



Chapter 3 Compliance Status



Brookhaven National Laboratory (BNL) is subject to more than 100 sets of federal, state, and local environmental regulations; numerous site-specific permits; 11 equivalency permits for operation of groundwater remediation systems; and several other binding agreements.

In 2023, 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.

Emissions of nitrogen oxides, carbon monoxide, and sulfur dioxide from the Central Steam Facility (CSF) were all well within permit limits in 2023. There were four recorded excess opacity measurements and one recorded excess nitrogen oxide measurement. One excess nitrogen oxide measurement was caused by a failed fuel oil meter asso-

ciated with Boiler 6. Four excess opacity readings were recorded by Boiler 7 and were due to load shifts or boiler tuning. All excursions were documented in quarterly Site-Wide Air Emissions and Monitoring Systems Performance Reports submitted to the New York State Department of Environmental Conservation (NYSDEC).

In 2023, there were no discharges of Halon 1211 from portable fire extinguishers or Halon 1301 from accidental or fire induced activation of fixed fire suppression systems. Halon portable fire extinguishers continue to be removed and



Field Sampling Team in front of BNL Geoprobe®.

replaced by dry-chemical or clean agent units as part of an ongoing program to phase out the use of chlorofluorocarbons as extinguishing agents. BNL's drinking water and the supply and distribution system were in compliance with all applicable county, state, and federal regulations regarding drinking water quality, monitoring, operations, and reporting in 2023. Most of the liquid effluents discharged to surface water and groundwater also met applicable New York State Pollutant Discharge Elimination System (SPDES) permit requirements. There was one excursion above permit limits reported for the year; a sample collected from Outfall 006B (HT-E) for routine monthly compliance analysis exhibited an oil and grease concentration of 163 mg/L, which is above the permit limit of 15 mg/L. The permit excursion was reported to NYSDEC and the Suffolk County Department of Health Services (SCDHS) and corrective measures were taken. Groundwater monitoring at the Laboratory's Major Petroleum Facility (MPF) continued to demonstrate that current oil storage and transfer operations were not affecting groundwater quality. Efforts to implement release prevention measures and minimize impacts of spills of materials continued in 2023. There were eighteen spills in 2023 and eight of those spills met regulatory agency reporting criteria.

In 2023, BNL was inspected on seven occasions. These inspections included Sewage Treatment Plant (STP) operations, hazardous waste management facilities, and the potable water system. Immediate corrective actions were taken to address all compliance issues raised during these inspections.



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. A list of all applicable environmental regulations is contained in Appendix D.

Regulator: Codified Regulation	Regulatory Program Description	Compliance Status	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 re- leases of hazardous substances and remediation (including decontamination and decommission- ing [D&D]) of inactive hazardous waste disposal sites. Regulators include Environmental Protection Agency (EPA), Department of Energy (DOE), and the New York State Department of Environmental Conservation (NYSDEC).	In 1992, BNL became subject to a tri-party agreement among EPA, NYSDEC, and DOE. BNL site remediation is conducted by the Environmental Protection Division in ac- cordance with milestones established under this agreement. The cleanup is currently in the long-term surveillance and maintenance mode for the groundwater treatment systems, former soil/sediment cleanup areas, and the reactors, and includes monitoring of institutional controls. The HFBR reac- tor vessel is scheduled for decontamination and decommis- sioning by 2072. All groundwater treatment systems operated as required in 2023. Management of the characterization and remediation of PFOS, PFOA, and 1,4-dioxane was formally included under the BNL CERCLA program.	2.3.4.8, Chapter 7
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 environ- ment of proposed major federal actions and alter- natives. DOE codified its implementation of NEPA in 10 CFR 1021.	BNL is in full compliance with NEPA requirements. The Laboratory has established site-wide procedures for imple- menting 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 proper- ties 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 State, NYSHPO). At BNL, structures that are subject to NHPA include the HFBR complex (Bldgs. 750 and 751), the Brookhaven Graphite Research Reactor (BGRR) complex (Bldgs. 701, 703, and 801), 1960's era Apartments (Bldgs. 364 and 365,), Bldg. 120, Berkner Hall (Bldg.488), Chemistry (Bldg. 555), Physics (Bldg. 510), Computational Sciences (Bldg. 515), Instrumentation (Bldg. 535), Medical (Bldgs. 490 and 491), WWII-era water tower (ST0- 49), Accelerator Test Facility (Bldgs. 820, 820A, and 820B), Environment, Biology, Nuclear Science and Nonproliferation (EBNN) research (Bldg. 830), Magnet Division (Bldg. 902), Alternating Gradient Synchrotron complex (Bldgs. 901, 901A, 911, 912, 913, 913a-e, and .930), the Gamma Forest, and the WWI training trenches found throughout the site.	There are now multiple buildings and features at BNL that have been determined to be National Register Eligible (see list to the left). Any proposed activities involving these facili- ties must be identified through the NEPA/NHPA processes and evaluated to determine if the action would affect the features that make the facility eligible. BNL has a Cultural Resource Management Plan to ensure compliance with cultural resource regulations. Buildings that are 50 years old or older are reviewed under Section 106 of NHPA when proposed projects may significantly alter the structure or for building demolition. See Chapter 6 for detailed information on Cultural Resources.	3.4, Chapter 6

Table 3-1. Federal.	State.	and Local	Environmental	Statutes a	and Reaul	ations App	licable to B ^I	NL.
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Table 3-1. Federal, State, and Local Environmental Statutes and Regulations Applicable to	o BNL
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Regulator: Codified Regulation	Regulatory Program Description	Compliance Status	Report Sections
EPA: 40 CFR 50 40 CFR 60-61 40 CFR 63 40 CFR 80 40 CFR 82 40 CFR 98 NYSDEC: 6 NYCRR 200-202, 205, 207, 208, 211, 212, 215, 217, 218, 225, 226, 227-231, 239, 241, 248, 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 regu- lated by EPA via the National Emission Standards for Hazardous Air Pollutants (NESHAPs) authoriza- tions.	All air emission sources are incorporated into the BNL Title V permit or have been exempted under the New York State air program, which is codified under the New York Codes, Rules, and Regulations (NYCRR). All applicable CAA and NYCRR regulations are incorporated into the BNL Title V permit. Radiological air emission sources are registered with the EPA.	3.5, Chapters 4 and 8
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. Except for one oil and grease excursion at Outfall 006B (HT-E), all other discharges met the SPDES permit limits in 2023.	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) stan- dards for public water supplies establish minimum drinking water standards and monitoring require- ments. SDWA requirements are enforced by the Suffolk County Department of Health Services (SCDHS).	BNL maintains a site-wide public water supply. BNL's drinking water and the supply and distribution system were in compliance with all applicable county, state, and federal regulations regarding drinking-water quality, monitoring, operations, and reporting in 2023. Corrective actions for all identified operation and maintenance deficiencies identified during the annual SCDHS sanitary survey were established and communicated with SCDHS and are being addressed by the Laboratory's Energy and Utilities Division.	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 and 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 emer- gency 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 quanti- ties, the Laboratory is subject to these requirements. BNL fully complied with all reporting and emergency planning requirements in 2023.	3.8.1 3.8.2 3.8.3
EPA: 40 CFR 280 NYSDEC: 6 NYCRR 596–598 6 NYCRR 613 SCDHS: SCSC Article 12 SCSC Article 18	Federal, state, and local regulations govern the storage of chemicals and petroleum products to prevent releases of these materials to the environ- ment. Suffolk County Sanitary Codes (SCSC) are more stringent than federal and state regula-tions.	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 continues to conform to county codes.	3.8.4 3.8.5 3.8.6
EPA: 40 CFR 260–280 NYSDEC: 6 NYCRR 360, 361, 363-365, 367,371- 374, and 376	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.	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, and is in compliance with all requirements.	3.10

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Table 3-1. Federal, State, and Local Environmental Statutes and Regulations Applicable to BNL.	
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Regulator: Codified Regulation	Regulatory Program Description	Compliance Status	Report Sections
EPA: 40 CFR 162–171 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, herbicides, biocides, rodenticides, fungicides, tickicides, as well as the pesticide containers and residuals.	BNL contracts and/or employs NYSDEC-certified pes- ticide applicators for specific pesticide categories to apply pesticides, herbicides, biocides, rodenticides, fungicides, and tickicides. Each applicator attends Continuing Education training, as needed, to maintain current category certifica- tions and BNL (or the contractor that applies regulated mate- rials) files an annual report to the NYSDEC Pesticide Bureau detailing the above applications including EPA Registration Nos., dates of applications, method of application, target organisms, types, locations, quantity, and dosage rates of pesticides applied.	3.11
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 regu- lated 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. BNL currently has no open wetland or scenic river permits.	3.12
U.S. Fish & Wildlife Service: 50 CFR 17 NYSDEC: 6 NYCRR 182	The Endangered Species Act and correspond- ing 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.	BNL is host to numerous species of flora and fauna. Many species have been categorized by New York State as endangered, threatened, or of special concern; and one endangered species has been designated under the Endangered Species Act. The Laboratory's Natural Resource Management Plan outlines activities to protect these vulner- able species and their habitats (see Chapter 6 for details).	3.13, Chapter 6
U.S. Fish & Wildlife Service: Migratory Bird Treaty Act 16 USC 703-712 The Bald and Golden Eagle Protection Act 16 USC 668 a-d	The Migratory Bird Treaty Act (MBTA) imple- ments various treaties and conventions between the U.S. and Canada, Japan, Mexico, and the former Soviet Union for the protection of migratory birds. Under the Act, taking, killing, or possessing migratory birds is unlawful. Birds protected under the act include all common songbirds, waterfowl, shorebirds, hawks, owls, eagles, ravens, crows, native doves and pigeons, swifts, martins, swal- lows, and others, and includes their body parts (feathers, plumes, etc.), nests, and eggs. The Bald and Golden Eagle Protection Act (BGEPA) prohibits any form of possession or taking of both bald and golden eagles.	Compliance with the MBTA and the BGEPA are document- ed through the BNL Natural Resource Management Plan. The plan includes provisions for enhancing local habitat through the control of invasive species, planting of native grasses as food sources, and construction of nesting sites. All construc- tion activities, including demolition, are reviewed to ensure there are no impacts to nesting birds. Bald Eagles have been seen routinely at various locations on the BNL site. See Chapter 6 for more on migratory birds and bald eagles.	3.13, Chapter 6
DOE: Order 231.1B Manual 231.1-1A	The Environment, Safety, and Health Reporting program objective is to ensure timely collection, re- porting, analysis, and dissemination of information on environment, safety, and health issues as re- quired 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 cred- ibility of the Department. Included in the order are the requirements for the Occurrence Reporting and Processing of Operations Program (ORPS).	BNL prepares an annual Site Environmental Report and provides data for DOE to prepare annual NEPA summaries and other Safety, Fire Protection, and Occupational Health and Safety Administration (OSHA) reports. The Laboratory 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: Occurrence Reporting Program Description, Occurrence Categorizer's Procedure, and the ORPS Office Procedure.	All chapters

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

Regulator: Codified Regulation	Regulatory Program Description	Compliance Status	Report Sections
DOE: Order 414.1D 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/Rule, coupled with consensus standards, where appro- priate, to ensure: 1) products and services meet or exceed customers' expectations; 2) management support for planning, organization, resources, direction, and control; 3) performance and quality improvement thorough rigorous assessment and corrective action and; and 4) environmental, safety, and health risks and impacts associated with work processes are minimized while maximizing reliabil- ity and performance of work products.	BNL has a Quality Assurance (QA) Program in place to implement quality management methodology throughout its management systems and associated processes to: (1) achieve and maintain compliance with applicable environ- mental, safety, security, and health (ESSH) requirements; (2) continue improvement in ESSH performance; (3) provide a safe and healthy workplace; (4) protect the environment and conserve resources; (5) prevent pollution; (6) provide ser- vices and products of the highest quality consistent with the needs, expectations, and resources of our customers; and (7) continuously improve processes, systems, and capabili- ties to improve operations and increase the value of research products delivered to customers. Having a comprehensive program ensures that all environ- mental monitoring data meet QA and quality control require- ments. 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 ac- curacy. 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 Chg. 2 & Chg. 3	The Radioactive Waste Management Program objective is to ensure that all DOE radioactive waste is managed in a manner that protects work- ers, public health and safety, and the environment. 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 both routine and non-routine radioac- tive wastes.	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 activi- ties that do not fall within the scope of the RWMB Program description must be documented and approved before imple- mentation. The Laboratory's RWMB Program description describes the BNL policies, procedures, plans, and controls demonstrating that the Laboratory has the management systems, administrative controls, and physical controls to comply with DOE Order 435.1 Chg. 2 & 3.	2.3.4.3
DOE: Order 436.1A	The DOE Departmental Sustainability Order was revised and reissued as 436.1A. The intent of the new order is to incorporate and implement the requirements of various Executive Orders (EO), primarily EO 14057, which direct federal agencies to address climate change by setting Net Zero goals for federal facilities. Contractor requirements under the order continue to require preparation of a Site Sustainability Plan and implementation of a sound Environmental Management System (EMS) that reflect the Net Zero goals.	In accordance with the requirements of the DOE Strategic Sustainability Performance Plan (SSPP), and DOE O 436.1A, BNL has developed and implemented a Site Sustainability Plan. The Goals and Strategic Objectives of the DOE SSPP are tracked and reported to DOE annually. BNL's EMS continues to be registered to the ISO 14001:2015 revised standard through September 2024.	Chapter 2

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Regulator: Codified Regulation	Regulatory Program Description	Compliance Status	Report Sections
DOE: Order 458.1, Change 4	In February 2011, DOE released DOE Order 458.1 Radiation Protection of the Public and Environment, which replaced former Order 5400.5. The order establishes requirements to protect the public and the environment against undue risk from radiation associated with radiological activities conducted under the control of DOE pursuant to the Atomic Energy Act of 1954, as amended. The Order requires the preparation of an Environmental Radiation Protection Plan which outlines how facilities monitor their impacts on the public and environment. Full compliance with the Order was required by August 2012.	In accordance with the requirements of DOE Order 458.1, BNL maintains and implements several plans and pro- grams for ensuring that the management of facilities, wastes, effluents, and emissions does not present a risk to the public, workers, or environment. These plans and programs have existed for decades and were previously implemented under prior DOE Order 5400.5 and in accordance with the current DOE O 435.1, Radioactive Waste Management, and 10 CFR 835. Environmental monitoring plans are well documented, and the results are published annually in BNL's Site Environmental Report, which is prepared in accordance with DOE O 231.1B. The Environmental Radiation Protection Program (ERPP), which was published in September 2012, provides a record of the requirements of DOE O 458.1 and documents how the Laboratory meets these requirements. This document is reviewed annually and updated, as neces- sary to ensure compliance with this requirement.	Chapters 3, 4, 5, 6, and 8

Notes:

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

3.2 Compliance with Requirements

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.

- SPDES permits, issued by NYSDEC;
- MPF license, issued by NYSDEC;
- Resource Conservation and Recovery Act (RCRA) permit, issued by NYSDEC for BNL's Waste Management Facility;
- Registration certificate from NYSDEC for tanks storing bulk quantities of hazardous substances (e.g., fuel oil);
- Nine radiological emission authorizations issued by the U.S. Environmental Protection Agency (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 (CAA) Amendments authorizing the operation of 12 emission units;
- Permit for the operation of six domestic water supply wells, one cooling water well, one irrigation well, and one fire protection well issued by NYSDEC;
- 11 SPDES equivalency permits for the operation of groundwater remediation systems installed via the Interagency Agreement (Federal Facility Agreement under the Comprehensive Environmental Response, Compensation and Liability Act [CERCLA]).



Table 3-2. BNL Environmental Permits.

	51.1			Expiration		•
Issuing Agency	Bidg. or Facility	Process/Permit Description	Permit ID No.	or Completion	Emission Unit ID	Source ID
EPA - NESHAPs	510	Calorimeter Enclosure	BNL-689-011	None	NA	NA
EPA - NESHAPs	705	Tritium Evaporator	BNL-288-01 ¹	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-388-01	None	NA	NA
EPA - NESHAPs	931	Brookhaven LINAC Isotope Producer	BNL-2009-1	None	NA	NA
EPA - NESHAPs	REF	Radiation Effects/Neutral Beam	BNL-789-01	None	NA	NA
EPA - NESHAPs	RTF	Radiation Therapy Facility	BNL-489-01 ¹	None	NA	NA
EPA - NESHAPs	801	All-inclusive Production Hot Cells (RRPL)	BNL-2022-01	None	NA	NA
NYSDEC - Air Equivalency	517/518	South Boundary/Middle Road 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	B-96 Remediation System	1-52-009	NA	NA	NA
NYSDEC - Air Equivalency	644	Freon-11 Treatment System	1-52-009	NA	NA	NA
NYSDEC - SPDES Permit	Site	Brookhaven National Laboratory	NY0005835	31-Dec-30	NA	NA
NYSDEC - SPDES Equivalency	517/518	South Boundary/Middle Road System	1-52-009	NA	NA	NA
NYSDEC - SPDES Equivalency	539	Western South Boundary System	1-52-009	NA	NA	NA
NYSDEC - SPDES Equivalency	670	Sr-90 Treatment System - Chemical Holes	1-52-009	25-Feb-33	NA	NA
NYSDEC - SPDES Equivalency	0S-4	Airport/LIPA Treatment System	1-52-009	NA	NA	NA
NYSDEC - SPDES Equivalency	0S-5	North St./North St. East Treatment System	1-52-009	26-Mar-25	NA	NA
NYSDEC - SPDES Equivalency	0S-6	Ethylene Di-Bromide Treatment System	1-52-009	26-Mar-25	NA	NA
NYSDEC - SPDES Equivalency	855	Sr-90 Treatment System - BGRR/WCF	1-52-009	26-Mar-25	NA	NA
NYSDEC - SPDES Equivalency	TR 867	B-96 Remediation System	1-52-009	20-Mar-32	NA	NA
NYSDEC - SPDES Equivalency	0S-2	Industrial Park Treatment System	1-52-009	26-Mar-25	NA	NA
NYSDEC - SPDES Equivalency	492	Current Firehouse PFAS Treatment System	1-52-009	07-Sep-32	NA	NA
NYSDEC - SPDES Equivalency	492	Former Firehouse PFAS Treatment System	1-52-009	07-Sep-32	NA	NA
NYSDEC - Hazardous Substance	BNL	Bulk Storage Registration Certificate	1-000263	27-Jul-25	NA	NA
NYSDEC - LI Well Permit	BNL	Domestic Potable/Process Wells	1-4722-00032/00151	17-Jul-26	NA	NA
NYSDEC - Air Quality	423	Metal Parts Cleaning Tank	1-4722-00032/00115	30-Jan-25	U-METAL	42308
NYSDEC - Air Quality	423	Gasoline & E85 Storage and Fuel Pumps	1-4722-00032/00115	30-Jan-25	U-FUELS	42309-10
NYSDEC - Air Quality	423	Motor Vehicle A/C Servicing	1-4722-00032/00115	30-Jan-25	U-MVACS	MVAC2
NYSDEC - Air Quality	423	Motor Vehicle A/C Servicing	1-4722-00032/00115	30-Jan-25	U-MVACS	MVAC5
NYSDEC - Air Quality	244	Paint Spray Booth	1-4722-00032/00115	30-Jan-25	U-PAINT	24402
NYSDEC - Air Quality	244	Flammable Liquid Storage Cabinet	1-4722-00032/00115	30-Jan-25	U-PAINT	244AE
NYSDEC - Air Quality	734	Spin Coating Operation	1-4722-00032/00115	30-Jan-25	U-INSIG	734AA
NYSDEC - Air Quality	801	Target Processing Laboratory	1-4722-00032/00115	30-Jan-25	U-INSIG	80101

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				Expiration		
Issuing Agency	Bldg. or Facility	Process/Permit Description	Permit ID No.	or Completion	Emission Unit ID	Source ID
NYSDEC - Air Quality	Site	Aerosol Can Processing Units	1-4722-00032/00115	30-Jan-25	U-INSIG	AEROS
NYSDEC - Air Quality	498	Aqueous Cleaning Facility	1-4722-00032/00115	30-Jan-25	U-METAL	49801
NYSDEC - Air Quality	610	Combustion Unit	1-4722-00032/00115	30-Jan-25	U-61005	61005
NYSDEC - Air Quality	610	Combustion Unit	1-4722-00032/00115	30-Jan-25	U-61006	61006
NYSDEC - Air Quality	610	Combustion Unit	1-4722-00032/00115	30-Jan-25	U-61007	61007
NYSDEC - Air Quality	610	Metal Parts Cleaning Tray	1-4722-00032/00115	30-Jan-25	U-METAL	61008
NYSDEC - Air Quality	610	Combustion Unit	1-4722-00032/00115	30-Jan-25	U-61005	6101A
NYSDEC - Air Quality	902	Epoxy Coating/Curing Exhaust	1-4722-00032/00115	30-Jan-25	U-COILS	90206
NYSDEC - Air Quality	922	Electroplating Operation	1-4722-00032/00115	30-Jan-25	U-INSIG	92204
NYSDEC - Air Quality	Site	Commercial Refrigeration Equipment	1-4722-00032/00115	30-Jan-25	U-RFRIG	COMRE
NYSDEC - Air Quality	Site	Packaged A/C Units (16)	1-4722-00032/00115	30-Jan-25	U-RFRIG	PKG01-16
NYSDEC - Air Quality	Site	Reciprocating Chillers (44)	1-4722-00032/00115	30-Jan-25	U-RFRIG	REC01-65
NYSDEC - Air Quality	Site	Rotary Screw Chillers (19)	1-4722-00032/00115	30-Jan-25	U-RFRIG	R0T01-20
NYSDEC - Air Quality	Site	Split A/C Units	1-4722-00032/00115	30-Jan-25	U-RFRIG	SPL01-02
NYSDEC - Air Quality	Site	Centrifugal Chillers (17)	1-4722-00032/00115	30-Jan-25	U-RFRIG	CEN06-29
NYSDEC - Air Quality	463	Diesel Emergency Generator	1-4722-00032/00115	30-Jan-25	U-GENER	46301
NYSDEC - Air Quality	490	Diesel Emergency Generator	1-4722-00032/00115	30-Jan-25	U-GENER	49006
NYSDEC - Air Quality	515	Diesel Non-Emergency Generator	1-4722-00032/00115	30-Jan-25	U-GENER	51501
NYSDEC - Air Quality	555	Diesel Emergency Generator	1-4722-00032/00115	30-Jan-25	U-GENER	55503
NYSDEC - Air Quality	635	Diesel Emergency Generator	1-4722-00032/00115	30-Jan-25	U-GENER	63501
NYSDEC - Air Quality	734	Diesel Emergency Generator	1-4722-00032/00115	30-Jan-25	U-GENER	73401
NYSDEC - Air Quality	735	Diesel Emergency Generator	1-4722-00032/00115	30-Jan-25	U-GENER	73501
NYSDEC - Air Quality	740	Diesel Emergency Generators (2)	1-4722-00032/00115	30-Jan-25	U-GENER	74001-02
NYSDEC - Air Quality	801	Diesel Emergency Generator	1-4722-00032/00115	30-Jan-25	U-GENER	80102
NYSDEC - Air Quality	912	Diesel Emergency Generators (3)	1-4722-00032/00115	30-Jan-25	U-GENER	912A1-A3
NYSDEC - Air Quality	30	Combustion Unit	1-4722-00032/00115	30-Jan-25	U-SMBLR	030AB
NYSDEC - Air Quality	422	Combustion Unit	1-4722-00032/00115	30-Jan-25	U-SMBLR	422AF
NYSDEC - Air Quality	423	Combustion Unit	1-4722-00032/00115	30-Jan-25	U-SMBLR	42304
NYSDEC - Hazardous Waste	WMF	Waste Management	1-4722-00032/00102	06-Sep-27	NA	NA
NYSDEC - Water Quality	CSF	Major Petroleum Facility	01-1700	31-Mar-27	NA	NA

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

Notes:

¹Source Facility Removed and awaiting EPA termination of NESHAPs authorization. A/C = Air Conditioning PFAS = Per and Poly Fluoroalkyl Substances

AGS = Alternating Gradient Synchrotron

RTF = Radiation Therapy Facility

BGRR = Brookhaven Graphite Research Reactor

RHIC = Relativistic Heavy Ion Collidar

CSF = Central Steam Facility

RRPL = Radionuclide Research and Production Laboratory

EPA = Environmental Protection Agency

SDWA = Safe Drinking Water Act

LIPA = Long Island Power Authority SPDES = State Pollutant Discharge Elimination System NA = Not Applicable Sr-90 = Strontium-90 NESHAPs = National Emission Standards for Hazardous Air Pollutants STP = Sewage Treatment Plant NYSDEC = New York State Department of Environmental Conservation WCF = Waste Concentration Facility OU = Operable Unit WMF = Waste Management Facility



3.2.2 New or Modified Permits

3.2.2.1 New York State Wetlands and Wild, Scenic, Recreational Rivers Act

The New York State Wild, Scenic, and Recreational Rivers Act was created by the state legislature in 1972 to protect and preserve certain rivers considered to have remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values. The Laboratory had no open permits in 2023.

3.2.3 EPA's Enforcement & Compliance History Online (ECHO)

EPA's ECHO provides integrated compliance and enforcement information for more than one million regulated facilities nationwide. It allows users to search for facilities by media program (e.g., CAA, Clean Water Act [CWA], Safe Drinking Water Act [SDWA]), location, enforcement and compliance activity, or pollutant. The facility reports include three years of violation data and five years of compliance monitoring and enforcement data.

A detailed facility report for BNL including compliance status can be found in the ECHO database at: https:// echo.epa.gov/. To access this report, use the following information:

ECHO Facility Name:

Brookhaven National Laboratory

Facility Registry Service (FRS) ID:

110000616726

Program Areas:

CAA, CWA, RCRA, SDWA

3.3 National Environmental Policy Act (NEPA) Assessments

NEPA regulations require federal agencies to evaluate the environmental effects of proposed major federal activities. The prescribed evaluation process ensures that the proper level of environmental review is performed before an irreversible commitment of resources is made. During 2023, environmental evaluations were completed for 131 proposed projects at BNL. One hundred and twenty-six projects were considered minor actions requiring no additional documentation. Five projects were addressed by submitting a notification form to the Department of Energy (DOE), which determined that the projects were covered by existing "Categorical Exclusions" (per 10 CFR 1021) or fell within the scope of a previous environmental assessment, and one Environmental Assessment was initiated to evaluate potential impacts of a new proposed facility.

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 laws 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 or cultural groups. BNL has 34 structures or sites that are eligible for listing on the National Register of Historic Places: the Brookhaven Graphite Research Reactor (BGRR) complex (Buildings 701, 703, and 801), the High Flux Beam Reactor (HFBR) complex (Buildings 750, 750A, and 751), two 1960s-era efficiency apartments (Buildings 364 and 365), Berkner Hall (Building 488), Medical Complex (Buildings 490 and 491), Chemistry (Building 555), Physics (Building 510), Computational Sciences (Building 515), Instrumentation (Building 535), Accelerator Test Facility (Buildings 820, 820A, and 820B), Environment, Biology, Nuclear Science & Nonproliferation Research (Building 830), Magnet Division (Building 902), the Alternating Gradient Synchrotron (AGS) Complex (Buildings 901, 901A, 911, 912, 913, 913A-E, and 930), the World War II (WWII) barracks portion of Building 120, the 1940s era Water Tower, the World War I (WWI) Army training trenches associated with Camp Upton, and the Gamma Forest. Cultural resource activities are described in Chapter 6.

3.5 Clean Air Act (CAA)

The objectives of the 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 CSF that are subject to NYSDEC Reasonably Available Control Technology (RACT) requirements. Three of the boilers can burn either residual fuel oil or natural gas; Boiler 1A burns residual fuel oil only. In 2023, natural gas was the predominant fuel burned at the CSF. For boilers with maximum operating heat inputs greater than or equal to 25 MMBtu/hr. (7.3 MW), the RACT requirements establish emission standards for oxides of nitrogen (NO_x). The NO_x RACT standard for the combustion of natural gas and No. 6 oil burned in the Laboratory's three large boilers (Nos. 5, 6, and 7) is 0.15 lbs./ MMBtu for both fuels. The NO_x RACT emission limit for the CSF's one mid-size boiler (No. 1A) is 0.20 lbs./MMBtu.

Boilers with a maximum operating heat input between 25 and 250 MMBtu/hr. (7.3 and 73.2 MW) can demonstrate compliance with the NO_x standard using periodic emission tests or by using continuous emission monitoring equipment; all four CSF boilers fall in this operating range.

Boilers 6 and 7 use continuous emission monitoring systems (CEMS) to demonstrate compliance with NO_x standards. Because past emissions testing and CEMS results when No. 6 oil was burned have shown that CSF boilers 5, 6, and 7 cannot meet the new lower NO_x RACT standards effective as of July 2014, BNL uses an approved system averaging plan to demonstrate compliance in quarterly reports submitted to NYSDEC.

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 the measurement in percent attenuated. Opacity limitations state that no facility may emit particulates such that the opacity exceeds 20 percent, calculated in six-minute averages, except for one period not to exceed 27 percent in any one hour. During 2023, there were no recorded exceedances of the NO_v RACT limit by the Boiler 6 or Boiler 7 CEMS. Using the system



averaging approach, actual weighted average NO_x emission rates for operating boilers for the first through fourth quarters were 0.113, 0.113, 0.096, and 0.096 lbs./MMBtu, respectively, which were below the corresponding quarterly permissible weighted average emissions rates of 0.150, 0.150, 0.150, and 0.151 lbs./ MMBtu each quarter.

In 2023, there were four recorded excess opacity measurements. The excess opacity readings were recorded by Boiler 7 and were due to load shifts or boiler tuning. One excess NO_x measurement was recorded at Boiler 6 and was associated with a failed fuel oil meter. All the excursions were documented in quarterly Site-Wide Air Emissions and Monitoring Systems Performance Reports submitted to NYSDEC. Chapter 4 discusses CSF compliance with NO_x RACT standards and opacity limits in greater detail.

3.5.1.2 Ozone-Depleting Substances

Refrigerant: 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 are certified to meet refrigerant evacuation levels specified by 40 CFR 82.158. As a matter of BNL's standard practice, 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 is more stringent than the leak repair provisions of 40 CFR 82.156. In 2023, 105 pounds of R-22 and 30 pounds of R-410A (a 50:50 blend of HFC-32 and HFC-125) were recovered and recycled from refrigeration equipment that was serviced. Meanwhile, 291 pounds of R-22 and 34 pounds of R-410A leaked from refrigeration and air conditioning equipment on-site. These leaks were subsequently reported as emissions in the Annual Emissions Statement transmitted to NYSDEC.

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. Halon recovered from excessed systems is shipped to the Department of Defense Ozone Depleting Substances Reserve in accordance with the Class I Ozone Depleting Substances Disposition Guidelines prepared by the DOE Office of Environmental Policy and Guidance. There were no discharges of Halon 1211 from the one remaining fixed fire suppression system on-site. Plans are being made to have this system removed by the end of 2024.

3.5.2 Hazardous Air Pollutants

In 1970, the CAA established standards to protect the general public from hazardous air pollutants that may lead to death or an increase in irreversible or incapacitating illnesses. The NESHAPs program was established in 1977 and the governing regulations were updated significantly in 1990. EPA developed NESHAPs to limit the emission of air pollutants. Since 1990, EPA has modified the list through rulemaking to include 187 hazardous air pollutants. The 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

Based on the Laboratory's periodic review of Maximum Available Control Technology (MACT) standards, it was determined that 40 CFR 63 Subpart GGGGG NESHAPs: Site Remediation require the Lab's Ground-water Protection Group to document the process it uses to prove that sum total of hazardous air pollutants removed by Laboratory groundwater treatment systems is less than 1 megagram (2,204.62 pounds) annually.

3.5.2.2 Asbestos

In 2023, the Laboratory notified the EPA Region II office regarding the removal of materials containing asbestos. During the year, 51,190 pounds of both scheduled and non-scheduled friable asbestos from maintenance operations materials and building demolition preparation (e.g., pipe insulation, sheetrock, popcorn ceiling, transite board, floor tiles, water main pipes) were removed and disposed of according to EPA requirements.

3.5.2.3 Radioactive Airborne Emissions

Minor and major sources of radiological airborne emissions from BNL's facilities and activities are evaluated to ensure that they do not impact the environment, on-site workers, or people residing at or near the Laboratory. A full description of radiological emissions monitoring conducted in 2023 is provided in Chapter 4.

BNL transmitted all data pertaining to radioactive air emissions and dose calculations to EPA in fulfillment of its annual reporting requirement. As in past years, the maximum off-site dose due to airborne radioactive emissions from the Laboratory continued to be below the 10 mrem (100 μ Sv) annual dose limit specified in 40 CFR 61 Subpart H (see Chapters 4 and 8 for more information on the estimated air dose). Using EPA modeling software, the dose to the maximally exposed off-site individual resulting from BNL's airborne emissions in 2023 was 2.92 mrem (29.2 μ Sv).

3.6 Clean Water Act (CWA)

The disposal of wastewater generated by Laboratory operations is regulated under the CWA as implemented by NYSDEC and under DOE Order 458.1 Chg 4 (LtdChg), 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 BNL that regulates wastewater effluents. The permit specifies monitoring requirements and effluent limits for nine of 13 outfalls, as described below. See Figure 5-3 in Chapter 5 for the locations of the following BNL outfalls:

- Outfall 001 is used to discharge treated effluent from the STP to groundwater recharge basins.
- 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. Because only stormwater or once-through cooling water is discharged to Outfalls 003, 011, and 012, NYSDEC imposes no monitoring requirements for these discharges.
- 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., cesspools) that receive predominantly sanitary waste and steam- and air-compressor condensate discharges. NYSDEC does not require monitoring of these disposal systems.

Each month, the Laboratory prepares Discharge Monitoring Reports (DMRs) that describe monitoring results, evaluate compliance with permit limitations, and identify corrective measures taken to address permit excursions. These reports are submitted electronically to EPA, NYSDEC central and regional offices, and SCDHS through a Network DMR (NetDMR) system. Details of the monitoring program conducted for the groundwater treatment systems where SPDES equivalency permits are in effect are provided in the Site Environmental Report (SER) Volume II, Groundwater Status Report. Evaluation of the current effluent quality shows it to consistently



meet groundwater effluent standards, and in most cases, ambient water quality standards for surface water. Details on monitoring results, evaluation of compliance with permit limits, and description of any corrective actions taken to address permit excursions are provided in the following sections.

3.6.1 Sewage Treatment Plant (STP)

Sanitary and process wastewater generated by BNL operations is conveyed to the STP for processing before discharge to groundwater recharge basins. The STP provides tertiary treatment of the wastewater and includes the following processes: settling/sedimentation, biological reduction of organic matter and nitrogen, and final filtration. Chapter 5 provides a detailed description of the treatment process.

A summary of SPDES monitoring results for the STP discharge at Outfall 001 is provided in Table 3-3, along with relevant SPDES permit limits. The Laboratory monitors the STP discharge for more than 100 parameters monthly and more than 200 parameters quarterly. BNL was 100 percent compliant with effluent limits in 2023.

Analyte	Low	High Beport	Min. Monitoring.	SPDFS Limit	Fxceedances	% Compliance*
pH (SU)	6.5	8.1	Continuous Recorder	Min 5.8, Max. 8.5	0	100
Solids, Total Dissolved (mg/L)	356	448	Monthly	1000	0	100
Total nitrogen (mg/L)	4.2	9.1	Twice Monthly	10	0	100
Total phosphorus (mg/L)	0.62	1.12	Twice Monthly	NA	0	100
Cyanide (mg/L)	< 0.002	< 0.002	Twice Monthly	0.1	0	100
Copper (mg/L)	0.003	0.025	Twice Monthly	0.15	0	100
Iron (mg/L)	0.07	0.30	Twice Monthly	0.6	0	100
Lead (mg/L)	<0.001	0.001	Twice Monthly	0.025	0	100
Mercury (ng/L)	1.3	7	Twice Monthly	200	0	100
Methylene chloride (ug/L)	0.5	2	Twice Monthly	5	0	100
Nickel (mg/L)	< 0.002	0.05	Twice Monthly	0.1	0	100
Silver (mg/L)	< 0.001	< 0.001	Twice Monthly	0.015	0	100
Toluene (ug/L)	< 1	< 1	Twice Monthly	5	0	100
Zinc (mg/L)	0.02	0.08	Twice Monthly	2	0	100
1,1,1-trichloroethane (ug/L)	< 1	< 1	Twice Monthly	5	0	100
Max. Flow (MGD)	0.21	0.56	Continuous Recorder	2.3	0	100
Avg. Flow (MGD)	0.14	0.29	Continuous Recorder	NA	0	100
HEDP (mg/L)	<0.05	0.1	Monthly	0.5	0	100
Tolytriazole (mg/L)	< 0.05	<0.05	Monthly	0.05	0	100

Table 3-3. Analytic	al Results for V	Vastewater Disc	harges to Sewage	e Treatment Pla	nt Outfall 001.

Notes:

See Figure 5-3 for location of Outfall 001.

*% Compliance = total no. samples - total no. exceedances/total no. of

samples x 100

HEDP = 1-hydroxyethylidene diphosphonic acid

MGD = million gallons per day

NA = Not Applicable

SPDES = State Pollutant Discharge Elimination System

SU = standard unit



Figures 3-1 through 3-7 plot the five-year trends for monthly concentrations of copper, iron, lead, mercury, nickel, silver, and zinc in the STP discharge.

Figure 3-1.

Maximum Concentrations of Copper Discharged From the BNL Sewage Treatment Plant, 2018–2023.



Figure 3-2.

Maximum Concentrations of Iron Discharged From the BNL Sewage Treatment Plant, 2018–2023.















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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)	z	CR	CR	CR	CR	СВ	CR	12	12			
	Min.	0.16	0.002	0.09	0.17	0.01	0.04	0.003	0.002	AN	NA	NA
	Мах.	0.53	0.04	0.47	0.36	0.14	0.08	0.089	0.078	NA		
pH (SU)	Min.	7.1	7.3	6.9	7.3	7.3	7.4	6.9	7.0	AN	c	C T
	Мах.	8.5	8.6	8.5	8.8	8.7	8.9	7.9	8.2	8.5, 9.0 (a)	D	001
Oil and Grease (mg/L)	z	13	12	12	12	13	NR	12	12			
	Min.	< 1.3	< 1.3	< 1.3	< 1.3	< 1.3	NR	< 1.3	< 1.3	AN	-	66
	Мах.	2.9	2.8	2.6	3.1	163.0	NR	4.8	2.5	15		
Copper (mg/L)	z	NR	NR	4	RN	RN	RN	NR	4			
	Min.	NR	NR	0.001(T)	NR	NR	NR	NR	0.002	AN	0	100
	Мах.	NR	NR	0.003 (T)	NR	NR	RN	ЯN	0.004	1.0		
Aluminum (mg/L)	z	თ	NR	RN	RN	NR	ЯN	4	4			
	Min.	< 0.07 (T)	NR	RN	NR	NR	RN	< 0.07 (D)	< 0.07 (D)	NA	0	100
	Мах.	0.13 (T)	NR	RN	NR	NR	RN	< 0.07 (D)	< 0.07 (D)	2.0		
Lead, Dissolved (mg/L)	z	NR	RN	RN	RN	RN	RN	ЯN	4			
	Min.	NR	NR	RN	ЯN	NR	ЯN	ЯN	<0.0005	ΝA	0	100
	Мах.	NR	NR	RN	NR	NR	RN	ЯN	<0.0005	0.05		
Vanadium, Dissolved (mg/L)	z	NR	NR	RN	RN	NR	NR	NR	4			
	Min.	NR	RN	ЯN	RN	NR	RN	NR	0.003	AA	NA	NA
	Мах.	NR	NR	RN	RN	NR	RN	NR	0.004	NPL		
Chloroform (µg/L)	z	5	RN	RN	ВN	RN	RN	NR	NR			
	Min.	ر ۷	NR	RN	NR	NR	NR	NR	NR	AA	0	100
	Мах.	۰ ۲	NR	NR	NR	NR	NR	NR	NR	7		
											(continue	ed on next page)

CHAPTER 3: COMPLIANCE STATUS

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Analyte		Outfall 002	Outfall 002B	Outfall 005	Outfall 006A	Outfall 006B	Outfall 007	Outfall 008	Outfall 010	SPDES Limit	No. of Exceedances	% Compliance*
Bromodichloromethane	z	£	RN	NR	NR	NR	RN	RN	NR			
(HB/L)	Min.	v	RN	NR	NR	NR	RN	RN	RN	NA	0	100
	Max.	v	RN	NR	NR	NR	RN	RN	RN	50		
1,1,1-trichloroethane (µg/L)	z	Q	RN	NR	NR	NR	RN	<u>6</u>	RN			
	Min.	v	RN	NR	NR	NR	RN	۲- ۷	RN	AN	0	100
	Max.	v	RN	NR	NR	NR	RN	۲- ۷	RN	5		
1,1-dicloroethane (µg/L)	z	NR	RN	NR	NR	NR	RN	12	RN			
	Min.	NR	RN	NR	NR	NR	RN	۲- ۷	RN	AN	0	100
	Мах.	NR	RN	NR	NR	NR	RN	۲- ۷	RN	5		
Hydroxyethylidene-	z	4	4	4	4	4	RN	RN	RN			
מימיוטארוטווע מכות (ווופ/ ב)	Min.	<0.05	<0.05	<0.05	<0.05	<0.05	RN	RN	ЯN	NA	0	100
	Мах.	<0.05	<0.05	<0.05	<0.05	<0.05	RN	RN	ЯN	0.5		
Tolyltriazole (mg/L)	z	4	4	4	4	4	RN	RN	RN			
	Min.	<0.05	<0.05	<0.05	<0.05	<0.05	NR	NR	NR	NA	0	100
	Мах.	<0.05	<0.05	<0.05	<0.05	<0.05	NR	NR	NR	0.2		
Votes:												

Table 3-4. Analytical Results for Wastewater Discharges to Outfalls 002, 005 - 008, and 010 (concluded).

(a) pH limit is 8.5 for Outfalls 005, 008, and 010; pH limit is 9.0 for Outfalls 002, 002B, 006A, 006B, and 007 CR = continuous recorder *% Compliance = total no. samples - total no. exceedances/total no. of There are no monitoring requirements for Outfalls 009, 011, and 012. See Figure 5-3 for location of outfalls. samples x 100

D = dissolved

MGD = million gallons per day

N = number of samples NA = not applicable NPL = no permit limit; monitoring only NR = analysis not required SPDES = State Pollutant Discharge Elimination System SU = standard unit T = total recoverable Max. = maximum value Min. = minimum value



3.6.2 Recharge Basins and Stormwater

Water discharged to Outfalls 002 through 008 and Outfalls 010 through 012 recharges to groundwater. 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.

A sample collected on January 3, 2023, from Outfall 006B (HT-E) for routine monthly compliance analysis exhibited an oil and grease concentration of 163 mg/L, which is above the permit limit of 15 mg/L. The cause of this excursion was due to the improper disposal of oil-containing equipment (e.g., capacitors, resistors, vacuum pumps, heat exchangers) in a scrap metal dumpster during housekeeping activities. Due to a lack of familiarity with the equipment, personnel were unaware that these items contained oil, leading to oil leakage and subsequent environmental contamination. The placement of the scrap metal dumpster near an adjacent storm drain allowed the spilled oil to enter this permitted storm water recharge basin. Cleanup efforts were successful in addressing this release and follow-up field inspections and sampling of the outfall confirmed oil and grease was non-detect. In addition, a Lessons Learned was published and shared across the DOE Complex and personnel typically involved with scrap metal disposal activities were trained on proper waste disposal practices.

3.7 Safe Drinking Water Act (SDWA)

The extraction and distribution of drinking water are 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 locally by SCDHS. Because BNL provides potable water to more than 25 full-time residents, it is subject to the same requirements as a municipal water supplier. Monitoring requirements are prescribed annually by SCDHS, and a Potable Water Sampling and Analysis Plan (Bruno, 2023) is prepared by the Laboratory to comply with these requirements.

3.7.1 Potable Water

The Laboratory has six water supply wells for on-site distribution of potable water, four of which were active during 2023. 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 yearly. Tables 3-5, 3-6 and 3-7 provide potable water supply monitoring data. BNL's drinking water and the supply and distribution system were in full compliance with all applicable county, state, and federal regulations regarding drinking water quality, monitoring, operations, and reporting in 2023.

In 2013, the EPA required large water providers to start testing for six common Per- and Poly- fluoroalkyl Substances (PFAS) chemicals under the third Unregulated Contaminant Monitoring Rule (UCMR 3). As a medium-size system, BNL was not required to participate in this testing program. In 2017, SCDHS began routine testing of all water supply systems for PFAS,





including BNL. PFAS chemicals were detected in three of BNL's active water supply wells. In these initial tests, Perfluorooctanoic Acid (PFOA) and Perfluorooctanesulfonic Acid (PFOS) were detected at concentrations below the 2016 EPA Health Advisory Level of 70 ng/L (ppt) that was established specifically for the combined concentration of these two chemicals. Following repeated confirmed detections of PFAS in the supply wells, the Lab started routine quarterly testing for PFAS in 2018. The results for 2023 are provided in Table 3-7.

In 2020, New York State established enforceable drinking water standards for PFOS and PFOA at concentrations of 10 ng/L (ppt). The other four PFAS chemicals would continue to be regulated under the current New York State limit of 50 µg/L (ppb) for unregulated contaminants. In May 2020, Granular Activated Carbon (GAC) filters were restored on Well 11 to remove PFOS and low levels of the other PFAS chemicals that may be present. In May 2021, GAC filters were restored on Well 10. Construction for the restoration of Well 12 and its GAC filters was completed in 2022.

To ensure that consumers are informed about the quality of Laboratory-supplied potable water, BNL publishes a Consumer Confidence Report (CCR) in May of each year, a deadline stipulated by the SDWA. This report provides information regarding source water supply system, the analytical tests conducted and the detected contaminants which are then compared to federal drinking water standards. The CCR also describes the measures the Laboratory takes to protect its water source and limit consumer exposure to contaminants. The CCR is distributed to all BNL employees and on-site residents, either in paper form or electronically at http://www.bnl.gov/water/.

	Well	Well	Well	Well	Potable Distribution	NYS
Compound	No. 7	No. 10	No. 11	No. 12	Sample	DWS
Water Quality Indicators						
Ammonia (mg/L)	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	SNS
Chlorides (mg/L)	64.1	75	66.9	49.9	77.5	250
Color (units)	<5	<5	<5	<5	6	15
Conductivity (mmhos/cm)	289	420	394	339	456	SNS
Cyanide (mg/L)	< 10	< 10	< 10	< 10	< 10	SNS
MBAS (mg/L)	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	SNS
Nitrates (mg/L)	0.37	0.56	0.57	0.46	0.46	10
Nitrites (mg/L)	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	1
Odor (units)	0	0	0	0	0	3
pH (Standard Units)	6.4	8.7	8.7	8.6	8.8	SNS
Sulfates (mg/L)	9.6	9.9	10.4	11.6	13.8	250
Total coliform	ND	ND	ND	1*	1*	Negative
Metals						
Antimony (mg/L)	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	6
Arsenic (mg/L)	1.1	<1.0	<1.0	< 1.0	< 1.0	50
Barium (mg/L)	0.04	0.052	0.05	0.044	0.041	2
Beryllium (mg/L)	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	4
Cadmium (mg/L)	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	5
Chromium (mg/L)	< 0.007	< 0.007	< 0.007	< 0.007	< 0.007	0.1
Copper (mg/L)	0.0027	0.003	0.0043	<0.002	0.015	1.3
Fluoride (mg/L)	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	2.2
Hexavalent Chromium (mg/L)	NR	<0.02	<0.02	<0.02	<0.02	0.05

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

(continued on next page)



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

	Well	Well	Well	Well	Potable Distribution	NYS
Compound	No. 7	NO. 10	No. 11	No. 12	Sample	DWS
Metals (continued)					1	
Iron (mg/L)	3.1**	<0.02	<0.02	<0.02	0.1	0.3
Lead (mg/L)	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	15
Manganese (mg/L)	0.079	<0.01	<0.01	< 0.01	< 0.01	0.3
Mercury (mg/L)	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	2
Nickel (mg/L)	0.004	0.0005	0.0019	<0.0005	<0.0005	SNS
Selenium (mg/L)	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	50
Sodium (mg/L)	40.6	49.6	44.2	31.5	37.6	SNS
Silver (mg/L)	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	100
Thallium (mg/L)	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	2
Zinc (mg/L)	<0.02	<0.02	<0.02	<0.02	<0.02	5
Radioactivity						
Cesium-137 (pCi/L)	<7.26	<7.03	<7.75	<9.2	NR	200
Gross alpha activity (pCi/L)	<1.78	<1.85	<1.82	<1.71	NR	15
Gross beta activity (pCi/L)	<2.53	2.21 ± 1.27	2.01 ±1.13	<1.95	NR	(a)
Strontium-90 (pCi/L)	<0.8	<0.8	<0.78	<0.78	NR	8
Tritium (pCi/L)	<369	<344	<387	<372	NR	20,000
Other						
Alkalinity (mg/L)	15.6	37.6	30	16.8	65.3	SNS
Asbestos (MFL)	NR	NR	NR	NR	< 0.05	7
Calcium (mg/L)	7.4	14.4	10	8.2	22.6	SNS
HAA5 (mg/L)	NR	NR	NR	NR	<0.016	0.06***
Residual chlorine - MRDL (mg/L)	NR	NR	NR	NR	1.3	4
Tolytriazole (mg/L)	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.05
TTHM (mg/L)	NR	NR	NR	NR	0.012	0.08***

Notes:

See Figure 7-1 for well locations.

HAA5 = five haloacetic acids

MBAS = methylene blue active substances

MRDL = maximum residual disinfectant level MFL = Million Fibers per Liter

ND = not detected NR = analysis not required

NS = not sampled

NYS DWS = New York State Drinking Water Standard

SNS = drinking water standard not specified

TTHM = total trihalomethanes

*Positive sample was not confirmed with additional sampling. No violation occurred.

** Water from this well is treated at the Water Treatment Plant for color and iron reduction prior to 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. Gross beta activity does not identify specific radionuclides; therefore, a dose equivalent can not be calculated. No specific nuclides were detected; therefore, compliance with the requirement is demonstrated.



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

	WTP Effluent	Well No. 7	Well No. 10	Well No. 11	Well No. 12	NYS DWS
Compound			µg	/L		
Tert-butylbenzene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	5
1,2,4-trimethylbenzene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	5
sec-butylbenzene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	5
4-Isopropyltoluene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	5
n-butylbenzene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	5
Chloroform	< 0.5	< 0.5	1.6	0.8	1.0	50
Bromodichloromethane	1.0	< 0.5	1.3	< 0.5	< 0.5	50
Dibromochloromethane	2.8	< 0.5	3.7	< 0.5	< 0.5	50
Bromoform	2.7	< 0.5	6.1	0.52	< 0.5	50
Methyl tert-butyl ether	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	50
Toxaphene	< 1	< 1	< 1	< 1	< 1	3
Total PCB's	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	0.5
2,4,5,-TP (Silvex)	< 0.13	< 0.13	< 0.13	< 0.13	< 0.13	10
Dinoseb	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	50
Dalapon	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	50
Pichloram	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	50
Dicamba	<1	<1	<1	<1	<1	50
Pentachlorophenol	< 0.04	<0.04	< 0.04	< 0.04	< 0.04	1
Hexachlorocyclopentadiene	< 0.1	0.02	< 0.1	< 0.1	< 0.1	5
Bis(2-ethylhexyl)Phthalate	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	50
Bis(2-ethylhexyl)Adipate	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	50
Hexachlorobenzene	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	5
Benzo(A)Pyrene	0.03	< 0.02	< 0.02	< 0.02	< 0.02	50
Aldicarb Sulfone	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8	SNS
Aldicarb Sulfoxide	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	SNS
Aldicarb	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	SNS
Oxamyl	< 1	< 1	< 1	< 1	< 1	50
3-Hydroxycarbofuran	<1	< 1	< 1	< 1	< 1	50
Carbofuran	< 0.9	< 0.9	< 0.9	< 0.9	< 0.9	40
Carbaryl	< 1	< 1	< 1	< 1	< 1	50
Methomyl	< 1	< 1	< 1	< 1	< 1	50
Glyphosate	< 6	< 6	< 6	6.2	< 6	50
Diquat	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	50
1,2-dibromoethane (EDB)	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.05
1,2-dibromo-3-chloropropane	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.2
Lindane	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	0.2
Heptachlor	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	0.4
Aldrin	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	5
Heptachlor Epoxide	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	0.2
Dieldrin	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	5

(continued on next page)



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

	WTP Effluent	Well No. 7	Well No. 10	Well No. 11	Well No. 12	NYS DWS
Compound			µg	/L		· · · · · · · · · · · ·
Endrin	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.2
Methoxychlor	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	40
Chlordane	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	2
2,4,-D	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	50
Alachlor	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	2
Simazine	< 0.07	< 0.07	< 0.07	< 0.07	< 0.07	50
Atrazine	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	3
Metolachlor	< 1	< 1	< 1	< 1	< 1	50
Metribuzin	< 0.5	< 0.15	< 0.15	< 0.15	< 0.15	50
Butachlor	< 1	< 1	< 1	< 1	< 1	50
Endothall	< 9	< 9	< 9	< 9	< 9	100
Propachlor	< 1	< 1	< 1	< 1	< 1	50
Freon-113	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	50
1,4-Dioxane	0.11	0.15	0.06	0.06	0.03	1

Notes:

See Figure 7-1 for well locations.

For compliance determination with New York State Department of Health standards, potable water samples were analyzed quarterly for Principal Organic Compounds and annually for other organics by Pace Labs, a New York State-certified contractor laboratory.

The minimum detection limits for principal organic compound analytes are 0.5 mg/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. SNS = drinking water standard not specified

NYS DWS = New York State Drinking Water Standard WTP = Water Treatment Plant



Table 3-7. Potable Water Wells and Potable Distribution System: Perflored	ourinate	d Comp	ounds.			
	Well No. 7	Well No. 10	Well No. 11	Well No. 12	Water Treatment Facility	NYS DWS
Compound				μg/L —		
Perfluorooctanesulfonate (PFOS)	1.88	<1.96	<1.94	<1.77	1.54	10
Perfluoroundecanoic acid (PFUdA)	<1.86	<1.96	<1.94	<1.77	<1.78	NS
Perfluoropentanoic acid (PFPeA)	1.31	<1.96	4.28	<1.77	1.21	NS
Perfluoropentanesulfonate (PFPeS)	<1.74	<1.84	<1.82	<1.66	<1.67	NS
Fluorotelomer sulfonate 6:2 (6:2 FTS)	<13.9	<14.7	<14.5	<13.3	<13.3	NS
Perfluorohexanoic acid (PFHxA)	1.21	<1.96	3.11	<1.77	1.17	NS
Perfluorododecanoic acid (PFDoA)	<1.86	<1.96	<1.94	<1.77	<1.78	NS
Perfluorooctanoic acid (PFOA)	2.1	<1.96	1	<1.77	1.52	10
Perfluorodecanoic acid (PFDA)	<1.86	<1.96	<1.94	<1.77	<1.78	NS
Perfluorohexanesulfonate (PFHxS)	<1.69	<1.78	4.75	<1.61	1.62	NS
Perfluorobutyric acid (PFBA)	1.09	118	52.6	1.85	16.3	NS
Perfluorobutanesulfonate (PFBS)	<1.65	<1.74	1.06	<1.58	<1.58	NS
Perfluoroheptanoic acid (PFHpA)	0.72	<1.96	0.68	<1.77	0.81	NS
Perfluoroheptanesulfonate (PFHpS)	<1.76	<1.86	<1.84	<1.68	<1.69	NS
Perfluorononanoic acid (PFNA)	<1.86	<1.96	<1.94	<1.77	<1.78	NS
1H, 1H, 2H, 2H-Perfluorodecane sulfonic acid (8:2 FTS)	<3.56	<3.76	<3.72	<3.40	<3.41	NS
Fluorotelomer sulfonate 4:2 (4:2 FTS)	<3.49	<3.68	<3.65	<3.33	<3.34	NS
Hexafluoropropyleneoxide dimer acid (HFPO-DA)(Gen-X)	<1.86	<1.96	<1.94	<1.77	<1.78	NS
Perfluoro(2-ethoxyethane)sulfonic acid (PFEESA)	<1.86	<1.96	<1.94	<1.77	<1.78	NS
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11-Cl-PF3OUdS)	<1.75	<1.84	<1.83	<1.67	<1.67	NS
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9-CI-PF3ONS)	<1.73	<1.82	<1.81	<1.65	<1.66	NS
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	<3.71	<3.91	<3.88	<3.54	<3.55	NS
Perfluoro-3-methoxypropanoic acid (PFMPA)	<3.71	<3.91	<3.88	<3.54	<3.55	NS
Perfluoro-4-methoxybutanoic acid (PFMBA)	<3.71	<3.91	<3.88	<3.54	<3.55	NS
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	<1.86	<1.96	<1.94	<1.77	<1.78	NS

Table	3-7.	Potable	Water	Wells a	and Potable	Distribution	System.	Perflourinated	Compounds
i u o i o	• • •	1 010010	vvalor	110 u		Diotribution			Compoundo

Notes:

NS - No Standard. NYS currently does not have a drinking water standard for these

compounds. Compounds are subjected to the 50 ug/L limit for nonregulated contaminants.

Results from wells 10, 11, and 12 are post Granulated Active Carbon treatment.



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 cross-connections between the potable water supply and facility piping systems. 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 accidental introduction into the domestic water system, especially under low-pressure conditions. In addition, secondary cross-connection controls at the point of use are recommended to protect users within a specific facility from hazards that may be posed by intrafacility operations.

During 2023, the Laboratory inspected 284 cross-connection control devices, including primary devices installed at interfaces to the potable water main and secondary control devices at the point of use. If a problem with a cross-connection device is encountered during testing, the device is repaired and re-tested to ensure proper function. Copies of the cross-connection device test reports are filed with SCDHS each year.

3.7.3 Underground Injection Control

Underground Injection Control (UIC) wells are regulated under the SDWA. At the Laboratory, 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 has not adopted UIC regulatory requirements (Note: New York State regulates the discharges of pollutants to cesspools under the SPDES program). Under EPA's UIC program, all Class V injection wells are authorized by rule and must be included in an inventory maintained with the agency.

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 these UICs are also authorized by rule rather than by permit. Under the authorized by rule requirements, a separate inventory is maintained for these treatment facilities, and is periodically updated whenever a new device is added or closed.

No UIC installations occurred in 2023. BNL's total UIC inventory at the end of 2023 was 120.

3.8 Preventing and Reporting Spills

Federal, state, and local regulations are in place to 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 releases that do occur. BNL's compliance with these regulations is further described in the following sections.

3.8.1 Preventing Oil Pollution and Spills

As required by the Oil Pollution Act, BNL maintains a Spill Prevention Control and Countermeasures (SPCC) Plan as a condition of its license to store petroleum fuel (Bruno, 2021). The purpose of this plan is to provide information regarding release prevention measures, the design of storage facilities, and maps detailing storage facility locations. The plan also outlines mitigating and remedial actions that would be taken in the event of a major spill.

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BNL's SPCC plan is filed with NYSDEC, EPA, and DOE, and must be updated every five years. BNL remained in full compliance with SPCC requirements in 2023.

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 require that facilities report inventories and releases of certain chemicals that exceed specific release thresholds. Community Right-to-Know requirements are codified under 40 CFR Parts 355, 370, and 372. Table 3-8 summarizes the applicability of the regulations to BNL.

The Laboratory complied with these requirements through the submittal of Tier II and Tier III Reports required under EPCRA Sections 302, 303, 311, 312, and 313. In fulfillment of the Tier II requirements, BNL submitted an inventory of 33 on-site chemicals (with thresholds greater than 10,000 pounds or 500 pounds for acutely toxic materials) via E-Plan, the New York State-approved computer-based submittal program.

Applicability of EPCR	A 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 []

Table 3-8. Applicability of EPCRA to BNL.

Notes: EHS: Extremely Hazardous Substance SDS: Safety Data Sheet.

TRI: Toxic Release Inventory

To satisfy the requirements of the Tier III submittal, the Laboratory submitted its data via the EPA-approved TRI-ME computer-based submittal program. During 2023, BNL reported releases of lead (about 45,000 pounds), mercury (about four pounds), polychlorinated biphenyls (PCBs) (about two pounds), benzo(g,h,i)perylene (less than one pound), polycyclic aromatic compounds (less than one pound), and friable asbestos (about 51,000 pounds). Releases of lead, PCBs, mercury, and asbestos were 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 by-products of the combustion of fuel oils. In 2023, there were no releases of extremely hazardous substances reportable under Part 304.

3.8.3 Spills and Releases

When a spill of hazardous material occurs, Laboratory and contractor personnel are required to immediately notify the BNL Fire Rescue Group, whose members are trained to respond to such releases. Fire Rescue's initial response is to contain and control any release and to notify additional response personnel (e.g., 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 affecting surface water is also reported to the EPA National Response Center. In addition, a release of more than five 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 spills is conducted, as necessary, to prevent impacts to the environment, minimize human health exposures, and restore the site.



BNL Spill No. and Date	Material/ Quantity	ORPS Report	Source/Cause and Corrective Actions	
23-04 (1/27/23)	Dielectric oil/ 1 quart	No	An oil sheen observed in a stormwater catch basin near Building 914 was caused by an electrical component (coaxial resistor) in a scrap metal container that was leaking dielectric oil. The leaking equipment was removed from the dumpster, the oil sheen/oily water was conveyed out of the catch basin, an oil absorbing boom sock was placed into the basin to absorb any remaining oil, and the oily water within the dumpster was also removed. The dumpster was relocated, the oil on the asphalt was removed with an absorbent and the entire storm drain system was flushed with potable water while absorbent pads and spill pillows were utilized to capture the residual oil sheens. Roughly 30 gallons of oily liquid from the catch basin was pumped out and transferred to a 55-gallon drum. Solid oil-contaminated spill pads were placed into a thick plastic bag, and used speedy dry was placed in a 5-gallon pail. All liquid and solid Industrial Wastes were transported for off-site disposal through Waste Management.	
23-05 (2/22/23)	Gasoline / 0.5 gallons	No	An employee-owned vehicle leaked gasoline onto asphalt and soil due to over-pressurization of the tank caused by a non-venting tank cap. The vehicle was re-positioned and Speedi-dri absorbent was applied to the pavement. A 5-gallon pail was used to contain the used absorbent and a small amount of soil. This waste was placed inside an existing drum used for past oil spills. The drum was transferred to the on-site Waste Management Facility for proper, off-site disposal.	
23-07 (4/6/23)	Mineral Oil / 25 gallons	No	When a water evaporator in Building 945 was activated, mineral oil was observed flowing from behind a panel on the front of the unit. Initially, the oil was captured in a secondary containment berm that the evaporator is located within. Oil absorbent pads were used to soak up the oil by BNL staff. The cause of the leak was a failed fitting. The absorbent material used to clean the containment area was collected in bags, and placed within a waste storage shed for the facility and then transferred to the Waste Management Facility for proper, off-site disposal.	
23-10 (5/16/23)	Compressor Oil / 25 gallons	No	BNL Staff observed an oil leak on a compressor in Building 902W, room W3A. The apparent cause was a defective ferrule on a fitting for a 1/8-inch diameter control valve tube. Spill responders applied oil- absorbents and pads to the floor to contain the leak. The spilled oil remained in and around the compressor and did not drain into any floor drains or travel to the exterior of the building. All oil-contaminated spill response equipment was placed into 55-gallon metal drums and was picked up by Waste Management for proper off-site disposal. The defective fitting was replaced at a later date.	
23-14 (6/28/23)	Hydraulic fluid / 1 pint	No	BNL Tower Line Staff observed a hydraulic oil leak associated with a Power Takeoff Switch on a Tower line truck resulting in a small stain (approximately 1.5" diameter) on the soil. The oil-stained soil was shoveled into a 5-gallon pail. The soil was consolidated with similar waste debris and was initially staged at Building 339. The drum was transferred to Waste Management for off-site disposal.	
23-15 (7/7/23)	Hydraulic Fluid / 2 pints	No	During a crane training exercise for Heavy Equipment Machine Operators (HEMO), hydraulic oil from a BNL crane leaked onto soil when a hydraulic return line failed. Multiple oil absorbent pads were placed beneath the crane to capture hydraulic fluid dripping from the underside of the crane. BNL staff shoveled the contaminated gravel and soil beneath the crane into a 5-gallon pail. This pail was transferred to the Building 630 Waste Accumulation Area and was transferred to Waste Management for proper off-site disposal.	
23-16 (7/7/23)	Hydraulic Fluid / 2 gallons	No	During a roof replacement project at Building 599, a contractor utilizing a forklift for removal of roof ballast experienced a hydraulic line leak from a hose. In order to minimize the amount of fluid spilled into the building, the forklift was backed up about 35 yards on a grassy surface resulting in a spill to the soil. BNL staff utilized a small skid-steer to scoop up the stained grass and soil and placed it into the subcontractor's twenty cubic yard roll off container that was previously used for roof ballast removals. The roll off container was covered with tarps/plastic. BNL staff assisted the contractor with waste sampling and disposal arrangements and the soil was ultimately transported off-site for recycling/soil washing.	
23-18 (11/21/23)	Hydraulic Fluid / 1.5 gallons	No	During a routine inspection of the elevator pit at Building 725 (North elevator), it was observed by the HEMO Inspectors that the catch can used for capturing overflow oil from the jack piston was inverted. This caused the contained elevator oil to spill onto absorbent pads placed inside the container's containment pan. Apparently, some of the oil from the pads seeped into the space between the outer casing and the jack piston. This space intersects with groundwater at approximately 13 feet below elevator pit grade. Specially designed oil-spill absorbent pigs were lowered into the space to capture the spilled oil. An estimated 1.5 gallons were released as calculated by the loss of oil in the elevator's reservoir tank and the amount of oil soaked up in the absorbent pads placed inside the space. Waste from this spill was bagged and brought to the building 630 90-Day Haz Waste Accumulation Area and properly disposed of at an off-site facility.	



There were eighteen spills in 2023 and eight of those spills met regulatory agency reporting criteria. The remaining spills were small-volume releases either to containment areas or to other impermeable surfaces that did not exceed a reportable quantity. Table 3-9 summarizes each of the eight reportable events, including a description of the cause and corrective actions taken. Figure 3-8 is a five-year trend of spills that have occurred at BNL. The increase in the number of spills over the last two years is resulting from increased site activity associated with infrastructure upgrades and new construction.

There were no long-term effects from these releases and no significant impact on the environment. In all instances, any recoverable material was removed, spill absorbents were used to remove the residual product, and all materials were collected and containerized for off-site disposal. For releases to soil, contaminated soil was removed to the satisfaction of the State inspector and containerized for off-site disposal.



Figure 3-8. Spills Trend 2019-2023.

3.8.4 Major Petroleum Facility (MPF) License

The storage and transfer of 1.9 million gallons of fuel oil (principally No. 6 oil and No. 2 oil) subjects the Laboratory to MPF licensing by NYSDEC. The fuel oil used at the CSF to produce high-pressure steam to heat and cool BNL facilities is stored in five tanks with capacities ranging from 300,000 to 600,000 gallons. The remaining storage facilities at BNL have capacities that range from 100 to 10,000 gallons and are located throughout the site where there is a need for building heat, emergency power, fuel, or other miscellaneous petroleum needs (e.g., motor oil, used oil, lube oil, biodiesel).

There are currently 58 active petroleum storage facilities listed on the license. BNL remained in full compliance with MPF license requirements in 2023, which includes monitoring groundwater near five active above-ground storage tanks at the MPF. The license also requires the Laboratory to inspect the storage facilities monthly, test the tank leak detection systems, and ensure high-level monitoring and secondary containment is functional. Tank integrity is also checked periodically. Groundwater monitoring consists of monthly checks for the presence of floating products and twice-yearly analyses for volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs). In 2023, no VOCs or floating products attributable to MPF activities were detected above detectable limits. Low level (estimated) concentrations of several SVOCs (e.g., Bis(2-ethylhexyl) phthalate, Di-n-butyl phthalate, and Phenol) were reported for samples collected from the upgradient well and all seven



downgradient wells. Bis(2-ethylhexyl) phthalate and Phenol were found just above NYS Ambient Water Quality Standards. See SER Volume II, Groundwater Status Report, for additional information on groundwater monitoring results in areas where bulk petroleum products are being stored. There were no EPA or NYSDEC bulk storage tank inspections in 2023.

3.8.5 Chemical Bulk Storage (CBS)

Title 6 of the Official Compilation of the Codes, Rules, and Regulations of the State of New York (NYCRR) Part 596 requires that all aboveground tanks larger than 185 gallons and all underground tanks that store specific chemicals are registered with NYSDEC. The Laboratory holds a Hazardous Substance Bulk Storage Registration Certificate for six tanks that store treatment chemicals for potable water (sodium hydroxide and sodium hypo-chlorite). The tanks range in capacity from 200 to 1,000 gallons. There were no NYSDEC CBS Facility inspections in 2023.

3.8.6 County Storage Requirements

Article 12 of the Suffolk County Sanitary Code (SCSC) regulates the storage and handling of 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, and 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.

In April 2010, due to a directive from NYSDEC asserting its sole jurisdiction over petroleum storage at Major Oil Storage Facilities, SCDHS notified BNL that it will cease permitting activities (e.g., review/approval for new construction and modifications, issuance of operating permits, and registration requirement) for all petroleum bulk storage facilities. In 2011, the Laboratory received further information that indicated SCDHS had ceased applying Article 12 requirements to both petroleum and chemical storage at BNL regardless of whether the storage is regulated by NYSDEC. Currently, there are approximately 122 active storage facilities that are not regulated by NYSDEC that would normally fall under SCSC Article 12 jurisdiction. This includes storage of wastewater and chemicals, as well as storage facilities used to support BNL research.

To ensure that storage of chemicals and petroleum continues to meet Article 12 requirements, BNL continues to abide by the original 1987 agreement with Suffolk County and will maintain conformance with applicable requirements of Article 12. These requirements include design, operational, and closure requirements for current and future storage facilities. Although the Laboratory will no longer submit new design plans for SCDHS review and approval or continue to perform other administrative activities such as registration of exempt facilities and updates of shared databases, it will continue to inspect all storage facilities to ensure operational requirements of SCSC Article 12 are maintained.

3.9 Resource Conservation and Recovery Act (RCRA) Requirements

The RCRA regulates hazardous waste 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. Because the Laboratory may generate greater than 1,000 Kg (2,200 pounds) of hazardous waste in a month, it is considered a large quantity generator and has a RCRA permit to store hazardous wastes for up to one year before shipping the wastes off-site to licensed treatment and disposal facilities.

As noted in Chapter 2, BNL also has several satellite accumulation and 90-Day Hazardous Waste Accumulation Areas. Included with the hazardous wastes regulated under RCRA are mixed wastes which are typically generated in small quantities at BNL, though no mixed waste was generated during 2023. Mixed wastes are materials that are both hazardous (under RCRA guidelines) and radioactive.

In September 2023, the NYSDEC conducted a hazardous waste compliance evaluation inspection (CEI) at BNL to fulfill the statutory requirement under RCRA to annually inspect all federally owned and/or operated hazardous waste treatment, storage, and disposal facilities (TSDFs). The inspection involved the review of shipping manifests, the Waste Management Facility's Part 373 RCRA Permit, inspection and training records, and a visit to the NYSDEC Permitted TSDF and site 90-Day and Satellite Accumulation hazardous waste storage areas. A Notice of Violation (NOV) letter and report documenting the inspection was received from the NYSDEC on October 26, 2023, which indicated two violations pertaining to the management/labeling of fluorescent lamp universal wastes. Both violations were corrected thus satisfying the conditions of the NOV. Please see Table 3-10 for more details.

3.10 Polychlorinated Biphenyls (PCBs)

The storage, handling, and use of PCBs are regulated under the Toxic Substance and Control Act. Capacitors manufactured before 1979 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 three 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 all applicable PCB regulatory requirements during 2023 and disposed of 343 pounds of PCB-contaminated oil, debris, and other equipment comprised predominantly of lighting ballasts and small capacitors.

The Laboratory has aggressively approached reduction in its PCB inventory, reducing it by more than 99 percent since 1993. The only known regulated PCB-contaminated piece of electrical equipment remaining on-site is a one-of-a-kind klystron located in BNL's Chemistry Department.

3.11 Pesticides

The storage and application of pesticides (e.g., insecticides, rodenticides, herbicides, and algicides) are regulated under the Federal Insecticide, Fungicide, and Rodenticide Act and the NYSDEC Pesticide Regulations. BNL uses an Integrated Pest Management approach that was developed over a decade ago and was assessed in 2021 by a third-party (Cornell Cooperative). Pesticides are used at the Laboratory to control undesirable insects and mice and microbial growth 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 in research on greenhouses on-site and the Biology Field. Herbicide use is minimized wherever possible (e.g., through spot treatment of weeds). Pesticides are applied by BNL-employed, NYSDEC pesticide-certified applicators. On an infrequent basis and for special projects, an outside vendor who also possesses the required NYSDEC application licenses applies pesticides. Cooling towers are regularly treated by another vendor that has NYSDEC-licensed



pesticide applicators using NYSDEC approved biocides, corrosion inhibitors, and disinfectants to prevent corrosion and to disinfect the towers on-site.

In 2023, BNL-licensed pesticide applicators, in conjunction with the Environmental Protection Division (EPD) subject matter experts, reduced the amount of corn being placed inside the 4-Poster[™] Tick Control Devices to 100 lbs. per week (see Chapter 6 for more details on these devices) to more effectively treat the target species (deer) and to minimize non-target species corn consumption. This strategy has resulted in the reduction of the amount of pesticide applied to the rollers on the devices. The amount of overall pesticide usage in 2023 versus previous years has decreased while maintaining effectiveness at a 75% reduction in the number of ticks compared to when the Lab began using the devices in 2013. Prior to February 1 of every year, each BNL pesticide applicator submits application records to EPD staff for review and electronic submittal using a NYS-DEC-approved software application. This annual report details insecticide, rodenticide, algaecide, and herbicide use for the previous year by licensed BNL staff members. Contractors who apply pesticides and cooling tower biocides are responsible for filing their own reports.

3.12 Wetlands and River Permits

As noted in Chapter 1, portions of the site are situated in the Peconic River floodplain. Portions of the Peconic River are listed by NYSDEC as "scenic" under the New York Wild, Scenic, and Recreational River Systems Act. The Laboratory also has six areas regulated as wetlands and several 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 (BNL 2021 and BNL 2023a) 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. There were no open permits in 2023.

3.13 Protection of Wildlife

3.13.1 Endangered Species Act

BNL updates its list of species that are endangered, threatened, and/or of special concern (see Table 6-1 in Chapter 6) as data from state and federal sources are provided. The northern long-eared bat *(Myotis septentrio-nalis)* is the first federally listed species known to be present at the Laboratory. This species is known historically to utilize the site at least during the summer months, and management options have been established for the protection of this species on-site.

State-recognized endangered (E) or threatened (T) species at BNL include: eastern tiger salamander (E), peregrine falcon (E), Persius dusky-wing (E), bracken fern (E), crested fringed orchid (E), Engelman spikerush (E), dwarf huckleberry (E), whorled loose strife (E), prostrate knotweed (E), possum haw (E), ipecac spurge (E), swamp darter (T), banded sunfish (T), frosted elfin (T), little bluet (T), scarlet bluet (T), pine barrens bluet (T), northern harrier (T), stargrass (T), eastern showy aster (T), and stiff-leaved goldenrod (T).

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

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sites, historical collection for the bait and pet trade, water level fluctuations, pollution, and general disturbance of breeding sites. The BNL Natural Resource Management Plan (NRMP) (BNL 2021) formalizes the strategy and actions needed to protect 26 confirmed tiger salamander breeding locations on-site. The strategy includes identifying and mapping habitats, monitoring breeding conditions, improving breeding sites, and controlling activities that could negatively affect breeding.

Peregrine falcons are listed as endangered in New York State due to historic declines associated with dichlorodiphenyltrichloroethane (DDT). While falcons have been documented in the past (2021 and 2022), there was no indication of nesting in 2023.

Banded sunfish and swamp darter have historically been found in the Peconic River drainage areas on-site. Both species are listed as threatened within New York State, with eastern Long Island having 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 habitats include eliminating, reducing, or controlling pollutant discharges to the Peconic River; monitoring populations and water quality to ensure that habitat remains viable; and minimizing disturbances to the river and adjacent banks. Due to an extended drought from 2015 through mid-2023, these two fish are not likely to be found on-site. Should NYSDEC establish a recovery plan, fish may be restored to historic habitats in the future.

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 the mottled duskywing. None have been documented in recent surveys. Limited habitat for the frosted elfin and persius duskywing exists on Laboratory property and the mottled duskywing may exist on-site; therefore, the need to manage habitat and surveys for the three butterflies has been added to the NRMP.

Surveys for damselflies and dragonflies conducted periodically during the summer months confirmed the presence of one of the three threatened species of damselflies expected to be found on-site. The pine barrens bluet, a threatened species, has been documented at one of the many coastal plain ponds 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, whippoorwill, vesper sparrow, redheaded woodpecker, osprey, sharp-shinned hawk, and Cooper's hawk.

The management efforts for the tiger salamander also benefit the marbled salamander. At present, no protective measures are planned for the eastern box turtle or spotted turtle, as little activity occurs within their known habitat at the Laboratory. The Laboratory continues to evaluate bird populations as part of the management strategy outlined in the NRMP.

The Laboratory has 33 plant species that are protected under state law: eight are endangered; three are threatened (as listed above); and four are rare plants: the small-flowered false foxglove, narrow-leaved bush clover, wild lupine, and long-beaked bald rush. The other 18 species are "exploitably vulnerable," meaning that they may become threatened or endangered if factors that result in population declines continue. These plants are currently sheltered due to the large areas of undeveloped pine barren habitat on-site. Five species on the BNL list are likely present or possible due to the presence of correct habitat.

As outlined in the NRMP, locations of these rare plants must be determined, populations estimated, and management requirements established. See Chapter 6 for further details.



3.13.2 Migratory Bird Treaty Act

As mentioned in Chapter 1, the Laboratory has identified more than 185 species of migratory birds since 1948; of those, approximately 84 species nest on-site. Under the Migratory Bird Treaty Act, migratory birds are protected from capture, harassment, and destruction or disturbance of nests without permits issued by the U.S. Fish and Wildlife Service. In the past, migratory birds have caused health and safety issues, especially through the deposition of fecal matter and the birds' assertive protection of nesting sites. When this occurs, proper procedures are followed to allow the birds to nest and preventive measures are taken to ensure that they do not

cause problems in the future (e.g., access to nesting is closed or repaired, and/or deterrents to nesting are installed). Canada geese *(Branta canadensis)* are managed under an annual permit from the U.S. Fish and Wildlife Services goose nest management program. Occasionally, nesting migratory birds come in conflict with ongoing or planned construction activities. When this occurs, the United States Department of Agriculture, Animal Plant Health Inspection Service, Division of Wildlife Services (USDA-APHIS-WS) is called for consultation and resolution, if possible. Each incident is handled on a case-by-case basis to ensure the protection of migratory birds, while maintaining fiscal responsibility. See Chapter 6 for more information on migratory birds.

3.13.3 Bald and Golden Eagle Protection Act

While BNL does not have bald or golden eagles nesting on-site, these birds are occasionally observed visiting the area during migration. Since the first documented nesting on Long Island in 2013, bald eagles have become a common site on Long Island and at BNL. Bald eagles are seen at numerous locations on the BNL site throughout the year. Further information on bald eagles is presented in Chapter 6.



Peregrine falcon sitting on ledge at Center for Functional Nanomaterials.

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Public Notification of Clearance of Property

In accordance with DOE Order 458.1, authorized releases of property suspected of containing residual radioactive material must meet DOE and other federal, state, and local radiation protection policies and requirements. Released property must be appropriately surveyed, and the Laboratory must adequately demonstrate that authorized limits are met. In addition, documentation supporting the release of property should be publicly available. The release of property off the BNL site from radiological areas is controlled. No vehicles, equipment, structures, or other materials from these areas can be released from the Laboratory unless the amount of residual radioactivity on such items is less than the authorized limits. The default authorized limits are specified in the BNL Site Radiological Control Manual (BNL 2023 Rev. 13) and are consistent with the pre-approved authorized release limits set by DOE Order 458.1.

In 2023, excess materials not identified as radioactive, such as scrap metal and electronics equipment resulting from normal operations, were released to interested parties or to an off-site location. All materials were surveyed, as required, using appropriate calibrated instruments and released based on the DOE pre-approved authorized release limits. There were no releases of real property in 2023.

3.15 External Audits and Oversight

3.15.1 Regulatory Agency Oversight

A number of federal, state, and local agencies oversee BNL activities. In addition to external audits and oversight, the Laboratory has a comprehensive self-assessment program, as described in Chapter 2. In 2023, BNL was inspected by federal, state, or local regulators on seven occasions. These inspections included:

- Potable Water. On July 11, SCDHS performed the Annual Water Supply Sanitary Survey of the BNL potable water system. There were no violations identified; corrective actions for any minor deficiencies were established and communicated with SCDHS and were addressed by the Laboratory's Energy & Utilities Division.
- STP. SCDHS conducts quarterly inspections of the Laboratory's STP to evaluate operations and sample the effluent for SPDES compliance. No performance or operational issues were identified. SCDHS also visited the site in August to collect samples and perform SPDES inspections of other permitted outfalls. No issues were identified.
- RCRA. In September 2023, the NYSDEC conducted an inspection of RCRA hazardous waste activities. A letter documenting the inspection was received in October which indicated that two violations were observed. Please see section 3.9 and Table 3-10 for more details.

3.15.2 DOE Assessments/Inspections

The DOE Brookhaven Site Office (BHSO) performs routine inspections, assessments, and surveillances of BNL operations to ensure continual improvement and success in meeting the Laboratory's mission. In 2023, BHSO participated as an observer of Brookhaven Science Associates (BSA) Multi-Topic Assessment of BNL's environmental protection programs described below. BHSO participation comprised of observing BSA's scoping, assessment conduct, and reporting.

3.15.3 Environmental Multi-Topic Assessment

The BNL EPD conducts routine programmatic assessments. The determination of topics for these assessments is based upon past regulatory findings, results of environmental, safety, and health inspections and/or other routine self-assessments, and frequency of past assessments.

In 2023, EPD planned for and executed a programmatic self-assessment on Environmental Monitoring of Historical Contamination and Soil Activated Areas. The scope of this assessment was to judge compliance with the Standards-Based Management System (SBMS) Environmental Monitoring Subject Area and other processes, procedures, and programs associated with Historical Contamination and Soil Activated Areas at BNL. This included compliance with the Accelerator Safety Subject Area and associated organization-level procedures. Based on the assessed organizations, the assessment team concluded that BNL's Environmental Monitoring Program of Historical Contamination and Soil Activated Areas is compliant with the relevant requirements and resulted in one (1) Noteworthy Practice, no Nonconformances or Observations, and four (4) Opportunities for Improvement. Corrective actions for the identified opportunities for improvement were tracked to closure.

3.15.4 Nevada National Security Site

The Laboratory continues to be a certified Nevada National Security Site (NNSS) waste generator. As part of the NNSS waste certification process, the NNSS Maintenance and Operations Contractor conducts annual assessments of generator Waste Certification Programs (WCP).



BNL's WCP Program was assessed in October 2023 by staff from Navaro (NNSS Management and Operations [M&O] Contractor) in the areas of waste traceability and packaging & transportation. The assessment resulted in no findings, observations, or opportunities for improvement, enabling BNL continued access to the NNSS for radioactive waste disposal.

3.16

Agreements, Enforcement Actions, and Other Environmental Occurrence Reports

In addition to the rules and regulations discussed throughout this chapter, there were two existing agreements between BNL, DOE, and regulatory agencies that remained in effect and one Notice of Violation (NOV) assessed in 2023 (see Table 3-10).

Number	Title	Parties	Effective Date	Status				
Agreements								
No Number	Suffolk County Agreement	BNL, DOE, SCDHS	Originally signed on 09/23/87	This agreement was developed to ensure that the storage and handling of toxic and hazardous materials at BNL conform to the environmental and technical requirements of Suffolk County codes.				
II-CERCLA- FFA-00201	Federal Facility Agreement under the CERCLA Section 120 (also known as the Interagency Agreement or "IAG" of the Environmental Restoration Program)	DOE, EPA, NYSDEC	02/28/92	This agreement provides the framework, including schedules, for assessing the extent of contamination and conducting cleanup at BNL. Work is performed either as an Operable Unit or a Removal Action. The IAG integrates the requirements of CERCLA, RCRA, and NEPA. Cleanup is currently in long-term surveillance and maintenance mode for the groundwater treatment systems, former soil/sediment cleanup areas, and the reactors; this includes monitoring of institutional controls. The HFBR reactor vessel is scheduled for decontamination and decommissioning by 2072. All groundwater treatment systems operated as required in 2023. Management of the characterization and remediation of PFOS, PFOA and 1,4-dioxane was formally included under the BNL CERCLA program.				
Notices of Violation/Enforcement Actions in 2023.								
No Number	Notice of Violation (NOV)	NYSDEC	10/26/23	On October 26, 2023, the Laboratory received a NOV for a NYSDEC hazardous waste compliance inspection that took place from September 27th to 29th. The notice of violation included two violations. The first violation was due to two small bags of used lithium and metal hydride batteries being observed in the building 815 90-Day Area which were labeled with an accumulation start date of September 1, 2022. The second violation was due to four containers of spent fluorescent lamps located in the 90-Day storage area, building 630 with no label of an accumulation start date. BNL Environmental, Safety, and Health Directorate staff began immediate planning for the correction of these deficiencies and addressed the findings in accordance with NYSDEC directives.				
Notes: CERCLA = Comp Liability Act EPA = Environme	rehensive Environmental Rental Rental Protection Agency	esponse, Compe	ensation and	NYSDEC = New York State Department of Environmental Conservation RCRA = Resource Conservation and Recovery Act SCDHS = Suffolk County Department of Health Services				

Table 3-10. Existing Agreements and Enforcement Actions Issued to BNL With Status.

EPA = Environmental Protection Agency

NEPA = National Environmental Policy Act



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