Compliance Status

CHAPTER 3

Brookhaven National Laboratory (BNL) is subject to more than 50 sets of federal, state and local environmental regulations and 60 site-specific permits. Tables 3-1, 3-2, and 3-3 itemize and describe these requirements. Routine checks are made to ensure that permit limits are met.

For regulations where monitoring is necessary, a brief description of the legislation and compliance status is given in this chapter. In 1998, BNL operated in compliance with the majority of these regulations. Exceptions include nine minor exceedances of wastewater discharge permit limitations, and noncompliance with certain administrative hazardous waste requirements for short-term storage. Chapters 5 and 6 provide details on air and water quality monitoring results.

Emissions that affect global warming, such as nitrogen oxides (NO_x) and sulfur dioxide (SO_2) were within permit limits. Three halon fire suppression systems were deactivated and 156 kilograms of halon recovered. Over 900 pounds of ozone-affecting refrigerants were recovered for recycling.

Improvements that helped ensure compliance this year, and for future years, include the upgrade to the Sewage Treatment Plant from primary to tertiary treatment facilities and the Spill Prevention Control Plan upgrade so that BNL is in full compliance with New York State Department of Environmental Conservation (NYSDEC) regulations and Department of Energy (DOE) orders. Fourteen spills occurred that were subject to reporting requirements; all were cleaned-up to NYSDEC satisfaction. BNL is taking steps to ensure full compliance with the applicable requirements of the Suffolk County Department of Health Services (SCDHS) toxic and hazardous materials storage regulations in Article 12. Twenty-six storage tanks were permanently removed, 31 were refitted with containment measures and more tanks will continue to be upgraded to meet Article 12 standards. There were no semi-volatile or floating products in groundwater at the Major Petroleum Facility.

External audits were conducted by the NYSDEC for hazardous waste and air emissions from the Central Steam Plant. In 1998, BNL was not cited by the NYSDEC or U.S. Environmental Protection Agency (USEPA) for violations. The SCDHS inspects potable water facilities annually and found the BNL potable water system to meet all drinking water requirements. A DOE inspection noted significant improvements in the groundwater protection program and restoration work.

3.1 COMPLIANCE WITH ENVIRONMENTAL REQUIREMENTS

The many federal, state and local environmental statutes and regulations that BNL operates under are summarized in Table 3-1, along with a discussion of BNL's compliance status with regard to each requirement.

3.2 ENVIRONMENTAL PERMITS

A variety of processes and facilities at BNL operate under permits issued by environmental regulatory agencies. These permits include a State Pollutant Discharge Elimination System (SPDES) permit, a Major Petroleum Facility (MPF) license, a Resource Conservation Recovery Act (RCRA) permit for the new Waste Management Facility (WMF), a certificate from the New York State Department of Environmental Conservation (NYSDEC) registering tanks storing bulk quantities of hazardous substances, NYSDEC certificates for two registered gasoline vapor recovery systems, eight authorizations for the National Emission Standards for Hazardous Air Pollutants (NESHAPs), and 46 Certificates to Operate (CO) air emission sources from NYSDEC.

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

Regulator, (Federal/State) Citation	Regulatory Program Description	Compliance Status	Report Reference Sections
USEPA/NYSDEC 40 CFR Parts 300, 302, 355 and 370 /None	CERCLA provides the regulatory framework for the remediation of releases of hazardous substances and the remediation of inactive hazardous waste disposal sites.	In 1989 BNL entered into a tri-party agreement between USEPA, NYSDEC and DOE. Remediation of the BNL site is conducted by the ER program in accordance with milestones established under this agreement.	2.8
USEPA/NYSDEC 40 CFR Part 50 - 80/ 6NYCRR Part 200 -258, 307	The Clean Air Act and the NYS Environmental Conservation Law regulate the release of air pollutants through the use of permits and air quality limits.	All air emission sources have permits or have been exempted under the NYS air program. Emissions of radionuclides are regulated by the USEPA, under NESHAPs authorizations.	3.5
U.S. Fish and Wildlife Service/NYSDEC 50 CFR Part 11/ 6NYCRR Part 182	The Endangered Species Act and corresponding NYS regulation prohibit activities that would jeopardize the continued existence of an endangered or threatened species or cause adverse modification to a critical habitat.	One Endangered Species has been identified onsite (the tiger salamander) and one NYS Species of Special Concern (the banded sunfish). The Laboratory is preparing a Wildlife Management Plan that outlines activities to protect species and enhance habitat.	3.12
USEPA/NYSDEC 40 CFR Part 162 - 171/ 6NYCRR Parts 320 - 329	The Federal Insecticide, Fungicide, and Rodenticide Act and corresponding NYS regulations governs the manufacture, and use of biocides, specifically the use, storage and disposal of pesticides and herbicides and pesticide containers and residuals.	The BNL maintains certified pesticide applicators for the application of pesticides/ herbicides site-wide. Each applicator attends training as needed to maintain all certifications current. Annual reports detailing the quantity and types of pesticides applied are filed for each applicator each year by February 1st.	3.10
USDOE/None 10 CFR Parts1021, 40 CFR Part 1021, 1500-1508	The National Environmental Policy Act (NEPA) requires federal agencies to follow a prescribed process to evaluate the impacts of proposed major federal actions and alternatives on the environment before an irreversible commitment of resources is made. The Department of Energy has codified its implementation of NEPA in 10 CFR 1021.	BNL is in full compliance with the NEPA requirements.	3.3

Table 3-1
Federal, State and Local Environmental Statutes Applicable to the BNL *(cont'd.)*

Regulator, (Federal/State) Citation	Regulatory Program Description	Compliance Status	Report Reference Sections
Advisory Council on Historic Preservation 36 CFR Parts 60, 63, 79, 800	The National Historic Preservation Act identifies, evaluates and protects historic properties eligible for listing in the National Register of Historic Places. Historic properties can be archeological sites, historic structures or historic document records or objects.	Three locations at BNL, Brookhaven Graphite Research Reactor, Old Cyclotron Complex, and World War I experimental foxhole trenches were identified by the New York State Historic Preservation Officer (NYSHPO) as potentially eligible for inclusion in the National Register of Historic Places in April 1991. Any activities involving these facilities is identified utilizing the NEPA process and an evaluation is initiated to determine if the proposed action would impact those features which extend eligibility to these facilities. To date, no actions have been proposed which have required additional consultation with the NYSHPO. Compliance with the intent of these laws has been achieved by BNL, although program implementation has not been fully developed beyond the NEPA process.	3.4
USEPA/NYSDEC 40 CR Part 109 -140, 230, 231, 401, 403/ 6NYCRR Parts 700-703, 750 - 758	The Clean Water Act and corresponding State Environmental Conservation Law seek to improve the quality of the waters of the US/ State by implementing a permitting program and establishing water quality standards.	Wastewater discharges are permitted by the NYSDEC. Permitted discharges include treated sanitary waste, cooling tower and stormwater discharges. With the exception of nine minor excursions, these discharges met the SPDES permit limits in 1998.	3.6
USEPA/NYSDEC 40 CFR Part 141-149/ 10 NYCRR Part 5	The Safe Drinking Water Act and NYS Department of Health standards for public water supplies, establish minimum drinking water standards and monitoring requirements.	BNL maintains a community water supply. This water supply meets all primary and secondary drinking water standards and operational and maintenance requirements.	3.6.3
USEPA/NYSDEC 40 CFR Part 260 - 280/ 6NYCRR Part 360 - 374	The Resource Conservation Recovery Act and NYS 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 two permitted storage facilities. While almost all wastes are handled and disposed in accordance with all Federal and State requirements, audits have identified several violations. These are being addressed by corrective action plans. All USTs were in compliance with the 12/22/98 deadline for upgrade.	3.8
USEPA/None40 CFR Part 700 - 766	The Toxic Substances Control Act regulates the manufacture, use and distribution of all regulated substances.	BNL manages all TSCA regulated materials, including PCBs, in compliance with all requirements.	3.9

Table 3-2 provides a summary of these permits. This table is organized by building number and then by type of permit. In addition to those listed, the operation of three groundwater pump and treat systems installed under the Interagency Agreement (IAG) are authorized under SPDES and air emission equivalency permits.

3.2.1 NEW OR MODIFIED PERMITS

3.2.1.1 STATE POLLUTANT DISCHARGE ELIMINATION SYSTEM (SPDES)

To accommodate wastewater effluents generated by Relativistic Heavy Ion Collider (RHIC) facilities, BNL submitted a request in 1997 to NYSDEC to modify the SPDES permit.

Table 3 -2. BNL Environmental Permits

Bldg./Facility Designation	Process/Equipment Description	Permitting Agency and Division	Permit Number	Expiration Date
197	welding shop	NYSDEC-Air Quality	472200 3491 19704	04-01-00
197	epoxy coating/curing exhaust	NYSDEC-Air Quality	472200 3491 19708	06-08-98(3)
206	cyclone G-10	NYSDEC-Air Quality	472200 3491 20601	04-01-00
207	belt sander	NYSDEC-Air Quality	472200 3491 20701	04-01-00
244	cyclone collector	NYSDEC-Air Quality	472200 3491 24401	01-28-99(3)
422	cyclone collector	NYSDEC-Air Quality	472200 3491 42202	11-29-96(3)
422	cyclone collector	NYSDEC-Air Quality	472200 3491 42203	11-29-96(3)
423	stage II vapor recovery	NYSDEC-Air Quality	472200 D365 WG	09-27-95(1)
423	welding hood	NYSDEC-Air Quality	472200 3491 42305	05-15-01
458	paint spray booth	NYSDEC-Air Quality	472200 3491 45801	04-23-97(3)
462	machining, grinding exhaust	NYSDEC-Air Quality	472200 3491 46201	11-29-96(3)
462	machining, grinding exhaust	NYSDEC-Air Quality	472200 3491 46202	11-29-96(3)
473	vapor degreaser/fume hood	NYSDEC-Air Quality	472200 3491 47301	03-22-96(4)
479	cyclone G-10	NYSDEC-Air Quality	472200 3491 47905	04-01-00
490	Inhalation Toxicology Facility	NYSDEC-NESHAPs	472200 3491 49001	05-15-01
490	Inhalation Toxicology Facility	NYSDEC-Air Quality	472200 3491 49002	05-15-01(2)
490	lead alloy melting	NYSDEC-Air Quality	472200 3491 49003	05-15-01
490	milling machine/block cutter	NYSDEC-Air Quality	472200 3491 49004	05-15-01
510	metal cutting exhaust	NYSDEC-Air Quality	472200 3491 51002	09-30-98(3)
510	calorimeter enclosure	U.S. EPA - NESHAPS	BNL-689-01	None
526	polymer mix booth	NYSDEC-Air Quality	472200 3491 52601	04-01-00
526	polymer weighing	NYSDEC-Air Quality	472200 3491 52602	04-01-00
535B	plating tank	NYSDEC-Air Quality	472200 3491 53501	04-01-00
535B	etching machine	NYSDEC-Air Quality	472200 3491 53502	04-01-00
535B	PC board process	NYSDEC-Air Quality	472200 3491 53503	05-15-01
535B	welding hood	NYSDEC-Air Quality	472200 3491 53504	09-30-98(3)
555	scrubber	NYSDEC-Air Quality	472200 3491 55501	04-01-00(2)
555	scrubber	NYSDEC-Air Quality	472200 3491 55502	04-01-00(2)
610	combustion unit	NYSDEC-Air Quality	472200 3491 6101A	05-15-01
610	combustion unit - ALF	NYSDEC-Air Quality	472200 3491 61005	05-15-01
610	combustion unit	NYSDEC-Air Quality	472200 3491 61006	05-15-01
610	combustion unit	NYSDEC-Air Quality	472200 3491 61007	12-18-02
630	stage II vapor recovery	NYSDEC-Air Quality	472200 D366 WG	09-27-95(1)
703	machining exhaust	NYSDEC-Air Quality	472200 3491 70301	05-15-01
705	building ventilation	U.S. EPA - NESHAPS	BNL-288-01	None
820	accelerator test facility	U.S. EPA - NESHAPS	BNL-589-01	None
865	lead melting pot	NYSDEC Air Quality	472200 3491 86501	01-14-03
902	spray booth exhaust	NYSDEC-Air Quality	472200 3491 90201	09-30-98
902	belt sander	NYSDEC-Air Quality	472200 3491 90202	05-15-01
902	sanding, cutting, drilling	NYSDEC-Air Quality	472200 3491 90203	05-15-01
902	brazing/soldering exhaust	NYSDEC-Air Quality	472200 3491 90204	05-15-01
902	painting/soldering exhaust	NYSDEC-Air Quality	472200 3491 90205	05-15-01
903	cyclone G-10	NYSDEC-Air Quality	472200 3491 90302	04-01-00
903	brazing process exhaust	NYSDEC-Air Quality	472200 3491 90303	09-30-98
905	machining exhaust	NYSDEC-Air Quality	472200 3491 90503	05-15-01
919A	solder exhaust	NYSDEC-Air Quality	472200 3491 91903	05-15-01
922	cyclone exhaust	NYSDEC-Air Quality	472200 3491 92201	04-01-00
923	electronic equip. cleaning	NYSDEC-Air Quality	submitted 3-93,	STATUS PENDING
924	spray booth exhaust	NYSDEC-Air Quality	472200 3491 92401	09-30-98
924	magnet coil production press	NYSDEC-Air Quality	472200 3491 92402	05-15-01
924	machining exhaust	NYSDEC-Air Quality	472200 3491 92403	05-03-98
930	electroplating/acid etching	NYSDEC-Air Quality	472200 3491 93001	05-15-01
930	bead blaster	NYSDEC-Air Quality	472200 3491 93002	05-15-01
AGS Booster	accelerator	U.S. EPA - NESHAPS	BNL-188-01	None
RHIC (a)	accelerator	U.S. EPA - NESHAPS	BNL-389-01	None

Table 3 -2. BNL Environmental Permits *(cont'd.)*

Bldg./Facility Designation	Process/Equipment Description	Permitting Agency and Division	Permit Number	Expiration Date
Radiation therapy facility		U.S. EPA - NESHAPS	BNL-489-01	None
Radiation effects /neutral beam		U.S. EPA - NESHAPS	BNL-789-01	None
CSF(b)	major petroleum facility	NYSDEC-Water Quality	1-1700	03-31-02
STP(c) &RCB(d)	sewage plant & recharge basins	NYSDEC-Water Quality	NY-0005835	03-01-00
WMF (e)	waste management	NYSDEC-Hazardous Waste	NYS ID No 1-4722-00032/00102-0	07-12-05
BNL Site	chem tanks-HSBSRC (f)	NYSDEC	1-000263	07-27-99

Notes:
a. Relativistic Heavy Ion Collider
b. Central Steam Facility
c. Sewage Treatment Plant
d. Recharge basins
e. New Waste Management Facility
f. Hazardous Substance Bulk Storage Registration Certificate.

1. Renewal submitted 9-6-95, NYSDEC has indicated the process is subject to registration only.
2. Process is not in service.
3. Permits for processes with past due expiration dates have been extended until NYSDEC approves BNL's Title V permit or until the NYSDEC reclassifies the processes as exempt and trivial pursuant to Part 201 provisions.
4. The vapor/sonic degreaser and fume hood shared a common exhaust stack. The degreaser has been removed. The fume hood is still used for aerosol spray coating and wipe cleaning of parts.

*Note: Renewal application submitted more than 30 days prior to expiration date; process can continue to operate under provisions of the NYS Uniform Procedures Act.

A draft permit was received in April 1998, that included temporary authorization to locally discharge cooling water blowdown from Buildings 1008, 1010, 1002, and 1004, as well as a stormwater discharge from the former Hazardous Waste Management Facility (HWMF). Permanent connection of these discharges to existing permitted point sources will be complete in 2001. The NYSDEC also included provisions to apply the more stringent of either the surface water or groundwater discharge standard to Sewage Treatment Plant (STP) effluent. These permit changes are expected to be finalized in 1999.

3.2.1.2 AIR

- WMF: In February 1998, the NYSDEC issued an operating permit for the lead melting pot to be used to process old lead shielding. The melter is located in Building 865 of the WMF.
- Title V: Facilities that are considered major sources of criteria pollutants or hazardous air pollutants must obtain a Title V operating permit under the Clean Air Act (CAA). This permit consolidates all emission sources and all of the applicable federal and state regulatory requirements into a single document. Since Central Steam Facility (CSF) boiler emissions of oxides of nitrogen and sulfur dioxide (NO_x and SO_2) exceed the major facility annual thresholds of 25 tons and 100 tons, respectively, BNL was classified as a major source.

The Title V Phase I application was submitted to the NYSDEC in December 1997. This part of the application summarized the applicable regulatory requirements, described site operations and activities, and summarized the pollutants released by BNL sources. The application also included a compliance plan to address three issues that were identified during its preparation, and a statement certifying that BNL will continue to comply with all applicable requirements.

Phase II of the application was submitted in December 1998. Before the application was prepared, BNL conducted walk-through inspections of all facilities. The inspections identified more than 2,800 emission sources. Most of these were classified as exempt or trivial sources in accordance with provisions of 6 NYCRR Part 201, and included processes such as welding/soldering, degreasing, sandblasting, machining, aerosol painting, and parts cleaning. Activities or emission sources that share common regulatory requirements

were grouped together into sixteen emission units. Individual permits for processes have been extended until NYSDEC issues BNL's Title V Permit, or until NYSDEC reclassifies the processes as exempt or trivial under Part 201 provisions. Table 3-3 summarizes the sources included in each emission unit, and the applicable regulatory requirements.

3.3 NATIONAL ENVIRONMENTAL POLICY ACT (NEPA)

Provisions in NEPA require federal agencies to follow a prescribed process to evaluate the impacts of proposed major federal activities on the environment before an irreversible commitment of resources is made. During 1998, environmental evaluations were completed for 115 proposed projects in accordance with Department of Energy (DOE) Order 451.1 and 10 CFR 1021 (DOE's Rules Implementing NEPA). Of these, 74 were considered minor actions requiring no additional documentation, and 41 projects were addressed through submission of Environmental Evaluation Notification Forms to DOE. An Environmental Assessment was completed and a Finding of No Significant Impact issued for the Booster Applications Facility. BNL also provided information to DOE and DOE contractors on the preparation of an Environmental Impact Statement for BNL's High Flux Beam Reactor (HFBR). This document is expected to be released for public review and comment during 1999.

3.4 NATIONAL HISTORIC PRESERVATION ACT/ ARCHEOLOGICAL RESOURCE PROTECTION ACT (NHPA/ARPA)

These two acts identify, evaluate and protect historical and archeological sites eligible for listing in the National Register of Historical Places. The sites may include Native American Indian lands and historic structures, objects and documents. During 1998, activities associated with NHPA/ARPA were limited to completion of the annual Department of Interior questionnaire regarding historic/ cultural resources. Staff attended a training

Table 3-3. Summary of Title V Permit Application Emission Units

Emission Unit ID	Emission Unit Description	Applicable Regulations	Summary of Requirements
U45801	Unit is a paint spray booth used to apply protective and decorative coatings to miscellaneous metal parts and room furnishings.	6 NYCRR Part 228	Establishes VOC content limits for coatings based on the type of surfaces coated.
U49001	Unit has three walk-in enclosures used for research on processes to treat fireproofing products by chemically converting the asbestos containing material into a non-regulated asbestos-free product. Redundant High Efficiency Particulate Arrestor (HEPA) filters are used in the exhaust system. Caustic and acidic aerosols generated by the process are controlled by a wet scrubber device.	40 CFR 61 Subpart M	Requires the use of HEPA filters certified to remove at least 99.97 percent of 0.3 micron particles and daily visual monitoring of potential source of asbestos emissions including air cleaning devices and process equipment.
U49003	Unit has a lead melting machine, a milling machine, and a block cutter used to fabricate block shielding fabricated for patients who receiving treatment at the Radiation Therapy Facility. The shielding, is styrofoam and lead alloy used to protect against unwanted radiation. Particulates are collected in a fabric filter.	6 NYCRR Part 212 6 NYCRR Part 200	Limits particulate emissions to 0.05 grains/ dry standard cubic foot, for emission sources whose permit to construct was received by NYSDEC after July 1 1973. Requires emission control devices to be operated and maintained properly.
U61005	Unit is two Central Steam Facility, commercial-institutional sized boilers. Boiler 1A, a midsize boiler, has a nominal heat capacity of 16.4 MW (56.7 MMBtu/hr) used for peaking and intermittent loads. Boiler 5, a large boiler with nominal heat capacity of 65.3MW (225 MMBtu/hr), is used to meet winter baseloads. Boiler 5 has dual fuel (oil or natural gas) capabilities.	6 NYCRR Part 225-1 6 NYCRR Part 225-2 6 NYCRR Part 227-1 6 NYCRR Part 227-2	Limits sulfur content of fuel oils. Limits contaminants in oil burned in boilers. Establishes opacity limits for boilers. Establishes NOx emission limits for large and midsize boilers that burn natural gas and oil.

Table 3-3. Summary of Title V Permit Application Emission Units *(cont'd.)*

Emission Unit ID	Emission Unit Description	Applicable Regulations	Summary of Requirements
U61006	Unit is a commercial-institutional sized boiler with a nominal heat capacity of 42.6 MW (147 MMBtu/hr) located at the Central Steam Facility. Boiler 6 has dual fuel firing capabilities that allow it to burn oil or natural gas.	6 NYCRR Part 225-1 6 NYCRR Part 225-2 6 NYCRR Part 227-1 6 NYCRR Part 227-2 40 CFR 60 Subpart Db	Limits sulfur content of fuel oils. Limits contaminants in oil burned in boilers. Establishes opacity limits for boilers. Establishes NOx emission limits for large and midsize boilers burning natural gas and oil. Requires continuous monitoring systems to measure NOx emissions.
U61007	Unit is a Central Steam Facility commercial-institutional sized boiler with a nominal heat capacity of 42.6 MW (147 MMBtu/hr) built in 1996. Constructed after June 19 1986, it requires continuous emission monitoring for opacity. This boiler has dual fuel firing capabilities allowing it to burn oil or natural gas.	6 NYCRR Part 225-1 6 NYCRR Part 225-2 6 NYCRR Part 227-1 6 NYCRR Part 227-2 40 CFR 60 Subpart Db	Limits sulfur content of fuel oils. Limits contaminants in oil burned in boilers. Establishes opacity limits for boilers. Limits NOx emission for large and midsize boilers. Requires continuous monitoring systems to measure NOx emissions.
UFLEET	Unit is BNL's fleet of vehicles of 244 gasoline powered vehicles with gross vehicle weight ratings (GVWRs) of 8500 pounds or less, and 46 gasoline powered vehicles with GVWRs greater than 8500 pounds. The remaining fleet vehicles are exempt from Part 217.	6 NYCRR Part 217	Sets inspection and maintenance require-ments for gasoline and diesel powered vehicles. Emission and safety inspections are done at Building 630; maintenance and repairs at the vehicle maintenance shop.
UFUELS	Unit is two onsite gasoline refueling facilities. Building 630 is contractor operated servicing employee vehicles. The facility has three pumps that dispense low, medium and high octane grades of gasoline. Building 423, is a refueling facility for BNL fleet gasoline powered vehicles with two pumps dispensing low octane gasoline. Underground storage tanks at both facilities have Stage I and Stage II engineering controls.	6 NYCRR Part 225-3 6 NYCRR Part 230	Limits the Reid vapor pressure of gasoline from May 1st to September 15th, oxygen content October 1st to April 30th, and re-quires the sale of reformulated gas all year. Specifies Stage I and Stage II engineering controls at all refueling stations that pump more than 454,000 liters (120,000 gallons).
UHALON	Unit has 593 portable Halon 1211 fire extinguishers, 138 Halon 1301 cylinders with 39 fixed total flooding fire suppression systems and three Halon 1301 reserve tanks.	40 CFR 80 Subpart H	Requires certified technicians and halon recovery equipment to test, service, main-tain, repair, or dispose halon-containing equipment.
UINSIG	Unit has a magnet coil coating operation, the Printed Circuit Board Laboratory, an operation for etching magnet end blocks, and a small scale printed circuit board etching and electroplating operation.	6 NYCRR Part 201-6	Requires maintenance of records to verify aggregate emissions of criteria pollutants and hazardous air pollutants from all sources are below levels established in Section 201-6.3.
ULEADM	Unit is a soft metal pot furnace installed at the new Waste Management Facility used to recycle lead shielding.	6 NYCRR Part 200	Requires emission control devices be operated and maintained properly.
ULITHO	Unit includes two lithographic offset printing machines used to print BNL's published materials.	6 NYCRR Part 234	Limits the volatile organic compound content of solutions used in printing.
UMETAL	Unit has 16 cold cleaning operations in various site locations to clean metal parts.	6 NYCRR Part 226	Specifies administrative and operating requirements for this equipment.
UMVACS	Unit covers BNL fleet vehicles equipped with air conditioners.	40 CFR 80 Subpart B	Requires certified technicians use refriger-ant recovery equipment when vehicle air conditioners are serviced or repaired.
URADEF	Unit covers on-site activities and operations that generate radioactive airborne emissions.	40 CFR 61 Subpart H	Sets monitoring requirements for emissions of radionuclides so that public does not receive dose higher than 10 mrem/yr.
URFRIG	Unit includes 21 centrifugal chillers, 38 reciprocating chillers, 4 rotary screw chillers, 193 split air conditioning units, and 245 package air conditioning units.	40 CFR 80 Subpart F	Requires certified technicians use refriger-ant recovery equipment when vehicle air conditioners are serviced or repaired.

session conducted by the Advisory Council on Historic Preservation in December 1998. The course has helped to refocus the Laboratory on cultural and historic issues. In 1999, the Laboratory will begin work on a Programmatic Agreement with the Advisory Council, and on petitioning the New York State Historic Preservation Officer to include several BNL facilities on the National Register of Historic Places. Three locations have been identified by the New York State Historic Preservation Office as eligible for inclusion on the National Historic Register: the Brookhaven Graphite Research Reactor (BGRR), the Cosmotron, and foxhole remnants from Camp Upton activities.

3.5 CLEAN AIR ACT (CAA)

The objectives of the CAA regulations (administered by the Environmental Protection Agency [USEPA] and NYSDEC) are to improve or maintain regional ambient air quality through administrative, 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

BNL has a variety of non-radioactive air emissions sources that are subject to federal or state regulations. The following subsections describe the most significant sources and the methods used to comply with the applicable regulatory requirements.

Reasonable Available Control Technology (RACT)

Requirements in RACT establish emission standards for NO_x for boilers with maximum operating heat inputs greater than or equal to 14.5 MW (50 MMBtu /hr). Emission tests conducted in 1995 confirmed that BNL Boilers 1A and 5 met NO_x and SO_2 emission standards when burning low nitrogen and sulfur content residual fuel (below 0.3 percent). To ensure continued compliance, quarterly composite samples of fuel deliveries are analyzed by an outside laboratory to confirm the fuel-bound nitrogen and sulfur content. Compliance with the 130 ng/J (0.30 lbs/MMBtu) NO_x emissions standard for Boilers 6 and 7 is demonstrated by continuous emission monitoring of flue gas. For the year, NO_x emissions from Boilers 6 and 7 averaged 63 ng/J (0.145 lbs/MMBtu) and 61 ng/J (0.140 lbs/MMBtu) respectively, and there were no recorded exceedances of the NO_x emissions standard for either boiler. In 1998, natural gas was the predominant fuel burned in the two boilers.

Halon

To comply with the new halon recovery and recycling requirements of 40 CFR 82, Subpart H that went into effect on April 6, 1998, halon 1211 and 1301 recovery/recycling dquipment was installed on April 21, 1998. These halon recovery/recycling devices are used when portable fire extinguishers or fixed systems are removed from service, and during periodic hydrostatic testing of halon. All BNL personnel who conduct the periodic hydrostatic testing of halon cylinders received vendor training on the use of the new equipment in August 1998. In 1998, three existing halon 1301 fire-suppression systems in Building 490 were deactivated. Approximately 156 kilograms (345 pounds) of halon 1301 was recovered from system cylinders and was placed into halon reserve tanks.

3.5.1.1 OZONE DEPLETING SUBSTANCES (ODS)

All refrigerant recovery and recycling equipment used by refrigerant service technicians is certified to meet refrigerant evacuation levels specified by 40 CFR 82.158. Approximately 890 pounds of R-11, 26 pounds of R-12, and 52 pounds of R-22 were recovered and reclaimed for future use from equipment that was serviced during 1998. Under the BNL Maintenance Management Center, Preventative Maintenance Program, refrigeration equipment containing ODS is regularly inspected and maintained. As a matter of practice, if a refrigerant leak is found, technicians will either immediately repair the leak or will isolate the leak and prepare a work order for the needed repairs. This standard practice exceeds the leak repair provisions of 40 CFR 82.156.

3.5.2 NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS (NESHAPS)

3.5.2.1 MAXIMUM AVAILABLE CONTROL TECHNOLOGY (MACT)

During preparation of the BNL Title V Phase II application, staff examined existing state and federal regulations that are adminis-

tered under the CAA to determine their applicability to BNL activities and operations. Based on this review, it was concluded there are no proposed or promulgated MACT standards applicable to BNL operations.

3.5.2.2 ASBESTOS

In 1995, BNL was issued a permit to operate an exhaust system for equipment used to mix and spray chrysotile asbestos insulation onto test panels in the former Inhalation Toxicology Facility. Prefilters and High Efficiency Particulate Air (HEPA) filters were installed in series in the exhaust systems of each of the three process hoods to meet the pollution control requirements of 40 CFR Part 60, Subpart M. BNL personnel responsible for the mixing and spraying operations conduct regular inspections of the pollution-control equipment and monitor both the equipment and exhaust systems daily for evidence of visible emissions. To date, no visible emissions of asbestos have been observed. As required, BNL provided advance notice to the USEPA Region II office for one demolition job involving the removal of regulated asbestos containing materials. BNL also provided the USEPA with an annual notice of nonscheduled small renovations for 1998. During 1998, 176 linear meters (579 linear feet) of pipe insulation and 47 square meters (505 square feet) of surface material were removed.

3.5.2.3 RADIOACTIVE AIRBORNE EMISSIONS

In 1998, the maximum offsite dose due to airborne radioactive emissions from the Laboratory continued to be far below the 10 mrem annual dose limit in 40 CFR 61, Subpart H. The dose to the Maximally Exposed Individual (MEI) resulting from airborne emissions, calculated using USEPA's CAP88-PC (CAA Assessment Package-1998) model, was 0.2 mrem (2 μSv). More detail on estimated dose is found in Chapter 9. All data pertaining to radiological air emissions and dose calculations were transmitted to the USEPA on time, in fulfillment of the June 30 annual reporting requirement.

3.6 CLEAN WATER ACT (CWA)

The generation and disposal of wastewater effluents generated by Laboratory operations are regulated under the CWA, as implemented by the NYSDEC, and DOE Order 5400.5. The goal of the CWA is to achieve a level of water quality which promotes the propagation of fish, shellfish and wildlife, provide waters suitable for recreational purposes, and to eliminate the discharge of pollutants. New York State was delegated CWA authority in 1975. The SPDES permit provides the basis for regulating wastewater effluents at BNL. The SPDES permit establishes release concentration limits and dictates monitoring requirements.

The BNL SPDES permit was issued in 1995. This permit provides monitoring requirements and lists effluent limits for ten outfalls:

- Outfall 001 is the discharge of treated effluent from the STP to the Peconic River.
- Outfalls 002 - 006, 008 and 010 are recharge basins used for the discharge of cooling tower blowdown, once-through cooling water and stormwater.
- Outfall 007 is backwash water from the Water Treatment Plant filter building.
- Outfall 009 consists of numerous subsurface and surface wastewater disposal systems that receive predominantly sanitary waste, and steam and air compressor discharges.

3.6.1 BNL SEWAGE TREATMENT PLANT (STP) OUTFALL 001

Sanitary and process wastewaters generated by Laboratory operations are conveyed to the STP plant for subsequent treatment prior to discharge to the Peconic River. In 1997, the STP underwent significant structural modifications and was upgraded from a primary plant (i.e., separation of settleable solids and floatables) to a tertiary treatment system (i.e., biological reduction of organic matter and reduction of nitrogen). This treatment process became fully functional in 1998.

A summary of the monitoring results for the STP is provided in Table 3-4. Figures 3-1 through 3-6 plot five year trends for the maximum monthly concentrations of copper, iron, lead, silver, nickel, and zinc in the STP outfall as documented in monitoring reports. The SPDES permit limits are also shown. Due to the inclusion of nickel in the SPDES permit in 1995, the trend plot only contains analytical results for 1995 through 1998. Table 3-4 shows that the Laboratory documented 100 percent compliance with all parameters except iron and Biological Oxygen Demand (BOD) removal in 1998. Iron excursions were reported

Table 3-4. Summary of Analytical Results for Waste Water Discharges to Outfall 001[1]

Analyte	Min.	Max.	Min. Monitoring Frequency	SPDES Limit	No. of Exceedances	Percent Compliance*
Max. Temperature Degrees Fahrenheit	46	81	Daily	90	0	100
pH SU	6	7.1	Cont. Recorder	Min.: 5.8 Max.: 9.0	0	100
Avg. 5 day Biological Oxygen Demand (BOD) mg/L	< 2	3.5	Twice Monthly	Avg.: 10	0	100
Max. 5 day BOD mg/L	< 2	6.9	Twice Monthly	Max.: 20	0	100
% BOD Removal	74	98	Monthly	85	1	92
Avg. Total Suspended Solids (TSS) mg/L	<4	5.2	Twice Monthly	Avg.:10	0	100
Max. TSS mg/L	<4	10.2	Twice Monthly	Max.:20	0	100
% TSS Removal	87	> 98	Monthly	85	0	100
Settleable Solids mg/L	0	0	Daily	0.1	0	100
Ammonia Nitrogen mg/L	< 0.05	0.6	Twice Monthly	2	0	100
Total Nitrogen mg/L	4	11.5	Twice Monthly	NA	NA	100
Cyanide ug/L	<10	<10	Twice Monthly	100	0	100
Copper mg/L	0.043	0.062	Twice Monthly	0.15	0	100
Iron mg/L	0.112	1.6	Twice Monthly	0.37	4	86
Lead mg/L	0.002	0.005	Twice Monthly	0.015	0	100
Nickel mg/L	< 0.003	0.012	Twice Monthly	0.11	0	100
Silver mg/L	0.003	0.009	Twice Monthly	0.015	0	100
Zinc mg/L	0.035	0.09	Twice Monthly	0.1	0	100
Mercury mg/L	0.0001	0.0006	Twice Monthly	0.0008	0	100
Toluene µg/L	< 1	< 1	Twice Monthly	50	0	100
Methylene Chloride µg/L	< 1	3	Twice Monthly	50	0	100
1,1,1-Trichloroethane µg/L	< 1	5	Twice Monthly	50	0	100
2-Butanone µg/L	< 1	< 1	Twice Monthly	50	0	100
Max. Flow MGD	0.65	1.3	Cont.Recorder	Max. 2.3	0	100
Avg. Flow MGD	0.496	0.763	Cont. Recorder	NA	0	100
Avg. Fecal Coliform MPN/100 ml	<2	< 2	Twice Monthly	200	0	100
Max Fecal Coliform MPN/100 ml	<2	2	Twice Monthly	400	0	100

Notes:
ND: Analyte was Not Detected in the samples.
NA: Not Applicable
1. See Figure 4-2.
2. Min. = Minimum
3. Max. = Maximum

$$\% \text{ Compliance} = \frac{\text{Total No. Samples - Total No. Exceedances}}{\text{Total No of Samples}} \times 100$$

in January and February. Investigation of these excursions revealed that the unintentional discharge of 70 gallons of concentrated acid from a plating facility caused metallic iron present in the sewage sludge to become dissolved. The acid discharge resulted from the incomplete neutralization of sulfuric acid being used to precondition newly installed plastic plating tanks. A single excursion of BOD removal was reported during 1998. As discussed in previous Site Environmental Reports, the low concentration of biological matter in the sewage received at the STP makes achieving the 85 percent reduction difficult. Improved sampling techniques and reductions in "clean" water contributions to the STP have proven effective in raising the organic content of the STP influent.

Chronic Toxicity Testing

The chronic toxicity testing program initiated in 1993 for the STP effluent was continued following completion of the STP upgrade project in September 1997. Samples were collected in March, June, September and December and submitted to a contract laboratory for testing. As required by BNL's SPDES permit, this program consists of performing, seven-day, Tier II Chronic Toxicity Tests of the BNL STP effluent. Two fresh water organisms, water fleas (Ceriodaphnia dubia) and fathead minnows (Pimphales promelas), are used for

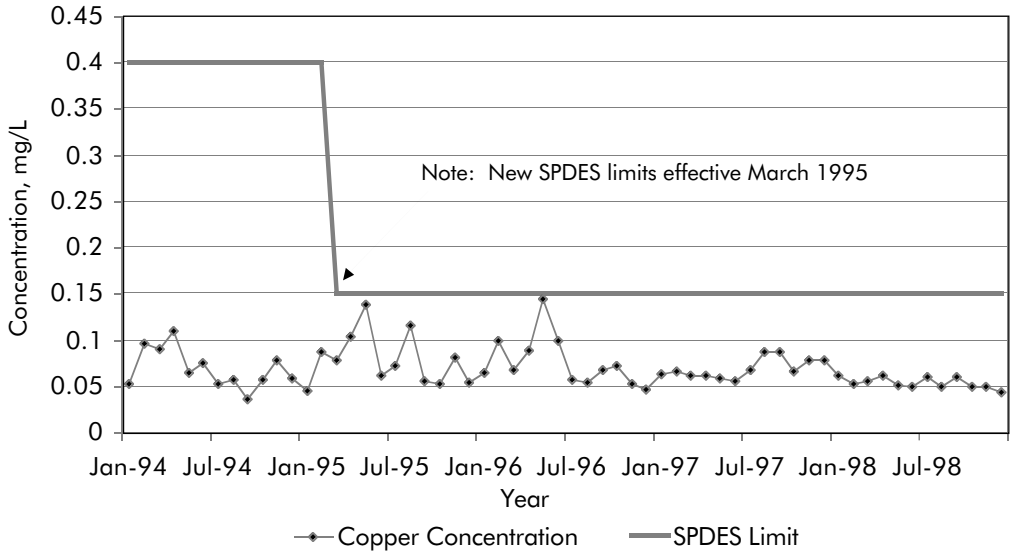

Figure 3-1. Maximum Concentration of Copper Discharged from BNL STP, 1994-1998

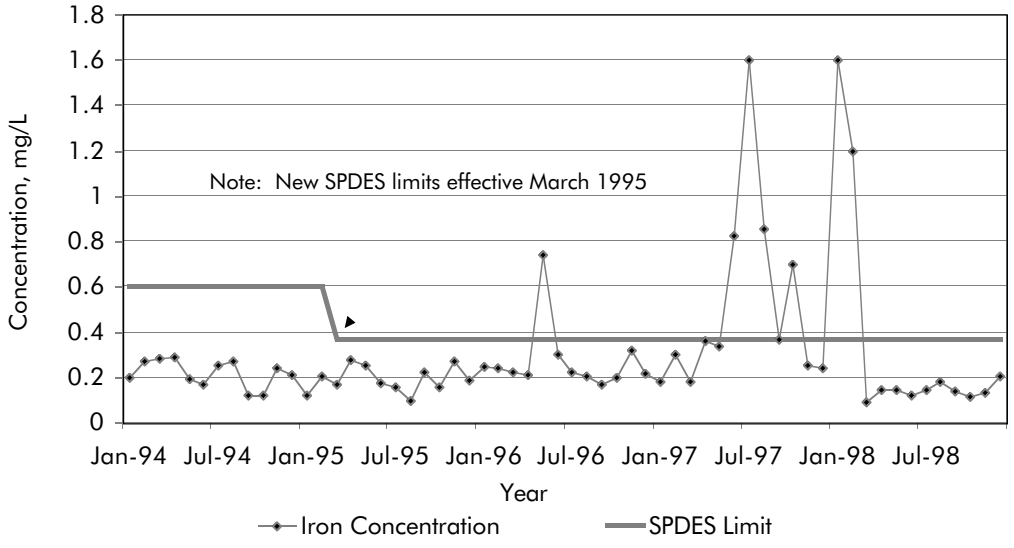

Figure 3-2. Maximum Concentration of Iron Discharged from BNL STP, 1994-1998

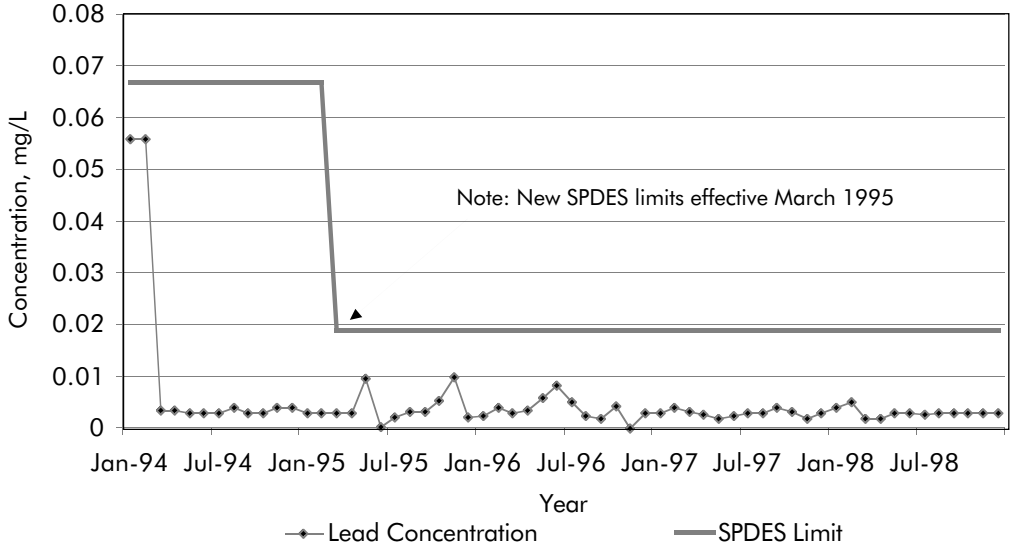

Figure 3-3. Maximum Concentration of Lead Discharged from BNL STP, 1994-1998

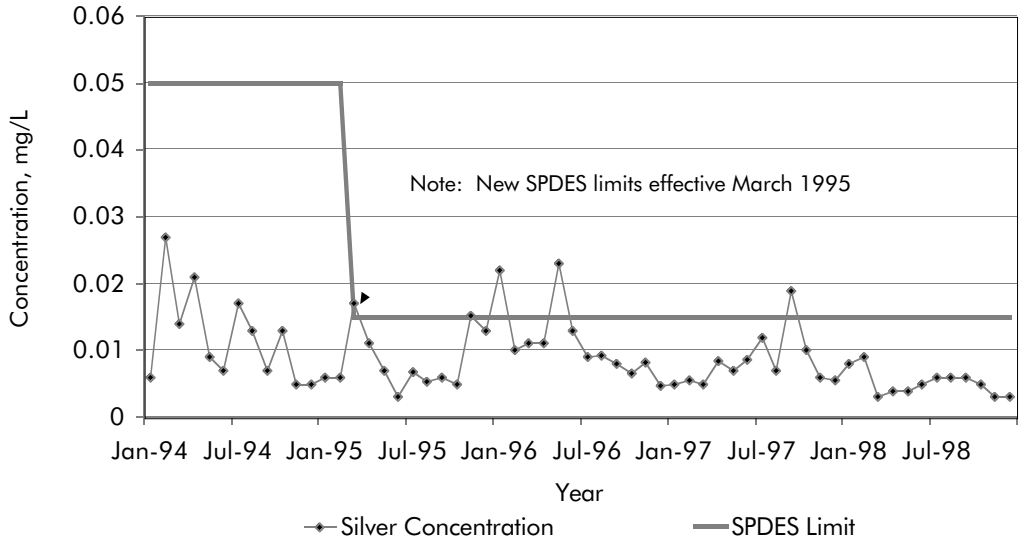

Figure 3-4. Maximum Concentration of Silver Discharged from BNL STP, 1994-1998

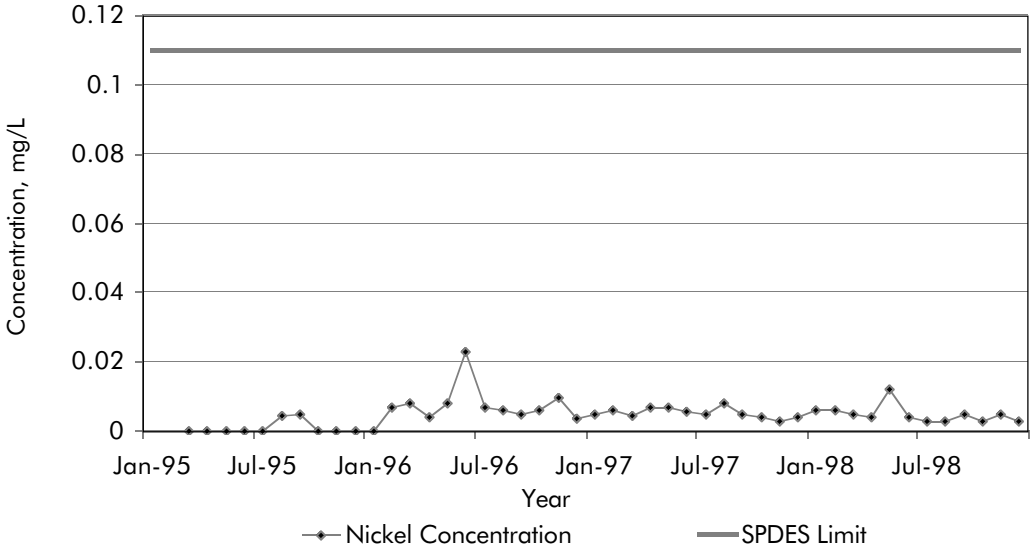

Figure 3-5. Maximum Concentration of Nickel Discharged from BNL STP, 1994-1998

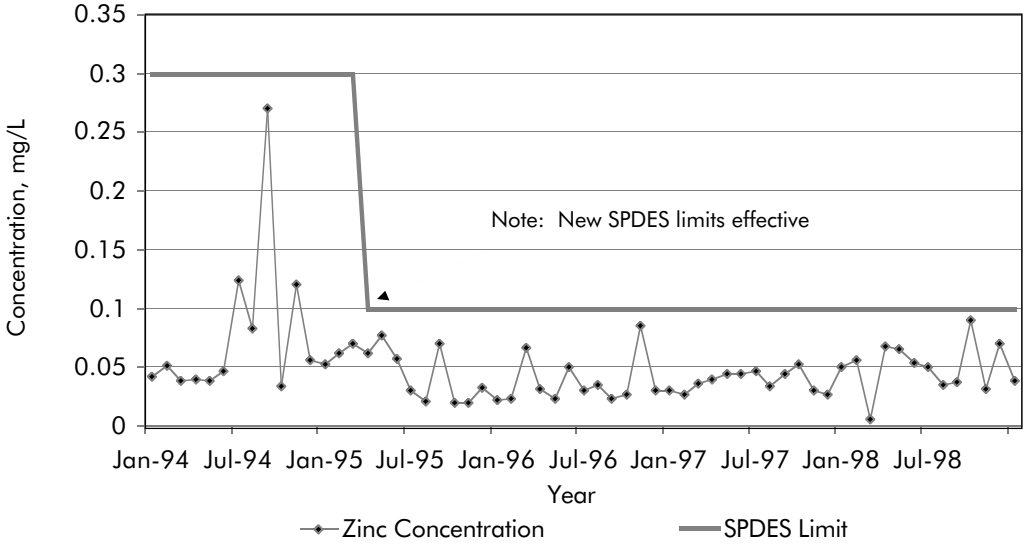

Figure 3-6. Maximum Concentration of Zinc Discharged from BNL STP, 1994-1998

testing. Sets of ten animals were exposed to varying concentrations of the STP effluent (i.e., 100, 50, 25, 12.5, and 6.25 percent) for seven days in each test. During the test, the size of fish and/or rate of reproduction for the water flea is measured and compared to untreated animals (i.e., controls). The test results were transmitted to the NYSDEC for review. Review of the toxicity data showed there was no acute toxicity exhibited for either organism, nor were any chronic effects such as changes in growth weight noted for the minnow. The rate of reproduction for the waterfleas raised in the pure STP effluent was, however, lower than the control group in two of the four tests. A "No Observable Effect Concentration" of 50 percent was reported for both tests. Due to the variability in the toxicity results, testing will continue through 1999.

3.6.2 BNL RECHARGE BASINS AND STORMWATER OUTFALLS 002 - 010

Outfalls 002 - 010 discharge to groundwater, replenishing the underlying aquifer. Monitoring requirements for each of these discharges vary, depending on the type of wastewater received and the type of cooling water treatment reagents used. Table 3-5 summarizes the monitoring requirements along with performance for 1998. During 1998, single event pH excursions at four of the recharge basins were the only exceedances for these discharges. Elevated pH in the BNL domestic water system was the primary contributing cause of these excursions. In 1997, a corrosion control study recommended that to minimize dissolution of lead from soldered joints, the pH of the BNL domestic water system should be maintained at 8.0 or higher. Difficulties in controlling the

Table 3-5.
Summary of Analytical Results for Waste Water Discharges to Outfalls 002 - 010[1]

Analyte		Outfall 002	Outfall 003	Outfall 004	Outfall 005	Outfall 006A	Outfall 006B	Outfall 007	Outfall 008	Outfall 010	SPDES Limit	No. of exceedances
Flow	N	CR	CR	CR	CR	CR	CR	CR	12	12		
MGD	Min.	0.16	0.8	0.02	0.025	0.067	0.05	0	0	0		
	Max.	0.38	2.5	1.4	0.35	0.22	0.29	0.2	1.05	0.92		
pH	Min.	6.6	6	5.8	6.8	6.8	6.8	6.8	5.8	7		
SU	Max.	8.3	8.8	6.4	8.4	8.6	8.9	9.0	8	8	8.5	4
Oil and	N	12	12	NR	12	12	12	NR	11	11		
Grease	Min.	< 5	< 5	NR	< 5	< 5	< 5	NR	< 5	< 5		
mg/L	Max.	< 5	< 5	NR	9.8	< 5	< 5	NR	5	< 5	15	0
Copper	N	NR	NR	NR	4	NR	NR	NR	NR	NR		
mg/L	Min.	NR	NR	NR	0.01	NR	NR	NR	NR	NR		
	Max.	NR	NR	NR	0.06	NR	NR	NR	NR	NR	1	0
Zinc	N	NR	4	NR	NR	NR	NR	NR	NR	NR		
mg/L	Min.	NR	0.008	NR	NR	NR	NR	NR	NR	NR		
	Max	NR	0.02	NR	NR	NR	NR	NR	NR	NR	5	0
Iron (total)	N	NR	NR	NR	NR	NR	NR	5	NR	NR		
mg/L	Min.	NR	NR	NR	NR	NR	NR	200	NR	NR	NA	0
	Max.	NR	NR	NR	NR	NR	NR	260	NR	NR		
Iron (dissolved)	N	NR	NR	NR	NR	NR	NR	5	NR	NR		
mg/L	Min.	NR	NR	NR	NR	NR	NR	0.047	NR	NR		
	Max.	NR	NR	NR	NR	NR	NR	2.54	NR	NR	NA	0

Notes:
CR: Continuous Recorder
NR: Analysis Is Not Required
NA: Not Applicable
SU: Standard Units

1. See Figure 4-1.

addition of caustic used to raise the pH, and the increased concentration of caustic in cooling-tower blowdown due to evaporative loss, were determined to be the root cause of pH excursions. To prevent future excursions, tighter controls on the addition of caustic have been imposed. In an effort to balance the recommendations of the corrosion control study and SPDES permit conformance, a permit modification was requested to raise the upper pH limit to 9.0. Since Long Island groundwater is naturally slightly acidic (pH = 5.5), the discharge of slightly alkaline wastewater would not have a detrimental impact on groundwater quality.

3.6.3 SAFE DRINKING WATER ACT (SDWA)

The distribution and supply of drinking water is regulated under the federal SDWA through 40 CFR Parts 141 - 143. In NYS, implementation of the SDWA is delegated to the NYS Department of Health and administered by the Suffolk County Department of Health Services (SCDHS). Since BNL provides potable water to more than 15 service connections, it must comply with the requirements for a public water supply. Monitoring requirements are prescribed annually by SCDHS and a Potable Water Sampling and Analysis Plan prepared to comply with these requirements. Containment is the desired method of protecting a public water system, and includes the installation of cross connection control devices at the interface between the facility and the domestic water main.

3.6.3.1 POTABLE WATER

BNL maintains six wells for the distribution of potable water. All wells are treated with activated carbon or air stripping to remove Volatile Organic Compounds (VOCs) to meet Drinking Water Standards. Three of those wells are also treated to reduce naturally occurring iron.

Tables 3-6 and 3-7 provide the potable water supply monitoring data for 1998. BNL monitors potable wells regularly for bacteria, inorganics, organics, and asbestos as required by Department of Health regulations. BNL also voluntarily monitors drinking water supplies for radiological contaminants. Examination of the table shows that color, iron and 1,1,1-trichloroethane (TCA) exceeded drinking water standards. Treatment via activated carbon or at the Water Treatment Plant (WTP) effectively reduced these contaminants to well below drinking water standards. At the point of consumption, all drinking water supplies complied fully with drinking water standards during 1998. Section 8.1.1 of Chapter 8 provides additional data on environmental surveillance testing done on potable wells which goes above and beyond SDWA testing requirements.

3.6.3.2 CROSS-CONNECTION CONTROL

The SDWA requires that public water suppliers implement practices to protect the public water supply from sanitary hazards, including connection of potable water supplies to systems containing hazardous substances (i.e., cross-connections). Such practices include the implementation of a rigorous cross-connection control program. Cross-connection control is the preferred method of protecting a public water system, and includes the installation of cross-connection control devices at the interface between the facility and the domestic water main. Installation of cross-connection control devices is required at all facilities where hazardous materials are used in a manner that could result in the introduction of these hazardous substances into the domestic water system under any condition. In addition, cross-connection controls at the point of use is also required to protect other users within a specific facility from hazards posed by other facility operations.

BNL installs and maintains over 150 cross-connection control devices at interfaces to the potable water main and secondary control devices at the point of use. Ninety-two cross-connection control units were tested in 1998. Any problems noted in these 92 units were immediately corrected, and devices were retested to ensure viability. Improvements are being implemented through the EMS to ensure that all devices onsite are tested annually, and that they conform with the applicable regulatory requirements.

3.6.3.3 UNDERGROUND INJECTION CONTROL

Underground Injection Control (UIC) is regulated under the SDWA. Proper management of UIC devices (drywells, cesspools, septic tanks and leaching fields) is critical to the

Table 3-6. Potable Water Wells and Potable Distribution System, Bacteriological, Inorganic Chemical and Radiological Analytical Data (1,2)

Compound	Well No. 4 (FD)	Well No. 6 (FF)	Wel No. 7 (FG)	Well No. 10 (FO)	Well No. 11 (FP)	Well No. 12 (FQ)	Potable Distribution Sample	NYS Drinking Water Standard	
Water Quality Indicators									
Total Coliform	ND	ND	ND	ND	ND	ND	ND	Negative	
Color	* 40	* 70	5	<5	<5	<5	5	15	Units
Odor	0	0	0	0	0	0	0	3	Units
Cyanide	<10	<10	<10	<10	<10	<10	<10	NS	µg/L
Conductivity	95	109	126	112	137	122	190	NS	µmhos
Chlorides	15.1	17.9	21	14	18.6	17.2	19.4	250	mg/L
Sulfates	7.1	9.7	11.5	10	13	10.4	11.6	250	mg/L
Nitrates	0.14	0.17	0.25	0.4	0.57	0.27	0.51	10	mg/L
Ammonia	0.04	0.03	0.02	<0.02	<0.02	<0.02	<0.02	NS	mg/L
pH	6.3	6.3	6.3	6.6	6.4	6.8	8.3	NS	SU
Methylene Blue Active Substances	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	NS	mg/L
Metals									
Antimony	<5.9	<5.9	<5.9	<5.9	<5.9	<5.9	<5.9	6.0	µg/L
Arsenic	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	50	µg/L
Barium	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	2.0	mg/L
Beryllium	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	4.0	mg/L
Cadmium	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	5.0	µg/L
Chromium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.1	mg/L
Fluoride	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	2.2	mg/L
Iron	*2.1	* 4.3	* 0.85	<0.02	<0.02	0.02	0.03	0.3	mg/L
Lead	2.9	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	15	µg/L
Manganese	0.28	0.15	0.02	<0.01	<0.01	<0.01	<0.01	0.3	mg/L
Mercury	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	2.0	µg/L
Nickel	<0.04	< 0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.1	mg/L
Selenium	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	10.0	µg/L
Sodium	8	10.5	13.6	9.7	12.7	12.8	21.8	NS	mg/L
Thallium	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	2.0	µg/L
Zinc	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	5.0	mg/L
Radioactivity									
Gross Alpha Activity	< 0.75	< 0.52	< 0.73	< 2.0	< 2.0	< 2.0	ANR	15.0	pCi/L
Beta	< 1.09	1.34	< 1.06	1.07	1.33	0.6	ANR	50.0	pCi/L
Tritium	< 309	< 335	< 33	417	< 372	353	ANR	20000.0	pCi/L
Strontium-90	< 1.6	< 1.1	< 1.1	< 1.3	< 1.2	< 1.7	< 1.8	8.0	pCi/L
Other									
Asbestos	ANR	ANR	ANR	ANR	ANR	ANR	< 0.19	7	M.Fibers/L
Calcium	ANR	ANR	ANR	ANR	ANR	ANR	9.1	NS	mg/L
Alkalinity	ANR	ANR	ANR	ANR	ANR	ANR	52.5	NS	mg/L

Notes:
1. This table contains the maximum concentration (minimum pH value) reported by the analytical laboratory.
2. See Figure 4-11.
*: Wells are treated at the WTP for color and iron reduction prior to site distribution.
NS: DWS Not Specified
ANR: Analysis Not Required
ND: Not Detected

protection of underground sources of drinking water. In New York, the UIC program is implemented through the USEPA, since the NYSDEC did not adopt the new UIC regulatory requirements. The NYSDEC had already implemented a similar program through its CWA initiative. Under the UIC program, all Class V injection wells must be included in an inventory maintained with the USEPA.

BNL has an inventory of approximately 120 active UICs. These are all classified as Class V Injection Wells consisting primarily of

Table 3-7. Potable Water Wells, Analytical Data for Principal Organic Compounds, and Micro-Extractables

Compound	WTP Effluent (F2)	Well No. 4 (FD)	Well No. 6 (FF)	Well No. 7 (FG)	Well No.10 (FO)	Well No. 11 (FP)	Well No. 12 (FQ)	NYS DWS
	µg/L							
Dichlorodifluoromethane	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
Chloromethane	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
Vinyl Chloride	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	2
Bromomethane	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
Chloroethane	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
Fluorotrichloromethane	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
1,1-dichloroethene	< MDL	< MDL	< MDL	< MDL	< MDL	0.7	< MDL	5
Dichloromethane	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
trans-1,2-dichloroethene	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
1,1-dichloroethane	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
cis-1,2-dichloroethene	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
2,2-dichloropropane	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
Bromochloromethane	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
1,1,1-trichloroethane	< MDL	8.4*	< MDL	< MDL	< MDL	4.2	< MDL	5
Carbon Tetrachloride	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
1,1-dichloropropene	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
1,2-dichloroethane	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
1,1,2-trichloroethane	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
1,2-dichloropropane	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
Dibromomethane	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
trans-1,3-dichloropropene	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
cis-1,3-dichloropropene	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
1,1,2-trichloroethane	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
Trihalomethanes	< MDL	0.8	< MDL	0.8	< MDL	< MDL	< MDL	100
1,1,2,2-tetrachloroethane	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
1,3-dichloropropane	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
Chlorobenzene	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
1,1,1,2-tetrachloroethane	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
Bromobenzene	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	< MDL	5
1,1,2,2-tetrachloroethane	ND	ND	ND	ND	ND	ND	ND	5
1,2,3-trichloropropane	ND	ND	ND	ND	ND	ND	ND	5
2-chlorotoluene	ND	ND	ND	ND	ND	ND	ND	5
4-chlorotoluene	ND	ND	ND	ND	ND	ND	ND	5
1,3-dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	5
1,4-dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	5
1,2-dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	5
1,2,4-trichlorobenzene	ND	ND	ND	ND	ND	ND	ND	5
Hexachlorobutadiene	ND	ND	ND	ND	ND	ND	ND	5
1,2,3-trichlorobenzene	ND	ND	ND	ND	ND	ND	ND	5
Benzene	ND	ND	ND	ND	ND	ND	ND	5
Toluene	ND	ND	ND	ND	ND	ND	ND	5
Ethylbenzene	ND	ND	ND	ND	ND	ND	ND	5
m-xylene	ND	ND	ND	ND	ND	ND	ND	5
p-xylene	ND	ND	ND	ND	ND	ND	ND	5
o-xylene	ND	ND	ND	ND	ND	ND	ND	5
Styrene	ND	ND	ND	ND	ND	ND	ND	5
Isopropylbenezene	ND	ND	ND	ND	ND	ND	ND	5
n-propylbenzene	ND	ND	ND	ND	ND	ND	ND	5
1,3,5-trimethylbenzene	ND	ND	ND	ND	ND	ND	ND	5
tert-butylbenzene	ND	ND	ND	ND	ND	ND	ND	5
1,2,4-trimethylbenzene	ND	ND	ND	ND	ND	ND	ND	5
sec-butylbenzene	ND	ND	ND	ND	ND	ND	ND	5
p-isopropyltoluene	ND	ND	ND	ND	ND	ND	ND	5
n-butylbenzene	ND	ND	ND	ND	ND	ND	ND	5
methyl tert. Butylether	ND	ND	ND	ND	ND	ND	ND	50

Notes:
Analysis for Synthetic Organic Compounds was not required in 1998.
< MDL: Less than the Minimum Detection Limit
*: Water obtained from wells 4, 6,and 7 is treated at the WTP prior to site distribution. The concentration of 1,1,1 trichloroethane in the WTP effluent (F2) met all drinking water standards.

stormwater drywells or small residential cesspools. In 1997, the USEPA cited BNL for not having a complete inventory of UICs. A complete inventory was submitted along with an area-wide permit application in December 1997. During 1998, there were no routine industrial discharges to UICs. BNL is planning to close approximately 58 UICs between 1999 and 2000.

3.7 SPILL PREVENTION, EMERGENCY PLANNING, AND REPORTING

Several federal, state, and local regulations involve the management of storage facilities containing chemicals, petroleum and other hazardous materials that are applicable to BNL. These regulations include specifications for storage facilities, release reporting requirements, and release planning document requirements.

3.7.1 SPILL PREVENTION CONTROL AND COUNTERMEASURES PLAN (SPCC)

BNL must maintain an SPCC Plan as a condition of its Major Petroleum Facility License and the Oil Pollution Act (40 CFR Part 112). This plan is part of BNL's emergency preparedness program and outlines mitigating or remedial actions that would be taken in the event of a petroleum release. The plan also provides information regarding the design of storage facilities, release prevention, and provides maps showing the location of all storage facilities. The SPCC plan was updated in 1998 to include response to chemical releases to meet the requirements of the Chemical Bulk Storage regulations (6NYCRR Part 598). The SPCC Plan is maintained on-file with the NYSDEC, USEPA, and the DOE. BNL demonstrated full compliance with the SPCC requirements in 1998.

3.7.2 EMERGENCY PLANNING AND COMMUNITY RIGHT TO KNOW ACT (EPCRA) AND SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT (SARA) TITLE III REPORTING REQUIREMENTS

Emergency Planning and Community Right to Know Act (EPCRA) and Title III of the Superfund Amendments Reauthorization Act (SARA) require reporting of inventories and releases to the Local Emergency Planning Committee and the State Emergency Response Commission for certain chemicals that exceed reporting thresholds. BNL fully complied with these requirements in 1998. BNL submitted the required reports under EPCRA Section 302-303, 304, 311-312. In 1998, there were no chemical releases that were subject to release reporting requirements under Section 313.

3.7.3 SPILL RESPONSE, REPORTABLE RELEASES AND OCCURRENCES

If a spill occurs, BNL personnel are required to immediately contact the onsite Fire Rescue Group. The Fire Rescue Group is trained in responding to releases of hazardous materials. The first step in a response would be to contain and control any release, and notify additional response personnel (BNL environmental professionals, industrial hygienists, etc.) The environmental professionals would assess the spill for environmental impact and determine reportability. Any release of petroleum products to soils or surface water is reportable to the NYSDEC and SCDHS. In addition, releases of petroleum products greater than five gallons to outdoor impermeable surfaces or containment areas are also reported. Spills of chemicals in quantities greater than Comprehensive Environmental Response, Compensation & Liability Act (CERCLA) Reportable Quantities (as specified in 40 CFR Part 302.4) are reportable to the National Response Center, NYSDEC, and SCDHS. Remediation of the spill is then conducted as appropriate. As an example, if a piece of heavy equipment ruptured a hydraulic line and there was a release of hydraulic oil to the soil, immediate actions would be taken to stop the leak, and then contaminated soils would be excavated and containerized for offsite disposal.

During 1998, there were 56 spills, of which only 14 met the external agency reporting criteria. Some of these spills were historical releases discovered during construction or other operations (i.e., the release did not necessarily occur in 1998). All spills were remediated to the satisfaction of the NYSDEC, and all contaminated residuals were collected, containerized and disposed. Table 3-8 provides information on the reportable spills, including the date of the spill, material involved, quantity, and includes a summary of the cause and remedial action taken. In addition, the table notes if the spill was reportable through the DOE Occurrence Report Processing System (ORPS). The remainder of the spills were small (typically less than a gallon), and were also immediately cleaned up.

Table 3-8. Summary of Chemical and Oil Spill Reports

Incident #, Date	Material	Quantity	ORPS* Report	Source/Cause; Corrective Actions
98-02 01/20/98	Hydraulic Fluid	< 1 gal.	Yes	Excavation equipment used for an Environmental Restoration job leaked hydraulic fluid. A plastic container was placed beneath the equipment to capture dripping product. The owner of the equipment, which was leased by BNL, repaired the leaking hydraulic hose that day. Contaminated soil was recovered and placed in a drum for offsite disposal.
98-05 1/31/98	Dimethyl Silicone	~ 10 gal.	Yes	A new silicon filled transformer developed a leak when placed into service 01/31/98. The unit was allowed to drain into two 55-gallon drums until the fluid level was below the leak point. There was minor spillage to the soil over the edge of the concrete support pad. All affected soil/gravel was containerized along with absorbent material.
98-06 02/5/98	Roof Coating	< 5 gals.	Yes	During transfer of construction debris into a roll off container, the driver of a front end loader observed a tar-like substance on the soil in the transfer area. Further investigation of the contents in the roll off container suggested that the material came from a five gallon container of Perma Primer™ roof coating that was apparently crushed during transfer activities. Spilled product, contaminated soil and absorbent materials used to prevent migration of product with stormwater runoff were recovered and containerized for offsite disposal.
98-11 02/24/98	Cooling Water	100 gals.	Yes	An outdoor cooling coil developed a leak due to freezing. The cooling water contained tritium at a concentration of 2.5E6 pCi/L. The water was released to a monitored point source discharge (Outfall 002). Monitoring of the discharge showed the effluent contained less than 2.5E3 pCi/L which is approximately 1/8 the of the drinking water standard. The coil was isolated and repaired.
98-13 02/25/98	Hydraulic fluid	~1 quart	Yes	A forklift leaked hydraulic fluid onto gravel in RHIC blockyard. A leaking tilt cylinder was the cause. An oil sheen was observed in shallow puddles following recent rain. Affected soil and gravel were containerized. The forklift was repaired.
98-19 03/30/97	Synthetic Compressor Oil	5 - 15 gal.	Yes	Compressor oil was released from a helium-oil separator on the south side of Bldg. 1005H. The fluid level sight-glass was broken, allowing a release to adjacent soil. Affected soil was removed and containerized for disposal.
98-26 05/19/98	Hydraulic fluid	1 - 2 gal.	Yes	A street sweeping vehicle developed a hydraulic line leak at the intersection of Upton Rd. and Brookhaven Ave. The vehicle came to rest near a storm grate, which was immediately diked off by F/R personnel. Little if any product was believed to have entered the grate. A small area of soil was affected. Absorbent pads and Dry-Zorb™ were applied to area and collected for disposal. The vehicle reservoir was allowed to drain in place (while catching additional product) and was towed to maintenance area for repair.

Table 3-8. Summary of Chemical and Oil Spill Reports *(cont'd.)*

Incident #, Date	Material	Quantity	ORPS* Report	Source/Cause; Corrective Actions
98-29 5/28/98	Process Oil	50 -60 gals.	Yes	While removing backfill material from the Smoke Study Control room associated with the old Bldg. 710 meteorological tower, the backhoe operator discovered oil leaking from an opening in a process tank that was lying on its side. It was estimated that 50 to 60 gallons of an unknown type of oil had leaked from the process tank. Miller Environmental was called in to oversee spill clean-up. The pooled oil and contaminated soil were recovered into drums for offsite disposal.
98-33 07/2/98	Gasoline/Motor Oil	~ 3 gallons	No	A motor vehicle accident occurred involving a sole motorcycle. Extensive damage to the motorcycle resulted in a release of approximately 3 gallons of gasoline and motor oil to the pavement and adjacent soils. Speedi-Dry™ was used to prevent further spillage to soils. All contaminated media was removed and containerized for offsite disposal.
98-41 8/28/98	No. 2 fuel oil	10 gal.	Yes	A contractor over filled a receiving tank with No. 2 fuel oil. The overfill resulted in a spill to the soil of approximately 10 gallons. Speedi-Dry™ was immediately applied to area for gross absorbtion, and the grounds crew containerized affected soil into 55-gallon drums for proper disposal.
98-46 09/29/98	Gasoline	~ 5 gals.	Yes	A contractor punctured the gasoline tank of his car when he backed into a metal stake protruding from the ground outside Bldg. 1008. Fire and Rescue personnel placed a plastic container under the vehicle to prevent further soil contamination as they raised the vehicle off the stake using a pneumatic jack. Approximately five cubic yards of gasoline-contaminated soil were excavated and transferred to a roll-off container for offsite disposal.
98-50 10/6/98	Transformer Oil	< 5 gallons	Yes	During inspection of Bldg. 1007W, an employee noticed oil within a floor drain. Investigation of the floor drain and associated piping using video equipment showed that oil had reached a drywell. Due to overburden, access to the drywell is limited. Remediation to date included removal of standing oil from the floor drain.
98-52 10/20/98	Compressor Oil	< 1/2 gal.	No	While transporting a tray of compressor oil to Bldg. 1005H, the technician dropped the tray, resulting in spillage to soil. Expeditious response limited the spread and quantity of contaminated media. All oil-containing soils were containerized for offsite disposal.
98-56 12/21/98	Diesel Fuel	< 1/2 gallon	No	During replacement of underground fuel oil piping at Building 912A, contaminated soils were discovered. All soils were excavated and placed into a 55-gallon drum for offsite disposal. A discreet source could not be located.

ORPS: Occurrence Reporting Processing System

In addition to the spills noted, there were three other incidents reported through ORPS that were environmental in nature. These included a violation of a Technical Safety Requirement at the Medical Research Reactor, a minor release of hydrogen chloride gas from a small "empty" lecture bottle inside a laboratory, and a continuous air-monitoring false alarm at Building 703. There were no onsite or offsite environmental consequences resulting from these incidents.

3.7.4 MAJOR PETROLEUM FACILITIES (MPF)

BNL is in full compliance with its MPF License requirements. The storage of 2.3 million gallons of petroleum products (principally No. 6 Fuel Oil) subjects BNL to licensing by the NYSDEC (6NYCRR Part 611 and Article 12 of the NYS Navigation Law). The current license was renewed in 1997. The license requires BNL to monitor groundwater in the vicinity of the seven active storage tanks (ranging in size from 60,000 to 600,000 gallons), which are all above-ground. Monitoring consists of monthly checks for floating product, and twice yearly tests for VOCs. No VOCs or floating products were found in the groundwater in 1998. (See Chapter 8 for additional information on groundwater monitoring results).

3.7.5 CHEMICAL BULK STORAGE

All underground tanks, and all aboveground tanks larger than 185 gallons, that store specific chemical substances listed in 6NYCRR Part 597 must be registered with the NYSDEC. In 1998, BNL had a total of nine registered tanks: seven above-ground tanks storing water treatment chemicals (for cooling towers, wastewater or potable water treatment) and two for storing gallium trichloride used in neutrino experiments. The tanks range in size from 475 to 2,000 gallons. As noted above, BNL upgraded the SPCC plan in 1998 to include response to chemical releases from these tanks. BNL is in full compliance with Bulk Storage requirements.

3.7.6 ARTICLE 12

Article 12 of the Suffolk County Sanitary Code, administered by the Suffolk County Department of Health Services (SCDHS) regulates the storage and handling of toxic and hazardous materials in above or underground storage tanks, drum storage facilities, piping systems, and transfer areas. It specifies design criteria to prevent environmental impacts resulting from spills or leaks. It also specifies administrative requirements, like labeling for identification purposes, registration and spill reporting procedures. In 1987, BNL entered into a Memorandum of Agreement with the SCDHS. In this agreement, the DOE and BNL committed to conform to the environmental requirements of Article 12.

There are 542 BNL storage facilities listed in the Suffolk County tanks database. This number includes CERCLA tanks that are not regulated under Article 12. The number also includes tanks that are empty or contain radioactive materials. The database lists active as well as inactive storage tanks and tanks of unknown status (e.g., whether removed or existing). Storage facilities listed in the database include facilities storing fuel (some of which are also regulated under the MPF), wastewater, chemicals and facilities needed to support radiological research.

As of the end of 1998, of the tanks listed in the Suffolk County data base, 13 fully conform with all Article 12 administrative, maintenance and technical requirements. Many of the other tanks require administrative corrective actions (e.g., corrected registrations, submittal of plans to SCDHS, proper labeling, etc.) or maintenance (e.g., replacement of light bulbs). Less than one-quarter of the facilities were found to be in technical non-conformance with Article 12 requirements (e.g. no secondary containment, high level detection etc.). BNL is working with SCDHS to determine the ultimate closure/status of an additional 62 storage facilities.

BNL is working towards achieving full conformance with the technical requirements of Article 12. BNL has an on-going program to upgrade and/or replace existing facilities to conform with these requirements. During 1998, 26 tanks were permanently removed and an additional 31 were upgraded to meet Article 12 technical standards. A new facility constructed at Building 811 provides containment for tankers handling radioactive waste and for portable waste treatment systems. Two new wastewater tanks were installed at Building 801 to replace two indoor tanks of suspect integ-

rity. At the HFBR, upgrades to the buried piping systems were approved and started.

In addition, plans and specifications were submitted to the SCDHS for the upgrade of 30 other storage facilities. These upgrades were in various stages of completeness during 1998. In its continuing commitment to attain conformance with Article 12, the Laboratory is seeking to extend funding for tank improvement projects to fully conform with the MOA requirements.

3.8 RESOURCE CONSERVATION AND RECOVERY ACT (RCRA)

The RCRA regulates wastes which are toxic, ignitable, reactive or corrosive (40 CFR 260-280, and 6NYCRR Parts 370-376). The regulations are designed to ensure that hazardous wastes are managed from "cradle to grave" in a manner that protects human health and safety and the environment. In New York, the RCRA program was delegated to the NYSDEC by USEPA, which still maintains an oversight role.

BNL is considered a large quantity generator, and also has a Treatment and Storage Facility final permit. As noted in Chapter 2, BNL has a number of 90 day storage and satellite accumulation areas. During 1998, BNL was not cited by NYSDEC or USEPA for violations of the hazardous waste requirements. Some compliance issues were noted during BNL internal assessments, and all were documented and promptly corrected.

3.8.1 RCRA/ TOXIC SUBSTANCES CONTROL ACT (TSCA) WASTE MORATORIUM

On May 17, 1991, DOE instituted a waste moratorium directing all their facilities to cease offsite shipments of RCRA/TSCA-regulated wastes that originated in radiologically controlled areas. To address this DOE-wide issue, BNL developed a DOE-approved waste certification program for all nonradioactive RCRA/TSCA wastes generated by BNL. The program uses process knowledge, analytical procedures and standard survey techniques to ensure RCRA/TSCA wastes shipped offsite to nonradioactive disposal facilities are free from radioactivity. Generators of waste are required to document and certify all results associated with the program. The moratorium was fully lifted by DOE in 1995, when BNL received final approval of its waste certification program.

3.8.2 FEDERAL FACILITIES COMPLIANCE ACT (FFCA) SITE TREATMENT PLAN FOR MIXED WASTE

Mixed wastes are wastes that are both hazardous (under RCRA) and radioactive. The FFCA issued in 1992 requires DOE to work with local regulators to develop a Site Treatment Plant to manage mixed waste. Development of the plan had two purposes: to identify available treatment technologies and disposal facilities (DOE or commercial) able to manage mixed waste produced at federal facilities; and to develop a schedule for treatment and disposal of these waste streams.

BNL updates its Site Treatment Plan annually and submits it to the NYSDEC. The update documents the current mixed waste inventory, and describes the efforts that BNL has undertaken to seek new commercial treatment and disposal outlets for various waste streams. One initiative that BNL has supported is DOE's Broad Spectrum Procurement. This initiative will help DOE facilities pool resources to assist in identifying potential mixed waste treatment and disposal outlets. Treatment and disposal outlets approved under the Broad Spectrum Procurement are available for use throughout the DOE complex.

3.9 TOXIC SUBSTANCE CONTROL ACT (TSCA)

The storage, handling and use of PCBs (Polychlorinated Biphenyls) are regulated under the Toxic Substances Control Act. All existing equipment containing PCBs must be inventoried, except small capacitors (less than 1.36 kilograms or 3 lbs) and items where the concentration of the PCB source material is less than 50 ppm. This inventory is updated by July 1st of each year. Capacitors manufactured prior to 1970 that are believed to be oil filled, but where the existence of PCBs can not be verified through an investigation of manufacturer's records, are handled as if they contain PCBs. All PCB articles and/or PCB-contaminated equipment must be labeled. BNL responds to any PCB spill in accordance with emergency response procedures. Several problems were detected during self-assessments, but as of the end of 1998, BNL was in full compliance with TSCA requirements.

3.10 FEDERAL INSECTICIDE FUNGICIDE AND RODENTICIDE ACT (FIFRA)

Pesticide storage and application is regulated under FIFRA. (Note: Pesticides include herbicides.) Most pesticides at BNL are used to control undesirable insects, mice and rats, to control bacteria in cooling towers, and to maintain certain areas (around fire hydrants, inside secondary containment berms) free of vegetation. Pesticides are also applied in agricultural research fields. Pesticide use is minimized wherever possible (e.g., through spot treatment of weeds). All pesticides are applied by NYS certified applicators. By February 1, each applicator files an annual report with the NYSDEC detailing pesticide use for the previous year. BNL is in full compliance with FIFRA requirements.

3.11 FLOODPLAINS/WETLANDS AND WILD AND SCENIC RECREATIONAL RIVERS AND OTHER SPECIAL PERMITS

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

Activities that could require review under these programs are identified during the NEPA process. 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 impact the area, or if it does, that the area will be restored to its original condition. When design is near completion, permit applications are filed. During and after construction, BNL must comply with the permit conditions.

Two activities were conducted in 1998 that required special permits. The first project was the construction of pumping stations for conveying sanitary waste and stormwater from RHIC facilities to the central collection system. In July, an application was submitted under the Long Island Wells permit program for dewatering in the RHIC area. Localized dewatering was necessary to permit construction of the pumping stations. This permit was issued and all pump stations installed in 1998. The second project involved the installation of a geomembrane and soil shielding at the RHIC ten o'clock station. This application was a request to renew a previously issued permit for RHIC construction. This permit was pending at the close of 1998.

During December of 1998, BNL experienced one incidence of noncompliance with these requirements. The request to renew a permit for construction in the northwest section of the Peconic River had been submitted to the NYSDEC in early December 1998. However, construction was initiated prior to receiving the renewal. As soon as this was realized, the work was immediately stopped, the DOE and NYSDEC were notified, and an investigation was initiated to determine the root cause of this problem. Construction will not be allowed to recommence until the renewed permit is received.

3.12 ENDANGERED SPECIES

One NYSDEC listed endangered species is found at BNL — the tiger salamander (Ambystoma tigrinum). Tiger salamanders are listed in NYS as endangered because populations have declined as a result of loss of habitat through development, road mortality during breeding migration, introduction of predatory fish into breeding sites, collection for bait and pet trade, water level fluctuations, pollution and general disturbance of breeding sites. BNL is preparing a Wildlife Management Plan to formalize the strategy and actions needed to protect the 13 confirmed tiger salamander breeding locations onsite. The strategy includes identifying and mapping habitats, monitoring, improving breeding sites, and controlling activities that could impact breeding.

The banded sunfish (Enneacanthus obesus) is also found in the Peconic River onsite at BNL. The banded sunfish has a "Special Concern" status within NYS. The reason for this status is that the only remaining population of the banded sunfish is located in eastern Long Island. Measures being taken by BNL to protect the banded sunfish and its habitat include:

- eliminating, reducing or controlling pollutant discharges,
- upgrading the STP to reduce nitrogen loading in the Peconic (completed in 1998),

- monitoring,
- maintaining adequate flow in the river and creating deep pools to enable the fish to survive drought,
- controlling disturbances, and
- culling predator species during sampling activities.

3.13 EXTERNAL AUDITS/OVERSIGHT

A number of federal, state and local agencies oversee BNL activities. BNL also has a comprehensive Self-Assessment program as described in Section 2.2.1.1of Chapter 2.

3.13.1 INSPECTIONS BY REGULATORY AGENCIES

In 1998, BNL was inspected by federal, state or local regulators on at least eight occasions. These inspections are summarized below.

Hazardous Waste

NYSDEC conducted a RCRA/hazardous waste compliance inspection in June-July 1998. No notification of noncompliance was received in 1998 as a result of this inspection .

Air Compliance

There were no air compliance inspections in 1998.

Potable Water

SCDHS conducts annual inspections of the BNL potable water system to collect samples and ensure that facilities are maintained. There were no findings, and all sample results were below Drinking Water Standards, except for iron, which is naturally occurring. As noted above in Section 3.7.1, BNL treats the drinking water supply prior to consumption to remove iron.

Sewage Treatment Plant (STP)

SCDHS conducts quarterly inspections of the BNL STPs. SCDHS deficiencies included finalization of an Operations Manual (completed in September), and a concern about the high-level alarm on the emergency generator (scheduled for repair in 1999).

NYSDEC was onsite July 8 evaluating Dissolved Oxygen levels at the STP and downstream in the Peconic in response to a fish kill at Donahue's Pond. Fish can suffocate when dissolved oxygen levels are too low. DEC found that dissolved oxygen levels were 16 times higher at the STP (8 ppm) compared to downstream offsite locations (0.5 ppm), indicating that the fish kill was not associated with BNL discharges.

3.13.2 DEPARTMENT OF ENERGY (DOE)

DOE staff from Headquarters, Chicago and the local Brookhaven Group (BHG) area office also oversee BNL activities. DOE-Headquarters conducted an Integrated Safety Management Assessment in 1998. The follow-up review focused on areas identified during the 1997 Integrated Safety Management evaluation as having significant weaknesses. They noted that BNL had made significant progress in work planning and control initiatives, and in groundwater protection and restoration activities. They also noted that DOE had taken a number of positive initiatives to improve oversight and assessment programs. Environmental Safety and Health and Operational documents were formalized to define the BHG oversight strategy and clarify roles and responsibilities. BHG had increased their presence and involvement in monitoring operations and conducted formal assessments of BNL

DOE-Chicago: In 1998, DOE-Chicago requested that Horne Engineering conduct an evaluation of the groundwater monitoring program at BNL. The report listed improvements needed in database integration, data validation, quality assurance documentation and procedures. All of these items had already been identified in BNL groundwater plans and were being addressed. DOE-Chicago also evaluated compliance with Title V and emergency planning for air releases for the CAA, and no compliance issues were identified. In late 1998, DOE Chicago also conducted an evaluation of the on-going EMS project, and made several recommendations for improvement.

DOE-BHG: DOE was in the process of strengthening their oversight program during 1998. An evaluation was conducted of CWA compliance, and no issues were identified. BHG also conducted a review of progress made in improving the NESHAPs compliance program, with several issues identified regarding confirmatory monitoring for small sources. BHG also evaluated the groundwater program.

3.13.3 ENFORCEMENT ACTIONS AND MOA'S

No new enforcement actions were issued to BNL in 1998. In 1997, USEPA proposed a Consent Order with a proposed penalty as a result of a multi-media compliance inspection conducted in 1997. Negotiations on the terms

of this Order continued in 1998. In 1997, USEPA had also issued a proposed Administrative Order on UIC compliance, and a Notice of Violation for CAA issues and TSCA violations. All USEPA requested information was submitted in 1997. There were no further activities related to these issues in 1998.

USEPA and DOE signed a voluntary Memorandum of Agreement (MOA) on March 23, 1998. (See Chapter 2 for a discussion of the MOA.) During 1998, BNL was in full compliance with the terms of the MOA.

All existing enforcement actions and Memorandums of Agreement are listed in Table 3-9, along with a summary of their status.

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

Number	Title	Parties	Effective Date	Status
Not Applicable	Federal Facilities Compliance Agreement (FFCA) on mixed waste	NYS DEC And DOE	1992	The FFCA requires that a Site Treatment Plan (STP), which a plan to manage mixed wastes, be written and updated annually. BNL is in compliance with this requirement.
Docket No. I-RCRA-98-0202	EPA Administrative Order (regarding compliance with RCRA requirements)	DOE and EPA	02/25/98	As a result of negotiations between EPA and BNL representatives, BNL agreed to conduct several Supplemental Environmental Projects (SEPs) to settle the complaint. Those SEPs were initiated in 1998.
Index No. 113-98-01	Compliance Order Clean Air Act	EPA and DOE	02/24/98	BNL, DOE and EPA met in May 1998 to review and clarify the issues presented in this order. Documentation necessary to support Laboratory operations was submitted to the USEPA prior to the issuance of the order. There was no further activity in 1998.
Not Applicable	Notice of Non-compliance (under TSCA)	EPA and DOE	02/12/98	All required information was submitted to EPA on 10/6/98; WMD will be implementing their revised Hazardous Waste Control Form in 1999.
Docket No. UIC-AO-98-01	Administrative Order on Consent - Safe Drinking Water Act	EPA and DOE	3/4/98 (date of receipt by DOE)	A meeting was held with the USEPA in May 1998 to review the Order, associated deliverables and an application for an Area Permit that was filed in December 1997. There were no further actions in 1998.
I-CERCLA-FFA-00201	Federal Facility Agreement under CERCLA Section 120 (Also known as the Interagency Agreement, or "IAG" on the Environmental Restoration program).	EPA, DOE, and NYS DEC	05/26/92	Provides the framework, which includes schedules, for assessing the extent of contamination and conducting the BNL clean-up. Work is performed either as an operable unit or removal action. The IAG integrates the requirements of CERCLA, RCRA, and NEPA. All IAG scheduled milestones were met in 1998.
Not Applicable	Suffolk County Agreement	SCDHS, DOE and BNL	Originally signed on 9/23/87	This Agreement was formalized to ensure that the storage and handling of toxic and hazardous materials at BNL is consistent with the technical requirements of the County Codes. The Agreement is being renegotiated to clarify and update the terms.
Not Applicable	Memorandum of Agreement (MOA) by and between the Environmental Protection Agency and the United States Department of Energy	EPA and DOE	03/23/98	BNL is currently in full compliance with the terms of the MOA. See Chapter 2 for further discussion.