDL	< MDL	<MDL	< MDL	< MDL	< MDL	5
trans-1,3-dichloropropene	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
cis-1,3-dichloropropene	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
1,1,2-trichloroethane	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
1,3-dichloropropane	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
Chlorobenzene	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
1,1,1,2-tetrachloroethane	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
Bromobenzene	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
1,2,3-trichloropropane	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
2-chlorotoluene	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
4-chlorotoluene	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
1,3-dichlorobenzene	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
1,4-dichlorobenzene	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
1,2-dichlorobenzene	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
1,2,4-trichlorobenzene	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
Hexachlorobutadiene	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
Tetrachloroethene	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
1,1,2,2-Tetrachloroethane	< 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 *(continued).*

Compound	WTP **Effluent**	Well No. 6	Well No. 7	Well No. 10	Well No. 11	Well No. 12	NYS DWS
				µg/L			
1,2,3-trichlorobenzene	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
Benzene	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
Toluene	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
Ethylbenzene	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
m,p-xylene	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
o-xylene	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
Styrene	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
Isopropylbenzene	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
n-propylbenzene	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
1,3,5-trimethylbenzene	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
tert-butylbenzene	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
1,2,4-trimethylbenzene	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
sec-butylbenzene	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
4-Isopropyltoluene	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
n-butylbenzene	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
Chloroform	1.2	2.1	0.8	0.5	0.6	< MDL	50
Bromodichloromethane	2	< MDL	< MDL	< MDL	< MDL	< MDL	50
Dibromochloromethane	1.4	< MDL	< MDL	< MDL	< MDL	< MDL	50
Bromoform	< MDL	< MDL	< MDL	0.6	< MDL	< MDL	50
Methyl tert-butyl ether	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	50
Lindane	NR	< MDL	< MDL	< MDL	< MDL	< MDL	0.2
Heptachlor	NR	< MDL	< MDL	< MDL	< MDL	< MDL	0.4
Aldrin	NR	< MDL	< MDL	< MDL	< MDL	< MDL	5
Heptachlor Epoxide	NR	< MDL	< MDL	< MDL	< MDL	< MDL	0.2
Dieldrin	NR	< MDL	< MDL	< MDL	< MDL	< MDL	5
Endrin	NR	< MDL	< MDL	< MDL	< MDL	< MDL	0.2
Methoxychlor	NR	< MDL	< MDL	< MDL	< MDL	< MDL	40
Toxaphene	NR	< MDL	< MDL	< MDL	< MDL	< MDL	3
Chlordane	NR	< MDL	< MDL	< MDL	< MDL	< MDL	2
Total PCB's	NR	< MDL	< MDL	< MDL	< MDL	< MDL	0.5
2,4,5,-TP (Silvex)	NR	< MDL	< MDL	< MDL	< MDL	< MDL	10
Dinoseb	NR	< MDL	< MDL	< MDL	< MDL	< MDL	50
Dalapon	NR	< MDL	< MDL	< MDL	< MDL	< MDL	50
Picloram	NR	< MDL	< MDL	< MDL	< MDL	< MDL	50
Dicamba	NR	< MDL	< MDL	< MDL	< MDL	< MDL	50
Pentachlorophenol	NR	< MDL	< MDL	< MDL	< MDL	< MDL	1
Hexachlorocyclopentadiene	NR	< 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 *(concluded).*

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

Notes:
See Chapter 7, Figure 7-3 for well locations.
Well 4 not used in 2005.
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 contract analytical 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.

< 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

3.8.1 Preventing Oil Pollution and Spills

The Laboratory must maintain a Spill Prevention Control and Countermeasures (SPCC) Plan as a condition of its license to store petroleum fuel 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 (Chaloupka 2000). The Laboratory remained in full compliance with the SPCC requirements in 2005.

In July 2002, EPA adopted significant changes to the SPCC regulations that 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 < 55 gallons need not be counted toward reaching SPCC applicability. The timeline for updating and implementing BNL's SPCC plan to incorporate these changes has been extended until October 2007, although the Laboratory is proceeding with changes to the plan and expects the changes to be completed before that date.

BNL also maintains a Facility Response Plan (FRP) (Lee 2002) that outlines emergency response procedures to be implemented in the event of a worst-case discharge of oil. The Laboratory received notification from EPA in October that the FRP was deficient in several areas, mostly for missing or inadequate information. The plan was revised accordingly and will be resubmitted in early February 2006.

3.8.2 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 (i.e., Tier II Report) and releases (i.e., Tier III Report) of certain chemicals that exceed specific thresholds. These reports are submitted 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. The Laboratory complied with these requirements in 2005 through the submittal of reports under EPCRA Sections 302, 303, 311, and 312. In 2005, through the Tier III report, BNL reported releases of lead (~ 2,355 pounds), mercury (~ 140 pounds), PCBs (~ 3,200 pounds), benzo(g,h,i) perylene (< 1 pound), and polycyclic aromatic compounds (< 1 pound). Releases of lead, PCBs, and mercurywere predominantly in the form of shipments of waste for off-site recycling or disposal. Releases of benzo(g,h,i)perylene and polycyclic aromatic compounds were as byproducts of combustion of fuel oils. In 2005, there were no releases of "extremely hazardous substances" that were reportable under Part 304.

3.8.3 Spills and Releases

When a spill of hazardous material occurs, Laboratory 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 must be reported to both NYSDEC and SCDHS, and any release impacting surface water must also be reported to the EPA National Response Center. In addition, a release of more than 5 gallons of petroleum product to impermeable surfaces or containment areas must be reported to NYSDEC and SCDHS. Spills of chemicals in quantities greater than the CERCLA-reportable limits must be reported to the EPA National Response Center, NYSDEC, and SCDHS. Remediation of the spill is con-

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 [ ]

ducted as necessary to restore the site.

During 2005, there were 34 spills, of which 14 met external agency reporting criteria. The remaining 20 spills were small-volume releases either to containment areas or to other impermeable surfaces that did not exceed a reportable quantity. Eight of the 14 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. There was one spill of antifreeze from a piece of machinery, one 20-gallon release of No. 6 fuel oil from a delivery vehicle, two small-volume chemical releases, one outdoor release of a custodial chemical, and one finding of human excrement in buckets along a road adjacent to the BNL boundary. 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).

The Laboratory has been very successful in reducing the number and severity of spills. In 2005, the total incidence of spills was reduced by 55 percent, from 76 spills in 2004 to 34 for 2005. Measures employed to achieve this reduction included: changing petroleum-based lubricants and fluids with vegetable-based products, installing stainless steel-reinforced hydraulic lines on various pieces of grounds equipment and heavy equipment, and training staff in

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

Spill No. and Date	Material and Quantity	ORPS Report	Source/Cause and Corrective Actions
05-01 Jan 26	Solvent Mixture 1 gallon	Yes SC-CH-BH-BNL-BNL-2005-0001	The 490 Building Manager requested that plumbing work be performed in Room 907. For access to the work area, a researcher was asked to move a full, 1-gallon glass bottle of a solvent mixture containing acetone (40%), hexane (38%), methylene chloride (20%), ethyl acetate (1%), ethanol (1%), and porphyrin. The manager placed the container on a cart and during transport the cart hit a bump (possibly a door sill). The container fell to the floor and broke. The incident was reported to the fire and police groups and a cleanup response began. More than 90 percent of the mixture evaporated prior to the response team arrival. The small amount of liquid remaining was removed with absorbent pads. The pads, personal protective equipment, and broken glass container were placed in a plastic bucket and were properly disposed. The spill was reported to regulatory agencies, as > 1 pound of hexane was released to the air.
05-03 Feb 8	Hydraulic Fluid < 1 gallon	No	During repairs to the railroad siding, a hose failed on a backhoe and released hydraulic fluid to the railroad tracks, ballast, and ties. All visually impacted soils and ballast were removed for disposal. Waste was sent to an approved disposal facility.
05-04 Mar 14	Hydraulic Fluid 1 pint	No	While working on the Peconic River cleanup, an Envirocon worker noticed a hydraulic leak from a Bobcat working on the temporary plastic mat road. Approximately 1 pint of hydraulic oil leaked from the plastic mat onto surrounding soil. The spill was immediately contained and cleaned up.
05-08 Mar 31	Human Excrement < 1 gal	No	Numerous 5-gallon plastic buckets in garbage bags were found on BNL property along a road adjacent to the BNL east boundary. The Emergency Services Division HAZMAT Team packaged the waste into DOT-approved containers (three 55-gal drums) and then transferred it to the Waste Management area. The containers were opened on April 7 by a BNL vendor (Onyx) and human excrement was found. The waste was re-packaged and disposed of as Regulated Medical Waste through the Medical Department.
05-10 April 12	Compressor Oil 2 ounces	No	A dewatering pump on the Peconic River remediation project blew compressor oil out of the discharge hose, to the plastic containment below and adjacent soil. The discharge was apparently due to failure of the compressor rings. The oil released to the containment pad and the affected soil was removed for proper disposal.
05-13 May 18	Diesel Fuel ½ gallon	No	Oil-stained grass was discovered in an area where a portable emergency generator had been parked, behind Bldg. 610. The stained area was approximately 2 ft in diameter. Diesel fuel is believed to have leaked from the fill cap of the generator fuel storage tank as a result of thermal expansion of the fuel. Buildings and Grounds personnel removed all visibly contaminated grass and underlying soil for off-site disposal.

(continued on next page)

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
05-17 Jun 20	Slaked Lime 15 pounds	No	BNL personnel discovered a white-chalky, alkaline solid material on soil along a concrete headwall near an on-site drinking water wellhouse and reported it to the Emergency Services Division as an unknown material spill. The material was collected and put in a plastic 15-gallon waste container. During the clean-up, samples were collected for chemical identification/ fingerprinting. Samples of similar material on site, including Quick Lime and ice melt, were compared with the unknown substance using field fingerprinting methods: reaction with acids, precipitation of solids, and pH. Based on these tests (high pH and calcium content), the unknown material was identified as slaked lime (calcium hydroxide). It was characterized and sent off site for disposal.
05-20 Aug 15	Motor Oil ½ cup	No	A locomotive owned and operated by New York & Atlantic Railway leaked motor oil on the tracks along Power Line Road, just before the Laboratory exit. The locomotive had recently dropped off a load of empty rail cars for BNL to use for transporting remediation waste. The leak was not discovered until after the locomotive left the site. Most of the leaked motor oil was on top of a railroad tie, although some spilled over onto the soil on either side. Spill absorbent was used to remediate the spill, and the impacted spoil and contaminated absorbent were removed and containerized for off-site disposal.
05-22 Aug 17	Ethylene Glycol 7 gallons	No	A radiator hose ruptured on the "Trackmobile" being used to transport rail cars in support of the Former Hazardous Waste Management Facility cleanup. The operator realized there was a problem and immediately stopped the vehicle and workers placed drip pans and absorbent material under the radiator. Impacted soils, gravel, and debris were removed and placed in a 55-gallon drum for off-site disposal.
05-23 Oct 8	Hydraulic Fluid 5 gallons	No	As concrete blocks were being moved from Bldg. 912 to Bldg. 933 along E. Fifth Avenue, a hydraulic line burst, resulting in a spill of approximately 5 gallons of hydraulic oil along a 1-mile stretch of road. It was raining heavily throughout the day and there was evidence of discharge of the oil into two of the storm sewer drains near Bldg. 912. Fire and Rescue personnel were notified as soon as the spill was discovered. It was contained to the asphalt road and did not come into contact with the soil. Absorbents were placed along the spill areas and along the storm drains. Booms were also placed at the weir (SPDES Outfall #002) to prevent discharge into the recharge basins located near the RHIC Ring. Visual inspection of the weir leading to the recharge basins showed no evidence of discharge of oil into the environment. All contaminated absorbents were collected and disposed off site.
05-27 Nov 4	Gasoline < 1 gallon	No	During routine surveillance of BNL property along North Street, a BNL employee noticed a closed 10-gallon carboy on the east side of North Street approximately 250 yards north of the east gate. The carboy was about 2/3 full and contained what appeared to be waste engine oil. Another 250 yards north, he found an open 5-gallon pail filled with rainwater that had overflowed onto the ground below. The rain water in the pail had a visible sheen and a noticeable gasoline odor. Fire Rescue was notified and placed the 5-gallon pail in an overpak container with contaminated soil they recovered from below the container. The abandoned containers were transported to a waste storage area for characterization and disposal.
05-28 Nov 5	Floor Stripper 1 gallon	Yes SC-BHSO-BNL-PE-2005-0002	Weekend custodial staff dumped floor stripper into the courtyard of Bldg. 911. Stripper, which is highly caustic, was dumped on the bricks and migrated to the side gravel. A field pH reading on litmus paper showed a very high pH. Custodial staff and grounds crew cleaned up the spill and collected all waste for proper disposal.
05-32 Dec 12	Hydraulic Fluid < 1 gallon	No	During the planned decommissioning of an outdoor lift behind Bldg. 480, it was discovered that one of the hydraulic lines had rusted and leaked within the pit of the lift. The piping was removed and the line was capped. The accumulated debris at the bottom of the pit (leaves and sand) was discolored from the oil. The pit had a concrete floor and a drain to prevent water accumulation. All impacted material was removed and containerized for off-site disposal.
05-33 Dec 17	No. 6 Fuel Oil 20 gallons	Yes SC-BHSO-BNL-PE-2005-0003	At approximately 2:30 a.m., a Metro fuel oil tanker came on site to deliver a load of #6 fuel oil, but did not deliver the fuel. In the process, the tanker leaked oil in a trail that was discovered on the northbound William Floyd Parkway, through its route on BNL property, and off site as it traveled southbound on William Floyd Parkway. On the parkway, as well as for most of its route on site, the tanker left one to two thin lines of #6 fuel along its route. Where the tanker slowed or stopped, it left a heavier deposit. This was particularly true at the entrance gate, weigh station, fuel transfer bay, and where the truck took corners. Most significantly, the truck leaked 20 to 25 gallons on the ground and in a catch basin shortly after it pulled out of the transfer bay. The roads, transfer bay, impacted soils, and drywell were cleaned and all spill residue was disposed of off site.

Notes:
*Release is reportable to DOE under the requirements of DOE Order 231.1A, Occurrence Reporting and Processing.
DOT = Department of Transportation

proper spill-response techniques.

In 2005, six incidents reported through ORPS were environmental in nature. Three of these reports were spill-related and have been summarized in Table 3-7; the remaining three 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 fuel oil (principally No. 6 oil) subjects BNL to Major Petroleum Facility licensing by NYSDEC. The Laboratory maintains an MPF License for storing and transferring oil at the Central Steam Facility (CSF). During 2005, BNL remained in full compliance with license requirements, which include monitoring groundwater in the vicinity of the six active, aboveground storage tanks. These tanks range in size from 300,000 to 600,000 gallons. The license also requires the Laboratory to 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 organic compounds and semivolatile organic compounds. In 2005, no contaminants or floating products attributable to MPF activities were detected. See SER Volume II, Groundwater Status Report, for additional information on groundwater monitoring results.

The following upgrades and/or inspections were performed at the MPF in 2005:

- The roof plates and product piping for Tanks No. 5 and 6 were sandblasted, primed, and painted in June 2005.
- Five 60,000-gallon tanks, four of which were never used, were cut into manageable pieces and removed for recycling in May 2005.
- The 2005 NYSDEC annual inspection was conducted in August. Three conditions that required corrective action were noted: the management of vegetative growth in the secondary containment berms at Building 610; peeling and blistering paint causing corrosion to large segments of the product pip-

Table 3-8. Summary of Other Environmental Occurrence Reports.

ORPS* ID: EM-CH-BH-BNL-BNL-2005-0002 Stormwater runoff from a soil contamination area breached a berm constructed to retain the water and prevent cross contamination. Analysis of the water showed it contained between 3,600 and 17,450 pCi/L of cesium-137. The berm was repaired and reinforced with a geomembrane.	Date: 2/10/05 Status: Closed. All corrective actions have been completed.
ORPS ID: EM-CH-BH-BNL-BNL-2005-0003 Flooding occurred at the strontium-90 Groundwater Treatment Pilot System. Evaluation of the incident revealed that the extraction pump was placed in manual-mode "On," which caused the pump to overflow the equalization tank. (In manual mode, the high-level cutout is inoperable.) Approximately 3,500 gallons of water collected on the floor and sumps of the building. Since the facility was designed with secondary containment curbing, there was little run-off outside the building. All water was collected and re-treated prior to disposal.	Date: 2/11/05 Status: Closed. All corrective actions have been completed.
ORPS ID: EM-CH-BH-BNL-BNL-2005-0005 Several rail cars of contaminated soil being shipped from BNL were found to be leaking water upon arrival at Envirocare of Utah. All rail shipments were halted and cars en route were returned to BNL for repackaging. The cause of the leaks was determined to be snow melt and rain water that accumulated between the package containing the waste and the rail car body. Excess moisture was also evident in the waste. Soils were reworked to absorb excess moisture and repackaged for shipment.	Date: 3/21/05 Status: Closed. All corrective actions have been completed.

Notes:
*Reportable under the Occurrence Reporting and Processing System (ORPS), established by the requirements of DOE Order 231.1A.

ing that serves Tanks 651-02, -03, and -04; and heavy staining and product observed near transfer pumps associated with the diesel off-loading station (designated 651-01).

All conditions were 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 that all aboveground tanks larger than 185 gallons and all underground tanks that store specific chemical substances be registered with NYSDEC. The Laboratory 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 2005. During this inspection, three issues were identified that required corrective action: peeling and blistering paint observed on Tanks 634-02, 635-01, and 637-01, causing corrosion to sections of the affected tanks; the need to install a level gauge near the fill port location of Tank 634-02; and the need for a 5-year inspection report for Tanks 624-05 and 624-06. All of these issues were 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 storing and handling toxic and hazardous materials in aboveground or underground storage tanks, 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, the Laboratory entered into a voluntary Memorandum of Agreement with SCDHS, in which DOE and BNL agreed to conform to the environmental requirements of Article 12.

Currently, there are 366 active storage facilities listed in the BNL tanks database. An additional 36 storage facilities are temporarily out of service. Also included in the BNL database are another seven active storage facilities associated with environmental restoration activities conducted under the CERCLA program; these facilities are not regulated under Article 12. Laboratory 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 BNL research.

In 2005, the Laboratory provided SCDHS with updated registrations for more than 35 storage facilities. In addition, SCDHS conducted an inspection of BNL's Motor Pool and Site Service Station underground storage tanks in June 2005 to verify compliance with SCDHS requirements. During this inspection, two minor deficiencies were identified that required corrective action: one related to improper inspection of the interstitial space alarm probes, and the other for deficiencies in the inspection records and scheduled repairs. All deficiencies identified were addressed to Suffolk County's satisfaction.

The Laboratory 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.

3.9 RCRA REQUIREMENTS

The Resource Conservation and Recovery Act 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. The Laboratory 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 one year before shipping them off site to licensed treatment and disposal facilities. As noted in Chapter 2, BNL also has a number of 90-day accumulation and storage areas.

Mixed wastes are materials that are both hazardous (under RCRA guidelines) and radioactive. The Federal Facilities Compliance Act, 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 (federal 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.

The Laboratory updates the BNL Site Treatment Plan annually and submits it to NYSDEC for review. 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. BNL anticipates that it will continue to manage mixed wastes within its permitted one-year time frame. However, the Laboratory will continue to maintain and update its Site Treatment Plan as a reporting mechanism, should waste types or treatment facility availability change in the future.

3.10 POLYCHLORINATED BIPHENYLS

The storage, handling, and use of polychlorinated biphenyls (PCBs) are regulated under the Toxic Substance and Control Act. Capacitors manufactured before 1970 that are believed to be oil filled are handled as if they contain PCBs, even when that cannot be verified from 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. Certain PCB-containing articles or PCB containers must be labeled. The inventory is updated by July 1 of each year. The Laboratory responds to any PCB spill in accordance with standard emergency response procedures. BNL was in compliance with the legislated requirements in 2005.

The Laboratory has aggressively approached significant reductions in its PCB inventory. In 2005, the inventory was reduced by approximately 84 percent, by replacing and disposing of 250 large capacitors from the Collider-Accelerator Department. Since 2003, BNL has reduced its PCB inventory by more than 90 percent.

3.11 PESTICIDES

The storage and application of pesticides (insecticides, rodenticides, herbicides, and algicides) are regulated under the Federal Insecticide, Fungicide and Rodenticide Act. 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. The Laboratory was in full compliance with the legislated requirements in 2005.

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. The Laboratory 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, the Laboratory must comply with the permit conditions.

In 2005, three projects were permitted under this program, all ongoing from 2003/2004. These projects included constructing a new recharge basin, a storage facility at the Alternating Gradient Synchrotron, and ancillary structures at Buildings 1007 and 1009. All projects have been completed except for new structures at Buildings 1007 and 1009, which are no longer planned; the permit will be cancelled in 2006. Final photos and completed project notifications for the finished projects will be filed with NYSDEC in 2006 to close the relevant permits.

3.13 ENDANGERED SPECIES ACT

In 2005, the Laboratory updated its list of endangered, threatened, and species of special concern (see Table 6-1 in Chapter 6).

Although the tiger salamander is no longer the only state endangered species found at BNL, it is the most notable and best-studied species on site. Tiger salamanders are listed as endangered in New York State 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. The Laboratory adopted and implemented the Natural Resource Management Plan (NRMP) in December 2003. One component of the plan formalizes the strategy and actions needed to protect 22 confirmed tiger salamander breeding locations 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 requirements and salamander movement.

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. Eastern Long Island has the only known remaining populations of these fish in New York. Measures taken or being taken by the Laboratory to protect the banded sunfish and swamp darter and their habitat include the following:

- Eliminating, reducing, or controlling pollutant discharges
- Reducing nitrogen loading in the Peconic River
- Monitoring populations and water quality to ensure that habitat remains viable
- Maintaining adequate flow to the river to enable the fish to survive drought
- Minimizing disturbances to the river and adjacent banks

Three butterfly species that are endangered, threatened, or of special concern have been historically documented at the Laboratory; these include the frosted elfin, persius duskywing, and mottled duskywing. None have been documented in recent surveys. Habitat for the frosted elfin and persius duskywing exists on Laboratory property and mottled duskywing is likely to exist on site; therefore, the management of habitat and surveys for the three butterflies has been added to the management plan.

Surveys for damselflies and dragonflies conducted annually during the summer months confirmed the presence of one of the three threatened species of damselflies expected to be found on the Laboratory site. In June 2005, the pine-barrens bluet (*Enallagma recurvatum*), a threatened species, was documented at one of the many coastal plain ponds located at BNL.

The Laboratory is also home to 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 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 the Laboratory. Radio telemetry work on the spotted turtle was carried out in 2004 – 2005, and a basic understanding of their movement and habitat needs was developed. A radio telemetry study on the eastern hognose snake continued in 2005, 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. 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.

The Laboratory has 20 plant species that are 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. As outlined in the management plan, the locations of these rare plants must be determined, populations estimated, and management requirements established. See Chapter 6 for more information.

3.14 EXTERNAL AUDITS AND OVERSIGHT

A number of federal, state, and local agencies oversee Laboratory activities. In 2005, BNL was inspected by federal, state, or local regulators on 11 occasions. In 2005, SCDHS maintained a part-time, on-site staffer who provided periodic oversight of BNL activities. In addition to external audits and oversight, the Laboratory has a comprehensive self-assessment program, as described in Chapter 2.

3.14.1 Regulatory Agency Inspections

- *Air Compliance*. NYSDEC conducted an annual inspection of the CSF in March. No issues were identified during this inspection.
- *Potable Water.* In October 2005, SCDHS collected samples and conducted its annual inspections of the BNL potable water system to ensure that facilities are maintained. No issues were identified. All sample results were within DWS, except for iron, which occurs naturally in some of the wells. As noted in Section 3.7.1, the Laboratory treats the water from certain supply wells to remove iron before distribution.
- *Sewage Treatment Plant.* SCDHS conducts quarterly inspections of the Laboratory's Sewage Treatment Plant, to evaluate operations and sample the effluent. In 2005, no performance or operational issues were identified. NYSDEC also conducts annual inspections of the STP, and identified no issues in 2005.
- *Recharge Basins.* As part of SCDHS oversight, recharge basins and other SPDES outfalls are inspected periodically. In March 2005, SCDHS inspected several of the outfalls and collected samples. Sediment collected at Outfall 010 contained elevated levels of lead. This issue is discussed further in Chapter 5. NYSDEC also conducted inspections of the recharge basin outfalls in March; no issues were identified.
- *Major Petroleum Facility.* The annual NYSDEC inspection of the MPF was conducted in August 2005 (see Section 3.8.4).
- *Chemical Bulk Storage Facilities*. The CBS facilities are inspected periodically by NYSDEC. This inspection was conducted in August 2005 (see Section 3.8.5).

3.14.2 DOE Inspections

DOE Headquarters (EH-10) and the Chicago Support Center did not conduct assessments of the Laboratory's environmental programs in 2005. However, the DOE Brookhaven Site Office (DOE-BHSO) continued to oversee BNL programs and observed programmatic assessments of the environmental monitoring, NEPA programs, and the hazardous waste characterization process. The results of these assessments are summarized below. In all cases, corrective actions were implemented to correct the deficiencies identified.

3.14.2.1 Environmental Monitoring

The Environmental and Waste Management Services Division (EWMSD) conducted a self-assessment to ensure that sample collection meets regulatory requirements and the BNL Environmental Monitoring Plan, and that past monitoring issues had been adequately addressed. The assessment was conducted between March 7 and April 8, as part of the EWMSD self-assessment program, and included DOE-BHSO observation. While prior assessments have looked at some aspects of monitoring, this was the first full-scale review of the environmental monitoring program. Specifically, the assessment focused on:

- Documentation of environmental monitoring requirements
- Adequacy of sample collection programs
- Adequacy of collection procedures
- Followup to previously identified monitoring concerns

Sample collection activities were reviewed in the EWMSD and the Plant Engineering (PE) and Environmental Restoration (ER) divisions. In addition, a review was held of the processes used by the Collider–Accelerator Department and the PE Division to determine if environmental monitoring is required for new facilities and operations. The assessment involved documentation review, including SPDES permits, ER SPDES and Air permit equivalencies, ER operations manuals, environmental monitoring standard operating procedures, and the BNL Environmental Monitoring Plan. The review also involved field observations of sample collections (radiation sensors, liquid effluents, surface water, groundwater, and air) and interviews with subject-matter experts, sampling technicians, and line personnel. Whenever possible, representatives from DOE's on-site office participated in the review.

The assessment found three noteworthy practices, two nonconformances, four observations, and five opportunities for improvement. Overall, the assessment concluded that the environmental monitoring program is well documented and is effective for measuring compliance with regulatory requirements and impacts of Laboratory operations on the environment. There were no regulatory noncompliances identified during the assessment (Lee 2005).

3.14.2.2 NEPA Management

In late 2004, EWMSD conducted a self-assessment, with DOE-BHSO observation, using the SBMS subject area "National Environmental Policy Act and Cultural Resources Evaluations." The report was finalized in January 2005. The audit included examinations of the federal Proposal Information Questionnaire (PIQ) database – 2004, the nonfederal PIQ database – 2004, capital procurements in excess of $25,000 for FY 2004, departmental NEPA reviews, and the prior assessment, conducted during 2001. The assessment also involved interviews with line personnel responsible for implementing NEPA requirements. The review found three noteworthy practices, no nonconformances, one observation, and three opportunities for improvement (Pohlot 2005).

3.14.2.3 Waste Characterization

An assessment of waste characterization methods performed at the generator level was conducted from September 22 to September 29, 2005, to ensure that radioactive and nonradioactive wastes presented to BNL's waste management program for treatment and/or disposal were properly documented. Documentation helps ensure that wastes are managed in compliance with applicable regulations and disposal facility waste acceptance criteria. The assessment found that the methods employed and the documentation/process knowledge used to support

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

Number	Title	Parties	Effective Date	Status
Agreements				
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	Federal Facilities Compliance Agreement on Mixed Wastes	NYS-DEC 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 2005.
Enforcement Actions: None				

Notes:
EPA = Environmental Protection Agency
NYSDEC = New York State Department of Environmental Conservation
SCDHS = Suffolk County Department of Health Services

the waste's characterization data were effective. It was noted that of the 20 waste items assessed, supporting information for four of the items was not initially provided with the waste documentation, but was supplied by the originating group when requested.

3.14.3 Enforcement Actions and Memos

No new consent orders nor Notices of Violation were issued to the Laboratory in 2005. All existing enforcement actions and memoranda 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. When a Notice of Violation is issued, the Laboratory works with the regulators to close these actions as expeditiously as possible. In October, BNL was informed that one such notice was pending with NYSDEC for opacity violations reported in quarterly emission reports. To date, the notice has not been received and the Laboratory continues to address the issue with NYSDEC.

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