Chapter 2

COMPLIANCE SUMMARY

It is the policy of BNL to operate and maintain the site in compliance with applicable federal, state, and local regulations and DOE Orders. This section briefly summarizes the compliance status for existing facilities and operations during CY 1997.

2.1 Environmental Permits

A variety of processes and facilities at BNL are subject to regulatory permits. They include one SPDES permit, a Major Petroleum Facility (MPF) license, two Resource Conservation Recovery Act (RCRA) permits (one for the existing Hazardous Waste Management Facility (HWMF); one for the new Waste Management Facility), a certificate from the NYSDEC registering tanks storing bulk quantities of hazardous substances, eight authorizations for the National Emission Standards for Hazardous Air Pollutants (NESHAPs), and 62 Certificates to Operate (CO) air emission sources from NYSDEC. Fifteen applications are pending with NYSDEC either for renewing or canceling existing COs, or obtaining COs for new air-emission sources. Table 2-1 gives information on the type and status of all environmental permits issued to the DOE through December 31, 1997.

In May 1996, NYSDEC renewed the permits for 25 sources. This action was taken to facilitate the Title V permit process. The remaining permitted sources are being evaluated by NYSDEC to determine whether they need to be included in the Laboratory's Title V permit either as exempt or trivial sources.

2.2 Groundwater Compliance Monitoring

Groundwater monitoring at the MPF and the Current Landfill is required by NYSDEC permit and Inter Agency Agreement (IAG)-approved monitoring plans, respectively. The results of the monitoring are provided in Chapter 8. The MPF currently operates under NYSDEC License No. 01-1700, and is monitored in accordance with the requirements listed in the License. Section 2.3.4 describes the results of CY 1997 compliance monitoring for the MPF.

Until December 1990, the Current Landfill was operated under NYSDEC Permit No. 52-S-20. Although the Current Landfill ceased operation in accordance with the Long Island Landfill Law, BNL continued to monitor the groundwater under the requirements specified in the permit until December 1995, when the extent of groundwater contamination in that area had been fully investigated and the landfill was capped. Since January 1996, groundwater has been monitored as part of a post-closure monitoring program specified in 6 NYCRR Part 360, Solid Waste Management Facilities (December 31, 1988). As required under the Current Landfill Operation and Maintenance Plan (CDM, 1996), BNL submitted the first annual Environmental Monitoring Report to the NYSDEC in 1997 (BNL, 1997). The second annual report (for CY 1997) will be submitted by July 1998. These groundwater data are summarized in Chapter 8, Groundwater Protection.

2.3 Clean Water Act

2.3.1 SPDES Permit

Sanitary waters, process-waste waters, and non-contact cooling waters discharged from BNL's operations are regulated by an SPDES permit issued by the NYSDEC. Specifically, effluents discharged to seven recharge basins, the Peconic River, and storm water emanating from the CSF are currently governed by the monitoring requirements and effluent limitations of the

Table 2-1
BNL Site Environmental Report for Calendar Year 1997
BNL Environmental Permits

Bldg./Facility Designation	Process Description	Permitting Agency and Division	Permit Number	Expiration Date
134	blueprint machine	NYSDEC-Air Quality	472200 3491 13401	11-29-97(5)
197	degreaser tank	NYSDEC-Air Quality	472200 3491 19702	02-01-98(5)
197	acid metal cleaning	NYSDEC-Air Quality	472200 3491 19703	03-22-96(5)
197	welding shop	NYSDEC-Air Quality	472200 3491 19704	04-01-00
197	cleaning room hoods	NYSDEC-Air Quality	472200 3491 19706	01-07-98(5)
197	cleaning room hoods	NYSDEC-Air Quality	472200 3491 19707	01-07-98(5)
197	epoxy coating/curing exhaust	NYSDEC-Air Quality	472200 3491 19708	06-08-98(6)
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
208	lead melting	NYSDEC-Air Quality	472200 3491 20801	11-29-97(5)
208	vapor degreaser	NYSDEC-Air Quality	472200 3491 20802	11-29-96(5)
208	sandblasting	NYSDEC-Air Quality	472200 3491 20803	11-29-96(5)
208	sandblasting	NYSDEC-Air Quality	472200 3491 20804	11-29-96(5)
244	cyclone collector	NYSDEC-Air Quality	472200 3491 24401	01-28-99(6)
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
444	incinerator	NYSDEC-Air Quality	472200 3491 44401	05-15-01(5)
458	paint spray booth	NYSDEC-Air Quality	472200 3491 45801	04-23-97(6)
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	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	09-30-9(6)
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				
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(6)
555	scrubber (1)	NYSDEC-Air Quality	472200 3491 55501	04-01-00
555	scrubber (2)	NYSDEC-Air Quality	472200 3491 55502	04-01-00
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	05-15-0
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)
650	scrap lead recycling	NYSDEC-Air Quality	472200 3491 65001	11-29-96(5)
650	shot blasting	NYSDEC-Air Quality	472200 3491 65002	11-29-96(5)
703	machining exhaust	NYSDEC-Air Quality	472200 3491 70301	05-15-01
705	building ventilation	U.S. EPA - NESHAPS	BNL-288-01	None

Table 2-1 (cont'd)

Bldg./Facility Designation	Process Description	Permitting Agency and Division	Permit Number	Expiration Date
820	accelerator test facility	U.S. EPA - NESHAPS	BNL-589-01	None
865	lead melting pot	NYSDEC Air Quality	472200 3491 86501	status pending
901	tin lead solder	NYSDEC-Air Quality	472200 3491 90101	04-01-00(5)
902	spray booth exhaust	NYSDEC-Air Quality	472200 3491 90201	09-30-98(6)
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/ solder exhaust	NYSDEC-Air Quality	472200 3491 90204	05-15-01
902	painting/ soldering exhaust	NYSDEC-Air Quality	472200 3491 90205	05-15-01
903	blueprint machine	NYSDEC-Air Quality	472200 3491 90301	11-29-96(5)
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(6)
905	vapor degreaser	NYSDEC-Air Quality	472200 3491 90501	03-22-96(5)
905	belt sander	NYSDEC-Air Quality	472200 3491 90502	06-18-95(5)
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(6)
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(6)
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
930	ultrasonic cleaner	NYSDEC-Air Quality	472200 3491 93003	02-01-97(5)
	spray aeration project	NYSDEC-Air Quality	submitted 10-89	status pending
AGS Booster	accelerator	U.S. EPA - NESHAPS	BNL-188-01	None
RHIC	accelerator	U.S. EPA - NESHAPS	BNL-389-01	None
	radiation therapy facility	U.S. EPA - NESHAPS	BNL-489-01	None
	radiation effects/neutral beam	U.S. EPA - NESHAPS	BNL-789-01	None
CSF(a)	major petroleum facility	NYSDEC-Water Quality	1-1700	03-31-02
STP(b) & RCB(c)	sewage plant & recharge basins	NYSDEC-Water Quality	NY-0005835	03-01-00
HWMF(d)	waste management	NYSDEC-Hazardous Waste	NYS ID No. 1-4722-00032/00021-0	08-31-98
WMF (e)	waste management	NYSDEC-Hazardous Waste	1-4722-00032/00102-0	07-12-05
BNL Site	chem tanks-HSBSRC	NYSDEC	1-000263	07-27-99

(a) Central Steam Facility
(b) Sewage Treatment Plant
(c) Recharge basins
(d) Hazardous Waste Management Facility
(e) New Waste Management Facility
HSBSRC = Hazardous Substance Bulk Storage Registration Certificate

***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.

(1) Renewal submitted 9-6-95, NYSDEC indicates source subject to registration only.

(2) Process not in service.

(3) Source with past due expiration dates are being evaluated by NYSDEC as possible exempt and trivial sources which would not need to be renewed pursuant to Part 201 provisions.

(4) Source currently out of service. If returned to service, an aqueous cleaning solution will be used in place of Freon 113 and methylene chloride to clean vacuum components.

(5) Source which have been removed or permanently decommissioned. A request will be submitted to the NYSDEC to have these sources removed from the Air Facility System database.

(6) Permit was renewed indefinitely on June 7, 1996, when revisions to the 6 NYCRR Part 201 - Permits and Registrations became effective.

SPDES permit. Deviations from the permit's limitations or monitoring requirements which occurred during 1997 are described subsequently in this chapter. Figure 2-1 shows the location of each outfall.

Several modifications were made to the Laboratory's SPDES permit in 1997, including implementation of the December 1996 permit changes and a formal permit change received in September. The December 1996 modifications involved adopting a Schedule of Compliance for improving the efficiency of Biochemical Oxygen Demand (BOD_5) and Total Suspended Solids (TSS) removal of the STP process, and the deferment of the 85% removal requirement. The Schedule of Compliance included implementing a reduction of non-contact cooling water which resulted in a 10 - 15% overall decrease in its contributions to the sewage-treatment plant. The schedule also included completing upgrades to the sewage-treatment plant and achieving final operational level by April 1998. While implementing both the reduction in non-contact cooling water and completion of the construction upgrades, the 85% BOD and TSS removal requirement was deferred. Compliance with the 85% removal will be reinstated in April 1998 upon achieving operational status of the STP modified process. The September modifications to the SPDES permit included adding mercury as a routine monitoring parameter for the STP discharge (Outfall 001) and undertaking a short-term high-intensity monitoring program for cadmium and polychlorinated biphenyls (PCBs). BNL met all scheduled milestones in both permit modifications which included completing of projects addressing non-contact cooling water reductions by December 31, 1997, and performing short-term high intensity monitoring by January 1998.

During negotiation of the SPDES permit, the NYSDEC deferred all radiological monitoring requirement to DOE Order 5400.5. Consequently, radiological parameters have not been reported as part of routine monitoring reports submitted to the NYSDEC. To document compliance with the DOE Order, daily, monthly or quarterly samples are collected from the various outfalls and analyzed for radiological parameters. These data are reported in Chapter 6.

2.3.2 Recharge Basins, SPDES Outfalls 002, 003, 004, 005, 006A, 006B, 007, 008, and 010

The Laboratory maintains seven recharge basins for the discharge of process-cooling waters, stormwater runoff, and, in the case of recharge basin HX (Outfall 007), water-filter backwash from the WTP. Cooling water is discharged to basins HN (Outfall 002), HO (Outfall 003), HP (Outfall 004), HS (Outfall 005), and HT (Outfalls 006A and 006B); storm water is discharged to basins HN, HO, HS, HT, HW (Outfall 0008) and the CSF (Outfall 010). The SPDES permit requires that BNL monitor these discharges monthly for flow, pH, and oil and grease, and quarterly for the numerous analytical parameters listed in Table 2-2. In addition, storm water discharged to Outfall 008 must be analyzed monthly for volatile organic compounds. There are no monitoring requirements for Outfall 009, which consists of numerous discharges to ground surfaces (e.g., air-compressor condensate, steam condensate, and miscellaneous residential cesspools).

Discharges of water to recharge basins are considered Class GA groundwater discharges and are regulated by the NYSDEC, as stipulated in 6 NYCRR Part 703.6; the discharge to the Peconic River is regulated in accordance with Class C ambient water quality criteria. Effluent limitations are dictated by the receiving water quality standard; consequently, in some cases, discharges to the Peconic River are more stringent than discharges to groundwater.

Table 2-2 summarizes the analytical results for outfalls 002-010 for 1997. There were three excursions from the SPDES permit at the recharge basins. In December 1997, a pH excursion to 9.3 was reported for Outfall 010 (SPDES limit = 8.5). Potential contributors included the application of hydro-seed mulch to the immediate area surrounding the stormwater catch basins, and construction of new storm water basins. Both hydro-seed mulch and fresh concrete contain excess lime, which raises the pH of water runoff. Reevaluation of the pH on January 7, 1998 showed it had resumed typical levels. All other pH values for this discharge

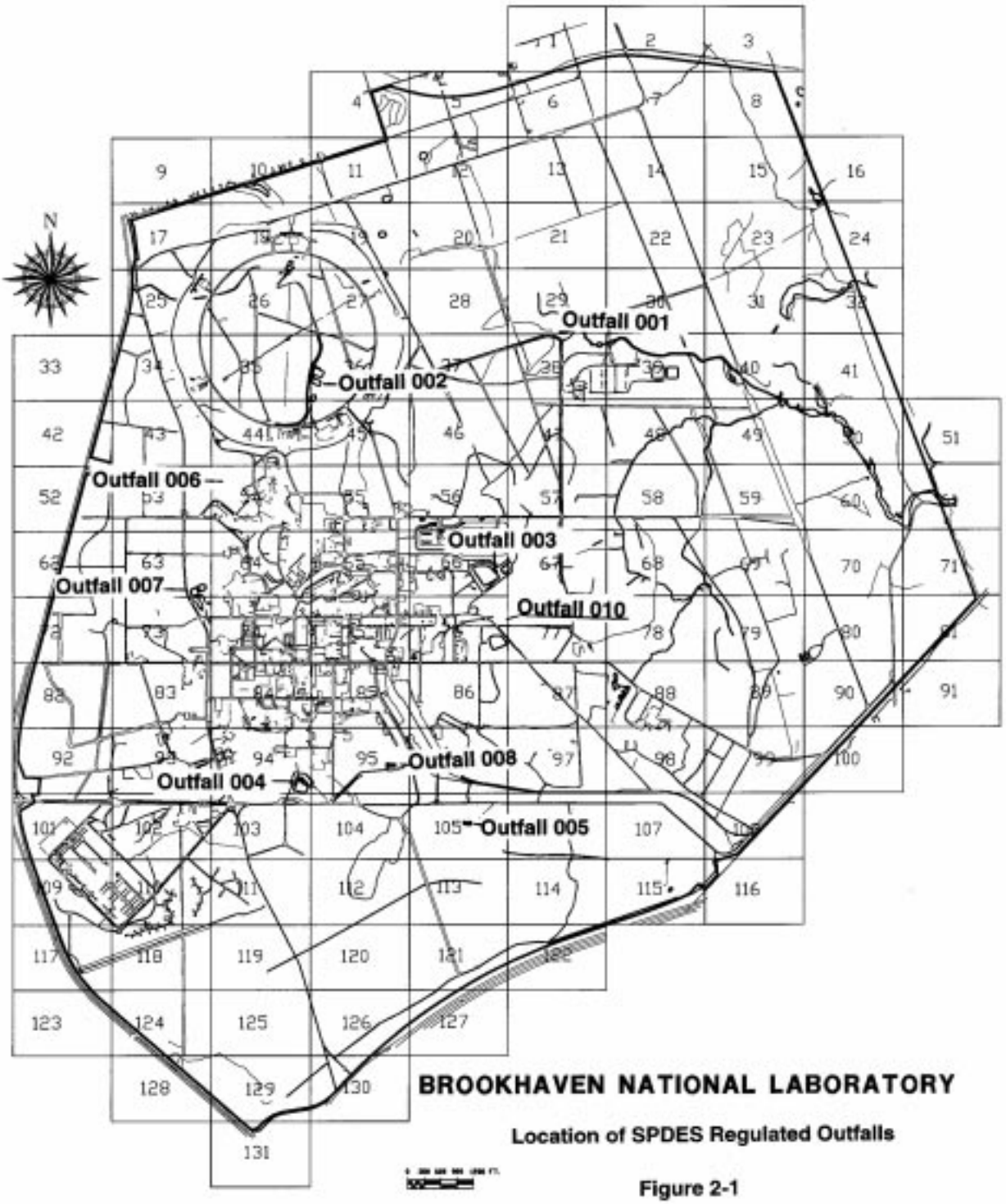
N
Outfall 001
Outfall 002
Outfall 003
Outfall 004
Outfall 005
Outfall 006
Outfall 007
Outfall 008
Outfall 010
BROOKHAVEN NATIONAL LABORATORY
Location of SPDES Regulated Outfalls

Figure 2-1

Table 2-2
BNL Site Environmental Report for Calendar Year 1997
Summary of Analytical Results for Waste Water Discharges to Outfalls 002 - 010

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	11	11		
MGD	Min.	0.05	0.35	0.006	0.042	0.03	0.006	NF	0.00018	0.0005		
	Max.	0.74	2.5	0.18	0.18	0.19	0.26	NF	1.439	0.242		
pH	Min.	6.2	5.7	5.65	6.3	6.7	6.8	NF	6.03	5.94		
SU	Max.	7.6	8.3	6.3	7.7	8.3	8.2	NF	7.9	9.3	8.5	1
Oil and Grease												
mg/L	N	12	12	NR	11	12	12	NR	12	12		
	Min.	ND	ND	NR	ND	ND	ND	NR	ND	ND		
	Max.	6.2	7.6	NR	6.3	5	ND	NR	5.3	ND	15	0
	Avg.	ND	ND	NR	ND	ND	ND	NR	ND	ND		
Copper	N	NR	NR	NR	4	NR	NR	NR	NR	NR		
mg/L	Min.	NR	NR	NR	0.012	NR	NR	NR	NR	NR		
	Max.	NR	NR	NR	0.025	NR	NR	NR	NR	NR	1	0
	Avg.	NR	NR	NR	0.019	NR	NR	NR	NR	NR		
Zinc	N	NR	4	NR	NR	NR	NR	NR	NR	NR		
mg/L	Min.	NR	0.002	NR	NR	NR	NR	NR	NR	NR		
	Max	NR	0.027	NR	NR	NR	NR	NR	NR	NR	5	0
	Avg.	NR	0.016	NR	NR	NR	NR	NR	NR	NR		
Iron (total)	N	NR	NR	NR	NR	NR	NR	0	NR	NR		
mg/L	Min.	NR	NR	NR	NR	NR	NR	NF	NR	NR	NA	0
	Max.	NR	NR	NR	NR	NR	NR	NF	NR	NR		
	Avg.	NR	NR	NR	NR	NR	NR	NF	NR	NR		
Iron (dissolved)												
	N	NR	NR	NR	NR	NR	NR	0	NR	NR		
	mg/L	Min.	NR	NR	NR	NR	NR	NR	NF	NR	NR	
	Max.	NR	NR	NR	NR	NR	NR	NF	NR	NR	NA	0
	Avg.	NR	NR	NR	NR	NR	NR	NF	NR	NR		
Chloroform	N	4	NR	NR	NR	NR	NR	NR	NR	NR		
ug/L	Min.	ND	NR	NR	NR	NR	NR	NR	NR	NR		
	Max.	2	NR	NR	NR	NR	NR	NR	NR	NR	7	0
	Avg.	ND	NR	NR	NR	NR	NR	NR	NR	NR		
Bromodichloromethane												
ug/L	N	4	NR	NR	NR	NR	NR	NR	NR	NR		
	Min.	ND	NR	NR	NR	NR	NR	NR	NR	NR		
	Max.	ND	NR	NR	NR	NR	NR	NR	NR	NR	5	0
	Avg	ND	NR	NR	NR	NR	NR	NR	NR	NR		
1,1,1-trichloroethane												
ug/L	N	4	4	4	NR	NR	NR	NR	12	NR		
	Min.	ND	ND	ND	NR	NR	NR	NR	ND	NR		
	Max.	ND	ND	ND	NR	NR	NR	NR	ND	NR	5	0
	Avg.	ND	ND	ND	NR	NR	NR	NR	ND	NR		
1,1-dicloroethylene												
ug/L	N	NR	NR	4	NR	NR	NR	NR	12	NR		
	Min.	NR	NR	NR	NR	NR	NR	NR	ND	NR		
	Max.	NR	NR	NR	NR	NR	NR	NR	ND	NR	5	0
	Avg.	NR	NR	NR	NR	NR	NR	NR	ND	NR		

Table 2-2 (cont'd.)

Analyte		Outfall 002	Outfall 003	Outfall 004	Outfall 005	Outfall 006A	Outfall 006B	Outfall 007	Outfall 008	Outfall 010	SPDES Limit	No. of exceedances
Dibromo-nitrilo-propionimide												
mg/L	N	NR	4	NR	NR	NR	NR	NR	NR	NR		
	Min.	NR	ND	NR	NR	NR	NR	NR	NR	NR		
	Max.	NR	ND	NR	NR	NR	NR	NR	NR	NR	0.1	0
	Avg.	NR	ND	NR	NR	NR	NR	NR	NR	NR		
Hydroxyethylidene-diphosphonic Acid												
mg/L	N	4	4	NR	4	4	4	NR	NR	NR		
	Min.	0.09	0.02	NR	0.02	0.02	0.04	NR	NR	NR		
	Max.	0.34	0.42	NR	0.5	2.15	0.4	NR	NR	NR	0.5	1
	Avg.	0.19	0.15	NR	0.25	0.69	0.16	NR	NR	NR		
Tolyltriazole	N	4	4	NR	4	4	4	NR	NR	NR		
mg/L	Min.	ND	ND	NR	ND	ND	ND	NR	NR	NR		
	Max.	ND	ND	NR	0.1	0.55	ND	NR	NR	NR	0.2	1
	Avg.	ND	ND	NR	0.074	ND	ND	NR	NR	NR		

Notes:
CR: Continuous Recorder
NR: Analysis Is Not Required
ND: Anayte Was Not Detected
NF: No flow recorded to Outfall 007 for the duration of 1997.

were well within effluent limitations. There were two other excursions, both at Outfall 006A on January 10, 1997. This recharge basin receives cooling tower blowdown from cooling systems located at Building 930. These systems are chemically treated to prevent corrosion of heat exchange surfaces and buildup of algae. Several of the treatment reagents are regulated under the monitoring requirements of the SPDES permit. Samples of the effluent collected on January 10, exhibited concentrations of hydroxyethylidene diphosphonic acid (2.15 mg/l) and tolyltriazole (0.55 mg/l) exceeding the SPDES effluent limits of 0.5 and 0.2 mg/L respectively. The former is used to prevent deposition of mineral scale, and the latter is used to prevent galvanic action between copper and steel. The cause was attributed to the over addition of Drewgard 187 to the cooling system. Reducing this to the lowest dose necessary to effectively treat the cooling tower reduced the elevated concentration of these chemicals. To curtail future excursions, an alternate cooling-tower treatment was proposed in December 1997. This treatment replaces both hydroxyethylidene diphosphonic acid and tolyltriazole with an inorganic phosphate and an acrylic polymer. Final approval of these materials is pending. All remaining parameters were within the limitations of the SPDES permit during CY 1997.

Outfall 007, which receives water-filter backwash from the WTP remained out of service during 1997 to permit continued major improvements to the WTP process. These improvements included building dual air-stripping towers for VOC abatement, and installing a new clear well and wet well. Former analog control systems were replaced with a computerized control system. The SCDHS inspected the WTP modifications several times during 1997 and approved the restart of this facility. The Laboratory is now refurbishing two of the three wells that supply water to the WTP. Consequently, it will not commence operations until these are completed, expected in the first quarter of 1998.

2.3.2.1 STP Effluent, SPDES Outfall 001

In accordance with the BNL SPDES permit, twenty-seven (27) parameters are reported in the monthly Discharge Monitoring Report (DMR) which is submitted to both the NYSDEC and SCDHS. In accordance with BNL's SOPs and QA protocols, BNL personnel collected the samples. Seventeen parameters including nitrogen, metals, organic, BOD_5, total suspended solids, fecal coliform, and cyanide are analyzed by NYSDOH-certified contractor laboratories. The remaining parameters (i.e., flow, settleable solids, residual chlorine, and pH) are recorded and analyzed by the STP operators. Table 2-3 summarizes the 1997 DMR analytical data for Outfall 001. They show that the SPDES permit discharge limit were exceeded six times at the STP effluent discharge point during 1997; once for ammonia nitrogen, four times for iron and once for silver.

On January 9, 1997, an ammonia concentration of 2.4 mg/L was recorded, which exceeded the permit level of 2.0 mg/L. This increase was attributed to decreased maintenance of the STP's sandfilters and to the cold weather. Lower temperatures and increased water retention on the sandfilters reduces the biological oxidation of ammonia, which increases the ammonia concentration and lowers the nitrate concentration in the effluent. Although the Laboratory tries to

Table 2-3
BNL Site Environmental Report for Calendar Year 1997
Summary of Analytical Results for Waste Water Discharges to Outfall 001

Analyte	Min.	Max.	Avg.	Monitoring Frequency	SPDES Limit	No. of Exceedances
Max. Temperature Degrees Farenheit	41	75	64	Daily	90	0
pH					Min.: 5.8	0
SU	6	6.8	NA	Cont. Recorder	Max.: 9.0	0
Avg. 5 day BOD mg/L	<4	3.5	2.6	Monthly	Avg.: 10	0
Max. 5 day BOD mg/L	<4	5	3	Monthly	Max.: 20	0
% BOD Removal	83	97	90	Monthly	85	0
Avg. Total Suspended Solids (TSS) mg/L	<4	5.1	4.3	Monthly	Avg.:10	0
Max. Total Suspended Solids (TSS) mg/L	<4	10.2	5.8	Monthly	Max.:20	0
% TSS Removal	86	>97	92	Monthly	85	0
Settleable Solids mg/L	0	0	0	Daily	0.1	0
Ammonia Nitrogen mg/L	0.03	2.4	0.95	Monthly	2	1
Total Nitrogen 2.5	11.8	6.35	Monthly	NA	NAmg/L	
Cyanide ug/L	<10	<10	< 10	Twice Monthly	100	0
Copper mg/L	0.0397	0.088	0.06	Monthly	0.15	0
Iron mg/L	0.104	1.57	0.382	Monthly	0.37	4
Lead mg/L	0.001	0.004	0.002	Monthly	0.015	0

Table 2-3 (cont'd)

Analyte	Min.	Max.	Avg.	Monitoring Frequency	SPDES Limit	No. of Exceedances
Nickel mg/L	0.002	0.0079	0.004	Monthly	0.11	0
Silver mg/L	0.003	0.018	0.007	Monthly	0.015	1
Zinc mg/L	0.02	0.052	0.035	Monthly	0.1	0
Toluene ug/L	<5	2	1.04	Twice Monthly	50	0
Methylene Chloride ug/L	<5	9	1.5	Twice Monthly	50	0
1,1,1-Trichloroethane ug/L	<5	1	1	Twice Monthly	50	0
2-Butanone ug/L	<5	2	1.04	Twice Monthly	50	0
Max. Flow MGD	0.68	0.962	0.79	Cont. Recorder	Max. 2.3	0
Avg. Flow MGD	0.542	0.722	0.619	Cont. Recorder	NA	0
Residual Chlorine (1) mg/L	0	0.04	0.03	Daily	0.1	0
Avg. Fecal Coliform MPN/100 ml	<2	26	26	Monthly	200	0
Max Fecal Coliform MPN/100 ml	<2	50	21	Monthly	400	0

Notes:
NA: Not Applicable
1. Chlorination was discontinued in September 1997.

enhance the biological activity of the sandfilters by routinely rotating and aerating the soils by discing, the frequency of discing is reduced during cold-weather months because the soils are frozen. After rotating the filters, an analysis of the effluent samples collected on January 13 showed the concentration to be in compliance.

There were exceedances of iron and silver in 1997. The excursions of iron occurred in June, July, August and October. Such exceedances have occurred intermittently since beginning the construction of improvements to the sewage-treatment plant. During the summer and early fall of 1997, improvements of the sewage-treatment plant included installing new manholes and interconnecting piping, building the new pump station, and installing the new ultraviolet (UV) disinfection system. These activities interrupted the normal flow of sewage through the plant, and most likely contributed to increased iron concentrations in STP effluent. Modifications to the primary clarifier effluent-chamber to accommodate the new pump station required pumping wastewater from the clarifier to the filter -bed dosing chambers. This effectively reduced the settling characteristics of the primary clarifier and reduced the efficiency of solids separation. Removing the chlorine-contact chamber from service also removed a final settling stage and altered the hydraulic profile of the STP by eliminating the final resistance to flow. Reduced primary clarification, loss of final settling, and alteration to the plant hydraulics are all contributing causes to increased iron concentrations and corresponding increases in suspended solids. To evaluate the effects of the slight increase in suspended solids due to reduced separation, iron concentration was plotted against suspended solids; there is a clear correlation between these factors (Figure 2-2). Upon completing the STP improvements, the iron concentration in the effluent fell to below SPDES limits.

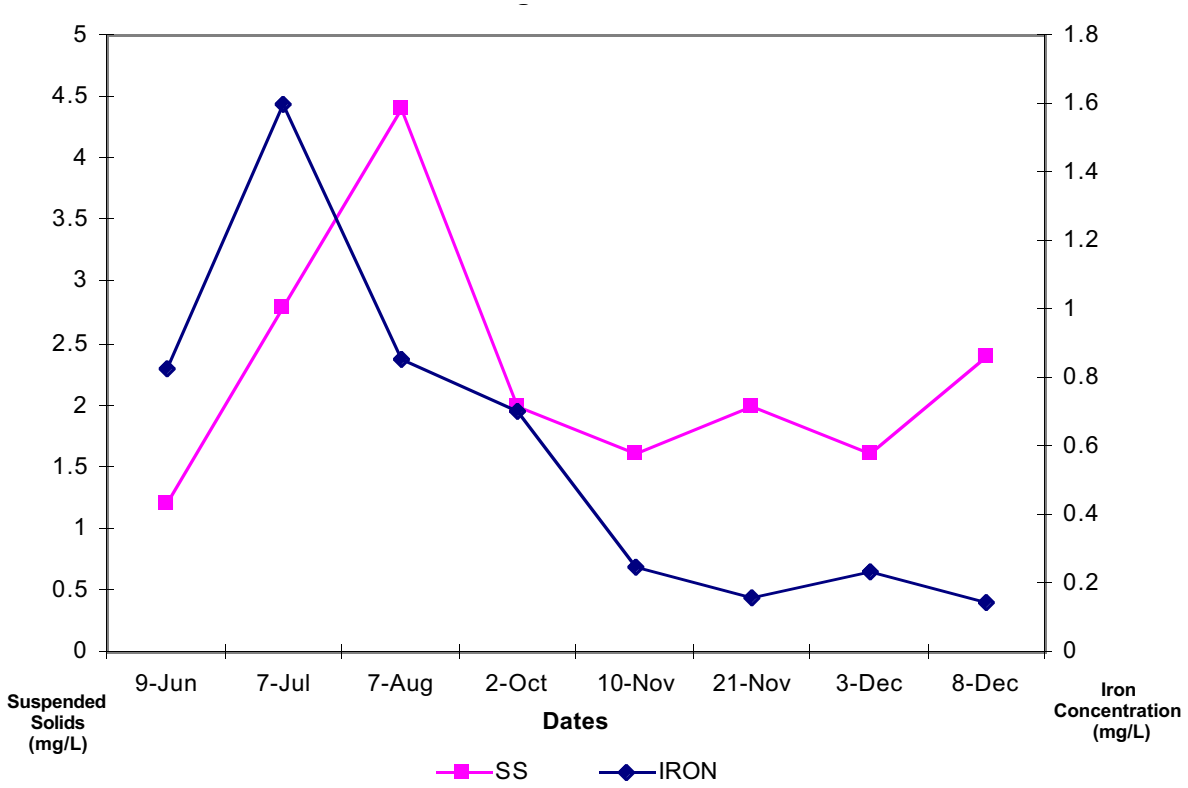

Figure 2-2. Effluent Concentration of Iron and Suspended Solids Discharge from BNL STP 1997

On September 5, 1997, the concentration of silver (0.018 mg/L) in the STP discharge exceeded the permit limit of 0.015 mg/L; this was also attributed to upgrading the STP and increased concentrations of suspended solids in the discharge. Samples collected on September 8, 1997 showed that silver was within permitted levels.

In addition to monitoring the point-source discharges, the Laboratory also is required to monitor and report effluent concentrations for process-wastes discharged to the STP. This program includes quarterly monitoring of photo-developing waste waters generated at Buildings 197 and 118, and rinse-waters from plating and metal-cleaning operations at Buildings 535 and 197, respectively. These discharges are monitored for pollutants specific to these operations. The pollutants include metallic elements, semi-volatile and volatile organic compounds, phenols, and cyanides. Flow and pH also are monitored. In addition, discharges of boiler blowdown from satellite boilers, and discharges from Building 902's cooling-tower are analyzed quarterly for flow and pH.

The analytical data for 1997 show these discharges were insignificant contributors to the STP collection system. As part of a pollution-prevention initiative, the former Acid Cleaning Facility (ACF) in Building 197 was replaced by the Centralized Cleaning Facility, located in Building 498. The new facility, which became fully operational in mid 1997, replaces the harsh cleaning chemistry formerly used at the ACF (hydrofluoric-nitric and phosphoric-acid, and sodium hydroxide) with the environmentally conscientious alternatives, mild-borate and polyphosphate -inorganic compounds and citric acid. While chemical analysis of the concentrated wash baths show the waste cannot be discharged into the sewer due to elevated metals concentrations, the wastes are nonhazardous and can be cost-effectively managed on-site. The new process was evaluated by Brookhaven personnel working in conjunction with Dow Chemical, Advanced Cleaning Systems Division. This effort earned a DOE Pollution Prevention Award in 1996.

The biomonitoring program specified in the SPDES permit is a Chronic Tier II Test using fathead minnows (*Pimephales promelas*) and water fleas (*Ceriodaphnia dubia*) as the test organisms. Chronic toxicity is assessed by exposing the organisms to varying concentrations (i.e., 100%, 50%, 25%, 12.5% and 6.25%) of the STP effluent for seven days and monitoring their survival, growth, and rate of reproduction. The data are compared to a control group. The SPDES permit requires several rounds of toxicity testing, with all data reviewed by the NYSDEC. Toxicity testing completed in 1996 showed the STP discharge exceeded the Maximum Allowable Waste Concentration calculated for this round of tests. Due to significant upgrades to the STP, the NYSDEC deferred further testing until all upgrades were completed in September. Then, a new round of toxicity testing commenced with the first samples collected in December 1997. The results showed a "No Observable Adverse Effective Concentration" of 50%. Testing will be continued for three additional quarters in 1998. Some concern was raised about starting these tests so close to the start-up of the new treatment process since there was not the necessary biomass needed to sustain the process. This caveat will be considered during a review of the analytical results. In an effort to identify the contributors to the exhibited toxicity, the Laboratory continued to conduct full-scale chemical analysis of aliquot samples during toxicity testing. These tests proved inconclusive; the analytical results were almost identical for samples which elicit a toxic response and those which do not. Copies of the analytical results for all toxicity tests were provided to the NYSDEC and the SCDHS.

2.3.2.2 SPDES Inspections and Audits

Until January 1993, the SCDHS made quarterly inspections of the STP. Due to reduced funding for monitoring and inspecting local sewage-treatment plants, inspections were not conducted by the SCDHS in CY 1997. Their quarterly inspections of the STP are expected to resume in 1998, based upon preliminary notification.

In May 1997 the EPA conducted a "Multimedia Audit" of the Laboratory's environmental compliance programs. The SPDES program was evaluated as part of it. During the inspection comments were made about the permitting of a stormwater discharge emanating from the former Waste Management facility. The Laboratory had previously reviewed this issue with both the NYSDEC and EPA and concluded that a permit was not required. However, upon EPA's recommendation, a permit was filed and is pending with the NYSDEC. There were no other issues identified during EPA's review.

2.3.2.3 National Pollution Discharges Elimination System (NPDES) Analytical Quality Assurance

The Laboratory participates in the NPDES Laboratory Performance Evaluation Program administered by the EPA. In May 1997, notification for participation in the USEPA DMR Quality Assurance Program, Study 17 was transmitted to the USEPA designee. Proficiency-check samples were forwarded by the EPA designee to the laboratories listed below for subsequent analysis. The respective analytical parameters determined by each Laboratory are listed below:

Name and Address	**Analytical Parameters**
H2M Labs Inc. Melville, NY	Copper, Lead, Iron, Nickel, Zinc, Mercury, BOD_5, Total Suspended Solids, Ammonia-N, Nitrate-N Total Kjeldahl Nitrogen, Cyanides, Oil and Grease Phenolics.
BNL STP Operations Laboratory Upton, NY	pH, Total Residual Chlorine
Cosper Environmental Inc. Bohemia, NY	Tier II Chronic Toxicity

The analytical data from the proficiency-check samples were sent to the EPA-designated facility by the individual laboratories in October 1997. All the results were acceptable. However, for 1996 Study 16, a single unacceptable result for BOD was reported. According to the contractor laboratory responsible for the analysis (NYTEST Environmental) an error was made in diluting the sample, resulting in under reporting the amount present.

2.3.3 Major Petroleum Facility (MPF)

The BNL CSF supplies steam for heating and cooling to all major areas of the Laboratory through an underground distribution system. The MPF, the storage area for the fuels used at the CSF, operates under license (No. 01-1700) issued by the NYSDEC. The current license was issued by NYSDEC on April 7, 1997, and expires on March 31, 2002.

The NYSDEC is required by Article 12 of the Navigation Law to protect and preserve the lands and waters of NYS from all discharges of petroleum, and specifically, from major petroleum storage facilities. To fulfill this responsibility, all major petroleum storage facilities are required to be registered with the NYSDEC and must have a license to operate. The license is contingent on several conditions including groundwater monitoring, periodic submittal of engineering evaluations and reports for secondary containment systems, and updates to Facility Response Plans and Spill Prevention Control and Counter Measures (SPCC) Plans.

All major petroleum storage facilities are required to install groundwater monitoring wells. The license has general conditions which include monthly testing of monitoring wells for floating products and semiannual testing for dissolved products. Typically, the facility owner can test for floating products, however, testing for dissolved products must be performed by an NYSDOH-certified laboratory.

Five groundwater wells, one upgradient and four downgradient, are used for monitoring regulatory compliance of the MPF. The well authorized for use by the NYSDEC as upgradient of the MPF is designated Well 76-25, and is located immediately upgradient (within 50 feet) of the former above-grade storage tanks 611A and 611B. The four downgradient wells are designated 76-16, 76-17, 76-18, and 76-19. Figure 8-8 shows their locations. The 4-inch diameter well-casings are constructed of polyvinyl chloride (PVC); they have 20-feet long PVC screens which straddle the water table.

In accordance with conditions of the MPF license, samples were collected for regulatory compliance from these wells twice during 1997 and submitted to a NYSDOH-certified laboratory. The NYSDEC required that these analyses included polynuclear aromatics and base-neutral extractable compounds listed in EPA Method 625. The analytical results were transmitted to the NYSDEC in accordance with the MPF permit requirements. These wells were also monitored monthly for floating products; none were found during CY 1997.

In addition to the compliance samples, these wells also were monitored twice during CY 1997 as part of BNL's routine EM program; the analytical results are discussed in Chapter 8.

The MPF license also requires that a Spill Prevention Control and Counter-Measures (SPCC) Plan is maintained and updated at least triennially. A copy of the updated Plan was filed with the NYSDEC on December 27, 1996. Its format and content were reviewed by the USEPA during a May 1997 multimedia audit. The deficiencies included failure to follow EPA's format, and an inadequate discussion of potential environmental release pathways. The SPCC Plan was again updated and reformatted to comply with EPA's directive, and submitted to the EPA and the NYSDEC in December 1997.

A facility-improvement project was implemented in 1995 to bring all tanks and fuel-handling facilities associated with the MPF into compliance with county-and state-regulations for petroleum storage facilities. This project included coating the internal tank bottoms with epoxy on

four tanks, installing double bottoms on two tanks, upgrading above-and underground-piping systems, and building a fuel off-loading facility. Copies of plans and specifications were sent to the SCDHS and the NYSDEC for review and comments. As stipulated in the 1996 MPF License, construction of the fuel off-loading facility was finished by December 31, 1996. Demolition of MPF Tanks 611A and 611B was completed in January 1997. Soil samples collected from the base area of these tanks showed only trace concentrations of semi-volatile organic compounds. Their presence most probably was due to rust inhibitors originally applied to the base of the tanks. The secondary containment berms for these tanks were regraded, and the tank areas filled to restore the natural ground elevation.

2.3.3.1 Spill Prevention, Control, and Countermeasures Plan and Facility Response Plans

Brookhaven National Laboratory has had a SPCC Plan since the early 1980s with a complete list of all oil storage tanks, their capacity and building numbers. In the mid 1980s, direction from NYSDEC removed all but those storage tanks associated with the MPF and the Motor Pool Fuel Storage area (Building 326) in the SPCC listing. This Plan was revised in 1982, 1983, 1985, 1987, 1990, 1993, 1996, and 1997. All revisions were submitted to the NYSDEC and EPA.

As a direct result of the disaster of the Exxon Valdez, the American Trader, and other accidents, Congress enacted the Oil Pollution Act of 1990 (OPA-90). This Act significantly modified many provisions of the Clean Water Act (CWA). One requirement is that facility owners and operators must prepare plans outlining their response capability to a "Worst Case Discharge (WCD)" which is defined as the " . . . largest foreseeable discharge in adverse weather conditions." These terms were described in the legislative history to mean " . . . a case that is worse than either the largest spill to date or the maximum probable spill for the facility type." The way in which a facility expects to respond to the WCD must be outlined in a Facility Response Plan (FRP), together with information about the oil-recovery capabilities of the facility and any associated Oil Spill Response Organizations contracted by that facility.

BNL's FRP was originally prepared in 1993, and in accordance with comments and guidance received by EPA, revised and resubmitted in 1994 and 1995. The EPA allotted a five-year review period for commenting on the revised FRPs. No further guidance on the content of the FRP nor comment to the FRP was received from the EPA during 1997.

2.3.4 Oil and Chemical Spills

BNL's policy is to provide prompt and accurate notification of unexpected environmental releases of oil or chemicals as required by Federal, State, and local regulations. Anyone discovering a release must immediately report it using BNL's emergency telephone number. This number is monitored continuously by BNL's Police Group and the ES&HS Fire Rescue Group. The latter group is the Laboratory's first responder. They assess the situation, and take measures for control and containment, while other specialists such as industrial hygienists and environmental compliance personnel, provide additional support.

During 1997, there were 68 incidents involving a minor release of oil or chemicals. Table 2-4 summarizes these incidents, giving the date each occurred, the material involved the amount released, and a brief explanation of the corrective actions taken. Twenty-six of these incidents required EPA, NYSDEC, and SCDHS notifications. These spills were cleaned up, and the contaminated absorbent and affected soil were sent off-site for approved disposal. All reportable instances were for release of petroleum products to soil. The remainder involved very small quantities of material which were typically contained on asphalt, concrete, or other impervious surfaces. Clean-up procedures were undertaken and there were no environmental impacts from these occurrences. Off-site regulatory agencies are notified based upon the type, quantity, and location of material spilled. Release of petroleum products that are known to be less than five gallons, contained or under the control of the responsible party, have not and will not reach soils and groundwater,

and are cleaned up within two hours of discovery are not reportable to the NYSDEC. All releases to soils and surface water are reported, irrespective of the volume of release.

Releases of hazardous substance in quantities equal to, or greater than, their reportable quantity must be reported to the National Response Center under the requirements of Comprehensive Environmental Response, Compensation & Liability Act (CERCLA). Such releases also must be reported to the NYSDEC, as mandated in the NY Navigation Law and Chemical release reports (6 NYCRR parts 595), and to the SCDHS, as specified in the Suffolk County Sanitary Code (SCSC). **During 1997 there were no releases of hazardous substances which exceeded CERCLA reportable quantities.**

2.4 Clean Air Act

2.4.1 Conventional Air Pollutants

During 1997, a variety of BNL emission sources were evaluated with respect to NYS and Federal permitting requirements. The applicable regulations for these sources are Title 6 Chapter III Parts 200 to 257 of the Codes, Rules and Regulations of the State of New York, and the Federal Clean Air Act (CAA). The sources reviewed and their current statuses are summarized below.

No. of Actions	Status/Comments
1	In February 1997, an equivalency application was submitted to the NYSDEC Bureau of Eastern Remedial Action in Albany for an air stripper designed to remove volatile organic compounds from contaminated groundwater in Operable Unit III. BNL received confirmation that the application was approved in June 1997.
1	In March 1997, following the receipt of acceptable stack test results for particulate emissions, an application for a certificate to operate Boiler 7 was submitted to the NYSDEC. Copies of the emissions-test report for particulates completed in December 1996 and revised calculations accompanied the application, which supported the laboratory's position that the requirements for preventing significant deterioration were not applicable. The NYSDEC subsequently issued a permit in December 1997 to operate the boiler.
1	In July 1997, an equivalency application was submitted to the NYSDEC Bureau of Eastern Remedial Action in Albany for the air-sparge and soil vapor-extraction system that removes volatile organic compounds from contaminated soil in Operable Unit IV. The application was approved in October 1997.
1	In July 1997, the laboratory informed the USEPA and the NYSDEC that an extension of a LILCO natural-gas main into the CSF was completed, and that Boilers 5, 6 and 7 were being equipped with dual-firing capabilities that would burn either natural gas or oil. Since the changes made to the boilers to accommodate the combustion of natural gas did not increase emissions regulated under 40 CFR Subpart Db and 6 NYCRR Part 227-2, modifications to the permits issued for each boiler were not required.
1	In November 1997, a permit to construct and a certificate to operate application was submitted to the NYSDEC regional office for a lead- melting pot to process old lead shielding in Building 865 of the new Waste Management Facility.
1	The laboratory submitted its Title V Phase I application to the NYSDEC in December 1997. The application summarized the regulatory requirements applicable to BNL's emission sources, described laboratory operations and activities which are subject to federal and state regulatory requirements, and summarized the pollutants released by BNL's sources. The application also included a compliance plan that addressed three noncompliance situations that were identified during its preparation and a statement certifying that BNL will continue to comply with all other applicable requirements.

Table 2-4
BNL Site Environmental Report for Calendar Year 1997
Summary of Chemical and Oil Spill Reporting Record

Number	Date	Material	Quantity	Rpt*	Source/Cause; Corrective Actions
97-01	1/8/97	crankcase oil/engine coolant	~ 1 gal	No	Spillage occurred due to damage to a contractor's pick-up truck after he drove over a fence post. All spillage was contained to the roadway. Absorbent material was used to clear the spill.
97-02	1/21/97	Deionizing effluent	10-15 gals.	No	Waste water from ion exchange column resins leaked from an outside storage tank onto the concrete. The effluent froze, which prevented migration to the storm drains. Containers were placed under the leak to catch further leakage. The effluent was transferred into another tank.
97-03	2/4/97	Gasoline	<2 pint	No	The Fire/Rescue vehicle developed a gas leak. All spillage was to the asphalt. Speedy dry was applied to the spill and all contaminated absorbent remove promptly. The vehicle was taken to the service station for repair.
97-04	2/7/97	No. 6/No. 2 Fuel Oil and Water	~ 50 gals.		During the demolition of BNL Tanks 611A and 611B, Number 2 fuel oil was used to clean residual oil from the bottom of the tanks. The contaminated material (i.e., soils, piping etc.) was stored in lined and covered 20-yard dumpsters. During transport of these dumpsters, one of the rear hatches became loose resulting in spillage to the ground. All spillage was recovered using spill absorbents and heavy equipment. Contaminated materials were transferred to covered dumpsters for off-site disposal.
97-05	2/18/97	Hydraulic fluid	1-2 pints	No	Absorbent material was used to control a leaking valve on a trailer. The contractor fixed the leaking valve and removed the absorbent material on the trailer for off-site disposal.
97-06	2/20/97	Motor Oil	~ 1 quart	No	A leaking one-gallon container that was used to recover motor oil during oil changes was placed in a pail and speedy-dry was used to absorb the oil. The absorbent material and oil were re-covered for offsite disposal.
97-07	2/26/97	Lubricating Oil	< 2 gals.	Yes	While an attempt was being made to blowdown compressor filter oil into a holding tank a fine mist of helium and lubricating oil sprayed vertically into the air. Absorbent pads were used to clean the thin layer of oil that had coated several compressor tanks. The absorbent pads and contaminated soil were removed for disposal.
97-08	2/27/97	Ethylene Glycol	2 gals	No	A ruptured radiator on a portable generator released its contents onto the asphalt. There was no contact with the soil. Absorbent material was used to clean up and was disposed properly.
97-09	3/10/97	Vacuum pump oil	< 1 quart	Yes	Oil from a vacuum pump spilled on the gravel drive/walk way. The contaminated gravel and materials that were used to clean up were carted away for off-site disposal.
97-10	3/11/97	Battery Acid	1 cup	No	A new battery was cracked and its contents leaked onto the cement loading dock. Powdered neutralizing agent was applied. The contaminated material and battery were disposed of through the hazardous waste collection system.
97-11	3/14/97	Diesel Fuel	< 35 gals.	Yes	The fitting between the hose and pump in a portable fuel tanker came loose and caused a spill of oil along a stretch of heavy roadway. The rain complicated cleanup. Absorbent booms and pads were used as the main controls for the entire clean up process. The road was sanded to minimize the driving hazard of oil slick. The contaminated soil and sand were removed and properly disposed.
97-12	3/15/97	Oil containing PCBs	20-30 gals.	Yes	Dri-zorb and absorbent pads were used to control the release of oil from a klystron that tipped over. The affected areas were cleaned with a degreasing agent. Chemical analysis showed the oil to contain PCBs @231ppm. The spill was cleaned in accordance with EPA requirements.

Table 2-4 (cont'd.)

Number	Date	Material	Quantity	Rpt*	Source/Cause; Corrective Actions
97-13	3/17/97	Motor oil	5 quarts	No	A lab vehicle leaked motor oil. Absorbent material was applied and the spilled product was collected for disposal.
97-14	3/19/97	Dielectric fluid containing PCBs	< 1 pint	Yes	A capacitor in a klystron modulator unit ruptured releasing dielectric fluid. The spill was contained in the steel cabinet in which the capacitor was mounted. Material was sampled and cleaned up using PCB clean-up procedures. All cleaning materials were drummed for disposal as PCB-contaminated waste.
97-15	4/3/97	Transmission Fluid	< 2 liters	No	Transmission fluid leaked from a private vehicle onto the pavement. Speedy-dry was used to absorb the spilled product. The absorbent material was recovered for off-site disposal.
97-16	4/4/97	Ethylene Glycol	~ 1 pint	No	A spill of glycol was discovered on the asphalt outside building 490 loading dock. Spill absorbent material was applied and recovered for proper disposal.
97-17	4/7/97	Motor Oil	~2 gal.	No	Engine oil leaked from a fuel truck. Speedy dry and absorbent pads were used to absorb the spilled product. The absorbent material was recovered for off-site disposal.
97-18	4/7/97	Alkaline Cleaner	~ 25 gals.	Yes	A spigot on a 55-gallon drum that contained Clean J-1 alkalin cleaner failed and caused a spill. The spilled material pooled into the bermed containment area. Neutracit neutralizing agent was added to the spill to neutralize it. The neutralized material was recovered and placed in drums for off-site disposal.
97-19	4/21/97	Pine Sap	Unknown	Yes	The leachate that collected in a depression near some tree stumps had distinct oil like sheen. Because the oily substance had the appearance of a petroleum product, the discovery was reported to off-site agencies. However, it was deduced that the oily leachate was pinesap and not of a petroleum product. NYSDEC Spills Unit later confirmed this conclusion.
97-20	4/23/97	Dielectric Fluid	< 8 gals.	Yes	Non-PCB dielectric fluid leaked from a transformer onto a concrete pad. Absorbent pads were used to clean oil stained surfaces of the concrete pad. Oil stained ballast material and soil around the perimeter of the transformer was removed and drummed for disposal.
97-21A	4/23/97	Hydraulic Oil	< 1 quart	Yes	A hydraulic line on a front-end loader developed a pin hole leak. A bucket was placed under the leaking line. The contaminated soil was recovered and transferred to a 55-gallon drum for disposal. The leaking hose was replaced.
97-21	4/29/97	Contact cement	< 0.5 gal.	No	A can of contact cement fell from the rear of a transport vehicle and some of the contents were spilled to the road surface. Absorbent material was then applied and material was placed back in the can, which was then disposed.
97-22	5/5/97	Transmission fluid	~ 1 quart	Yes	Mechanical failure caused truck transmission fluid to be lost to soil. Absorbent pads were applied and the affected soil areas were shoveled out for proper disposal.
97-23	5/8/97	Transformer Oil	< 1 quart	No	Non-PCB oil was discovered seeping from a transformer unit. Spill absorbent was applied to intercept additional leakage. Inspection of the rock ballast showed minimal oil contamination. Contaminated absorbent and rock ballast was collected for proper disposal.
97-24	5/9/97	Hydraulic Oil	~ 2 gals.	Yes	Plastic sheeting was used to contain a leak from a backhoe. The vehicle was repaired and all contaminated soils and plastic were recovered for off-site disposal.
97-25	5/14-97	Vacuum Pump Oil	<2 pint	No	A small quantity of vacuum pump oil spilled while draining the pump prior to disposal. The spill was contained on asphalt and was mitigated using sand and other spill absorbents.
97-26	5/15/97	Transformer Oil	< 1 gal.	Yes	Oil contaminated soil was discovered in the Building 912B transformer yard. Impact to soil was negligible. Non-PCB contaminated soil and rock ballast was collected for off-site disposal.
97-27	5/15/97	Transformer Oil	< 1 gal.	Yes	Oil contaminated soil was discovered in the Building 901 transformer yard. Impact to soil was negligible. Non-PCB contaminated soil and rock ballast was collected for off-site disposal.
97-28	5/16/97	Compressor Oil	< 1 pint	No	A compressor leaked oil onto the pavement. Speedy dry was used swept up and placed into plastic bags for off-site disposal.

Table 2 - 4 (cont'd)

Number	Date	Material	Quantity	Rpt*	Source/Cause; Corrective Actions
97-29	5/16/97	Deionizing Effluent	~ 10 gals.	No	Wastewater from AGS operations was discovered leaking from pavement. Drums were placed beneath the leaking compartment to capture the leaking material. Water absorbent pads and speedy-dry were used to recover wastewater that had spilled onto the ground. The remaining liquid within the leaking compartment (2200 -2500 gals.) was pumped into another compartment of the tanker, a 1000-gallon tank supplied by Waste Management and twenty-one 55-gallon drums.
97-29	5/16/97	Deionizing Effluent	~ 10 gals.	No	Wastewater from AGS operations was discovered leaking from one compartment on an outside storage tank onto the asphalt pavement. Drums were placed beneath the leaking compartment to capture the leaking material. Water absorbent pads and speedy-dry were used to recover wastewater that had spilled onto the ground. The remaining liquid within the leaking compartment (2200 -2500 gals.) was pumped into another compartment of the tanker, a 1000-gallon tank supplied by Waste Management and twenty-one 55-gallon drums.
97-30	5/20/97	Hydraulic Oil	2 gals.	Yes	A tractor-trailer leaked hydraulic fluid onto local soils and standing water that remained from a recent rain event. Spill absorbent pads were applied to mitigate the floating oil and once the water subsided, the contaminated soil was excavated for disposal.
97-31	5/30/97	No. 2 Oil	1 quart	Yes	During an inspection of the containment area around Tank No. 5, a leak from a drain tap nipple was discovered. Because the spill was to the containment area and did not reach soil, the spill was reportable only to Suffolk County Department of Health Services pursuant to Article 12 requirements. The oil stained ballast material was recovered for off-site disposal.
97-32	6/4/97	Hydraulic Oil	< 1 pint	No	Hydraulic fluid leaked from a workers vehicle that was parked in the road west of Bldg. 496A. Absorbent rags were placed beneath the leak to capture the fluid. The residual fluid that leaked onto the asphalt pavement was cleaned with absorbent materials and placed into a 55gallon drum for disposal.
97-33 GLS	6/5/97	Mineral Oil	< 1 gal.	Yes	Relief valve failed on air conditioner compressor outside of child-care center. Refrigerant mixed with mineral oil was released. Absorbent applied to accessible areas while bushes, shrubs and gravel were dug up and containerized.
97-34	6/4/97	Hydraulic Oil	< 1 gal.	Yes	A contracted drill rig developed a hydraulic leak. The fluid sprayed onto the soil under the vehicle. All contaminated soil was excavated and placed into a 55-gallon drum for off-site disposal.
97-35	6/9/97	Compressor Oil	< 1 quart	No	A portable air compressor developed a leak. Absorbent material was used to clean up the spill. All contaminated absorbent was contained for off-site disposal.
97-36	6/11/97	Hydraulic Oil	<2 gal.	Yes	A pay loader developed a hydraulic leak. The equipment was immediately shutdown thereby limiting the amount of spillage. Contaminated soils were removed and placed into a 55-gallon drum for off-site disposal.
97-37	6/20/97	Automotive Fuel	<1 quart	No	Due to loose fittings, fuel leaked from F/R Group brush truck. Spill occurred to pavement and was cleaned up with speedy-dry.
97-38	6/24/97	Hydraulic Oil	1 ounce	No	A forklift spilled oil due to a leak from an o-ring seal on a hydraulic line solenoid valve. Oil absorbent pads were placed beneath the unit to capture any dripping fluid. The company that owns the forklift was contacted and would replace the defective seal on June 25.
97-39	6/27/97	Asphalt Primer	~1 quart	No	A can of asphalt primer leaked from the back of a maintenance truck onto a paved area. Absorbent material was applied to the spill. Recovered material was placed back into original container.
97-40	6/27/97	Transformer Oil	Unknown	Yes	During excavation to install a secondary containment berm around the transformer yard to the south of Bldg. 463, the contractor uncovered what appeared to be petroleum-contaminated soil. Screening of the headspace above the stained soils with a TVA-1000 Photo Ionization / Flame Ionization Detector provided no evidence of contamination. To insure that the soil was not contaminated, soil samples were collected for off-site analysis for semi-volatiles and PCBs. Analytical results showed no evidence of contamination.

Table 2-4 (cont'd.)

Number	Date	Material	Quantity	Rpt*	Source/Cause; Corrective Actions
97-41	7/2/97	Lacquer Thinner	1 quart	No	A five gallon container of lacquer thinner was accidentally punctured by a forklift. It was quickly placed onto a safety storage pallet to capture the leaking fluid. The leaking container was then placed into an overpak and absorbent material was used to clean up the product that had leaked onto the floor. The leaking container and contaminated absorbent materials were disposed of as hazardous wastes.
97-42	7/2/97	Gasoline	< 1 gal.	No	Gasoline leaked from a parked vehicle over filled tank. Absorbent material was used to cleanup the spill. The contaminated absorbent material was recovered for off-site disposal.
97-43	7/7/97	Hydraulic Fluid	100 ml.	Yes	Hydraulic fluid leaked onto the ground when an o-ring seal on a Grove Manlift failed while the vehicle was being used in the waste pit remediation area. Absorbent pads were place beneath the vehicle. The contaminated soil was then shoveled into a five-gallon pail for off-site disposal.
97-44	7/14/97	Hydraulic Oil	4 - 5 gals.	No	A boom truck hydraulic line ruptured resulting in spillage to the pavement. All oil was contained on asphalt surfaces and was cleaned-up using spill absorbent.
97-45	7/21/97	Carbonaceous Silicide	< 1 gal.	No	North of Former Landfill.
97-46	7/23/97	Sodium Hypochlorite	< 1 pint	No	While being transported a container of Sodium Hypochlorite fell and spilled a part of its contents onto the road. Fire rescue and S&EP were alerted. The Sodium Hypochlorite was diluted with water allowed to run into the storm drain and then into the STP for discharge. No other clean up activity was necessary.
97-47	7/26/97	Hydraulic Oil	0.5 - 1 gal.	Yes	One of the hydraulic lines of a crane developed a leak. A plastic wading pool was placed beneath the crane to intercept additional spillage and the crane was repaired. All contaminated soil was collected for off-site disposal.
97-48	8/1/97	Mercury	3-5 pounds	Yes	Metallic mercury was encountered in the crawl space beneath the Building 197 high bay. The discernible mercury was subsequently removed and soil samples were collected to determine impact. Results show elevated residual mercury levels. Further actions are planned for continued remediation under the Facility Review Project and CERCLA Program.
97-49	8/8/97	Compressor Oil	4 - 5 gals.	No	During dismantling of a defunct refrigeration system oil spilled on the floor. Speedy-dry and other absorbents were used to remediate the spill. All contaminated absorbent was collected for proper disposal.
97-50A	8/15/97	Hydraulic Fluid	< 1 gal.	Yes	Hydraulic fluid leaked onto the ground when a hydraulic line seal failed on a front-end loader. The contaminated soil was recovered and was placed in a five-gallon pail for disposal. The vehicle was subsequently transported to the Heavy Equipment Shop for repairs.
97-50B	8/18/97	Hydraulic Fluid	1 pint	Yes	Refer to Spill 97-50A
97-51	8/15/97	Engine Oil	< 1 quart	No	A leak was observed beneath a contractor >s truck. A tarp was placed beneath the leak to capture dripping fluid and absorbent material was applied to stained areas of pavement. Contaminated absorbent materials and the tarp were containerized for disposal. The leak was repaired before continuing with the job.
97-52	8/25/97	Vacuum Oil	< 1 gal.	No	A seal failed on a vacuum pump and leaked oil onto the concrete. Speedy-dry and absorbent pads were used to clean up the spill. The absorbent materials were containerized for off-site disposal. The failed seal was replaced.
97-53	8/27/97	Unknown Petroleum	Unknown	Yes	During installation of utility poles, oil contaminated soils (odors only) were encountered. A soil sample was collected for subsequent chemical analysis to confirm this observation. Chemical analysis revealed no evidence of Petroleum contamination.
97-54	9/15/97	Power Steering Fluid	< 1 pint	No	Power steering fluid leaked from a pump truck. Absorbent materials were placed beneath the leak and onto stained areas of the asphalt pavement. The absorbent materials were recovered for off-site disposal.

Table 2-4 (cont'd.)

Number	Date	Material	Quantity	Rpt*	Source/Cause; Corrective Actions
97-55	9/23/97	Antifreeze	~1 quart	No	During maintenance of blacktop, mechanical failure of equipment engine caused the release of antifreeze outside Building 1002B. Equipment removed from service for repair.
97-56	9/29/97	Diesel Fuel	1 pint	No	During performance testing of an emergency generator, diesel fuel was noticed on the pavement beneath the fill port. Spillage was attributed to tank overfill and expansion of oil. All oil was contained on concrete and was remediated using speedy-dry.
97-57	10/6/97	Gasoline	< 2 pint	No	An employee's vehicle was observed leaking gasoline while parked in the Building 535B parking lot. Investigation revealed the car's gas tank was without a cap and the owner had apparently just recently filled the car with gas. The spilled material was contained to the asphalt and was removed using an oil absorbent.
97-58	10/2/97	Motor Oil	2 gal.	No	After servicing a vehicle, an Upton Industries employee proceeded to move the vehicle from the service bay. Apparently the mechanic failed to tighten the oil filter securely and oil sprayed from the vehicle onto the pavement. Speedy dry was used to absorb the spilled oil and the oil filter was secured.
97-59	10/14/97	Hydraulic Oil	<1 pint	No	Building 750
97-60	10/21/97	Transformer Oil	< 1 gal.	No	Non-PCB dielectric fluid seeped from the bushings of six transformers. Speedy-dry was placed beneath each of the leaking units. Polyethylene gasketed covers were affixed to the flanged rings that surround the bushings to contain the leaking oil until the transformers could be removed from the site.
97-61	11/14/97	Gasoline	< 1 quart	No	After arriving for work, the driver of a vehicle noted gasoline leaking from the fuel pump of his car. Speedy-dry was used to absorb the spill. The absorbent material was recovered for off-site disposal. The vehicle was repaired.
97-62	11/18/97	Ethylene Glycol	< 1 quart	No	While parked, an employees' vehicle developed an antifreeze leak. Speedy-dry was applied immediately to absorb the spill. Contaminated absorbent was collected for proper disposal.
97-63	11/21/97	Diesel Fuel	~ 1 gal.	No	During a planned electrical shutdown, an emergency generator developed a diesel leak. Speedy-dry was applied to the spill and all contaminated absorbent material was removed for off-site disposal.
97-64	11/25/97	Deionizing Effluent	~ 1 quart	No	A 55-gallon drum filled with ion exchange column wastewater developed a leak. Speedy dry was applied to absorb the wastewater that had leaked onto the floor. The drum was placed in an overpack container for disposal.
97-64	11/25/97	Deionizing Effluent	~ 1 quart	No	A 55-gallon drum filled with ion exchange column wastewater developed a leak. Speedy dry was applied to absorb the wastewater that had leaked onto the floor. The drum was placed in an overpack container for disposal.
97-65	12/05/97	Fuel Oil	Unknown	Yes	During removal of a former fuel oil tank, contaminated soils were encountered. These soils were excavated and containerized for off-site disposal. This tank had been out of service for approximately 15 years, consequently the time and quantity of the fuel spillage could not be estimated.
97-66	12/19/97	Ethylene Glycol	< 1 quart	No	A contractor vehicle developed an antifreeze leak. Speedy-dry was applied immediately to absorb the spill and a pail was placed beneath the vehicle to capture fluid as it leaked. The contaminated absorbent material was collected for proper disposal.
97-67	12/29/97	Hydraulic Oil	<2 gal.	Yes	A contracted drill rig developed a hydraulic leak during installation of monitoring wells along Weaver road. Upon noticing the spillage a plastic container was placed beneath the drill rig to intercept additional drippage. Oil was lost to the snow and ground immediately beneath the vehicle. All the contaminated snow and soil were collected and containerized.
97-68	12/30/97	Hydraulic Oil	~ 1 gal.	No	During brush removal, a hydraulic line of a skid-steer front-end loader ruptured after becoming entangled in the brush. All spilled oil was contained on asphalt and was immediately removed using spill absorbent.

*Reportable to offsite agencies.

2.4.2 Employee Trip-Reduction Plan

BNL submitted a final report on the Long Island Regional Improving Commute Grant awarded to BNL by the New York State Department of Transportation (NYSDOT) in 1996. It described the initiatives introduced and the work completed in 1995 and 1996 to meet the employee travel-reduction goals established in BNL's grant proposal. The NYSDOT then reimbursed the Laboratory for many of the costs associated with BNL's rideshare program which was introduced in May 1995.

The NYSDOT repealed the Employee Travel Reduction Program rules (17 NYCRR Part 68) in September 1996, making employer's participation in these programs voluntary. The Laboratory discontinued several rideshare incentives that had been offered to encourage employees to participate. Although the program is now voluntary, the ES&HS Division continues to assist employees in finding suitable rideshare partners by maintaining a ridematching database. The Laboratory also continues to subsidize the cost of a defensive-driver course for employees active in ridesharing partnerships, and guarantees ride service for program participants.

2.4.3 Reasonable Available Control Technology (RACT) Requirements

In March 1994, the Laboratory submitted a compliance plan which NYSDEC approved in June 1994 that described how the Laboratory intended to meet the reasonable available control technology (RACT) requirements of 6 NYCRR Subpart 227-2. Testing of boilers by BNL before submitting the plan confirmed that BNL complies with the NOx RACT emissions limit by burning residual fuel with a fuel-bound nitrogen content at, or below, 0.3 percent, and a similar fuel bound sulfur content. To ensure that fuel supplied to the CSF meets the requisite nitrogen limits, BNL agreed to collect composite samples of fuel deliveries each quarter, and submit them to an outside laboratory for analysis. Laboratory analysis is also used to confirm the sulfur content of the fuel. Samples were not taken in the fourth quarter of 1997 because no fuel was delivered.

During the peak ozone period, from May 1 to September 15, compliance with the 0.30 lbs/MMBTU NOx emissions limit for Boilers 6 and 7 was demonstrated by calculating the 24-hour daily arithmetic average rate of NOx emission from measured readings recorded by flue gas continuous emission monitoring systems (CEMS). From September 16 to April 30, the 30-day rolling average CEM emissions rate established compliance. In 1997, NOx emissions from Boilers 6 and 7 averaged 0.262 lbs/MMBTU and 0.243 lbs/MMBTU, respectively, as measured by the CEMS for each boiler On June 14, 1997, NOx emissions from Boiler 7 averaged 0.31 lbs/MMBTU, slightly above the daily limit. This exceedance and concurrent exceedance of the opacity limit were caused by a malfunction in a fuel-oil meter which, in turn, caused an erratic response of the boiler's combustion controls. The fuel oil meter was subsequently replaced and no further exceedances occurred. Throughout the year, the 30-day rolling average was not exceeded for either boiler.

2.4.4 Phaseout of Halon Fire-Suppression Systems

Based on recommendations in the 1994 Hughes Associates, Inc. study of existing Halon 1301 fire-suppression systems, two 90-pound halon fire suppression systems were removed from service during 1997. The systems were located at the IBM hutch in Building 725 and in Trailer 88, which is attached to a monitoring center for the linear-accelerator beam line. An earlier request to purchase a recovery unit that can be used to recover either Halon 1301 from stationary storage-vessels or Halon 1211 from unserviceable, portable fire extinguishers was approved for the 1998 fiscal year.

2.4.5 Ozone Depleting Refrigerants

Plant Engineering certified technicians service most of the refrigeration and air conditioning equipment on site. Covered equipment includes centrifugal, reciprocal and rotary screw chillers, split and package air conditioners. During equipment servicing and repair, refrigerants are recovered and recycled using EPA approved refrigerant recovery devices that are certified to meet re-

frigerant evacuation levels specified by 40 CFR 82.158. All refrigeration and air conditioning equipment is regularly inspected and maintained under the Management Maintenance Center Preventative Maintenance Program. If a leak is found, technicians will either repair the leak immediately, isolate the leak whenever possible, or will prepare a work order for needed repairs. Commercial refrigeration equipment found in the food service areas of Buildings 30 and 488 are serviced by an outside contractor. The contract between the BNL Administrative Support Division and the service company requires contractor technicians to comply with applicable requirements of 40 CFR 82 Subpart F in servicing refrigeration appliances.

During the calendar year, approximately 380 pounds of R-22 were recovered and reclaimed for future use from existing equipment during servicing or decommissioning. Also in 1997, the Plant Engineering Maintenance Management Center (MMC) upgraded the refrigerant management software program purchased in 1995. The upgrade allows the MMC to better track the maintenance history of all the refrigeration-and air-conditioning systems serviced. Also, the MMC can better monitor refrigerant leak-rates, establish repair schedules, and document the type of service performed and the amount of refrigerant added to a system, in accordance with record-keeping requirements of 40 CFR Section 82.166.

2.4.6 National Emission Standards for Hazardous Air Pollutants (NESHAPS)

2.4.6.1 Radioactive Airborne Effluent Emissions Governed by NESHAPs

In 1997, the BNL radiological NESHAPs program was audited under two major reviews: the DOE Integrated Safety Management Evaluation (ISME), and the EPA Multi-Media Compliance Evaluation Inspection. The ISME identified the Laboratory's need to fully implement a plan ensuring periodic confirmatory monitoring of minor sources of radioactive air effluents, i.e., those sources which have the potential to cause a public dose of less than 0.1 mrem per year. (Such sources are primarily bench-top operations in which liquid radioactive sources are used in a lab hood exhausting to a roof vent.) The EPA's Multi-Media Inspection found no deficiencies in the radiological NESHAPs program.

In 1997, the maximum off-site dose due to airborne radioactive emissions from the Laboratory continued to be far below the 10 mrem annual dose limit. The dose to the maximally exposed individual resulting from airborne emissions, calculated using EPA's CAP88-PC model, was 0.07 mrem (0.7 uSv). All data on airborne effluent releases and dose calculations were transmitted to both DOE and EPA on time, fulfilling the June 30 annual reporting requirement.

2.4.6.2 Asbestos

In 1995, the NYSDEC 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 (Building 490). To meet the pollution control requirements of 40 CFR Part 60 Subpart M, pre-filters and HEPA filters were installed in series in the exhaust systems of each of the three process hoods. Since fabrication of test panels commenced in 1995, Department of Applied Science personnel responsible for mixing and spraying have regularly inspected the pollution-control equipment and have monitored the equipment and exhaust systems daily for evidence of visible emissions, as required by Subpart M Section 61.144. No emissions of asbestos have been observed.

Since 1993, BNL has complied with 40 CFR 61 Subpart M regulations on airborne-fiber releases of asbestos. During 1997, the EPA Region II office was notified of three renovation or demolition jobs possibly involving the removal of regulated asbestos containing materials in conformance with Subpart M notification requirements. Formal annual notification of nonscheduled small renovations for 1997 was also made to both DOE and EPA in compliance with Subpart M reporting requirements. Based on data from 1996, it was estimated that 749 linear feet of pipe insulation, and 247 square feet of surface material would be removed in calendar year 1997.

2.4.6.3 Maximum Available Control Technology (MACT) Requirements

In September 1997, RHIC personnel opened discussions with the ES&H Services division about reactivating a conveyorized ultrasonic/vapor degreaser located in Building 924. The unit had been used for cleaning residual Mobil 1-lubricant from copper cables used in magnet assemblies. The discussions initially focussed on the provisions of the NESHAPS standard entitled National Emissions Standards for Halogenated Solvent Cleaning (i.e., 40 CFR 63 Subpart T) that would apply if 1,1,1-trichloroethane or another halogenated solvent covered by the rule was used for cleaning. The following requirements of Subpart T are applicable to in-line cleaning equipment: strict operational practices that must be followed during start-up, cleaning, and shutdown periods; provisions for monitoring and maintaining the vapor-zone temperature within the unit; and provisions for record-keeping and reporting. Other issues discussed included the limited availability and high cost of 1,1,1-trichloroethane and carbon tetrachloride caused by the EPA-imposed production phaseout of Class I ozone-depleting substances and permitting requirements for the cleaning equipment.

A new product called HyperSolve was considered; it is a non-halogenated cleaning solvent being reviewed by EPA as a possible alternative to 1,1,1-trichloroethane under their significant new alternatives program. According to its manufacturer, HyperSolve could be used in the ultrasonic/vapor degreaser with only minor adjustments to sump temperatures since the product's boiling point and vapor pressure are close to those of 1,1,1-trichloroethane. Had this product been used, the ultrasonic/vapor degreaser would have been under the less stringent requirements of 6 NYCRR Part 226, which are applicable to solvent-metal-cleaning operations. After evaluating the options, RHIC personnel approached the contractor who supplies the copper cable about making process changes to reduce or eliminate the need for cleaning. Ultimately, the contractor found a substitute lubricant that could be used in the cable-forming dyes. The new lubricant leaves a residue that is easily cleaned from the cable before it is delivered to BNL; hence, there was no need to reactivate the ultrasonic and the vapor degreaser.

2.4.7 Facility Audits

During EPA's multimedia audit of BNL environmental programs in May 1997, several CAA compliance issues were raised. In their subsequent report, the EPA noted various format deficiencies and past tardiness in the quarterly reports that BNL submits to demonstrate compliance with NO_x emission and particulate emission limits applicable to operations of the CSF boilers. Several changes to the reports were made to address the formatting deficiencies. In the past, BNL had to reduce the NOx CEM data to be consistent with the EPA reporting requirements. This very time consuming effort contributed to delays in submitting past reports. BNL addressed the delays by upgrading its data acquisition system.

During the audit, EPA reviewed several asbestos containing material (ACM) removal jobs for compliance with NESHAPS Subpart M requirements. The EPA report cited BNL with violations of these requirements on jobs that required removing asbestos insulated piping at the CSF and asbestos transite casing panels from a water tower outside Building 911. The report also cited BNL with violations of Subpart M work practice and notification requirements relative to the removal of ceiling tiles in Building 902.

BNL has since determined the causes for each of these alleged violations. BNL failed to notify EPA of the removal of asbestos insulated piping at the CSF because the job was improperly classified as renovation work that involved the removal of less than 260 linear feet of piping. In retrospect, the work should have been classified as a demolition job and BNL should have notified the EPA before the job commenced. BNL does not believe the transite casing panel work was subject to Subpart M notification requirements because the panels were considered Category II non-friable ACM prior to their removal and the contractor took precautions to ensure that the panels would not become friable as they were handled. Finally, a misinterpretation of 1988 inventory records of ceiling tiles in Building 902 led BNL personnel to conclude the tiles did not contain asbestos.

During the removal process, the work supervisor requested analysis for asbestos content of debris from pipe insulation in the concealed space above them. Samples of the pipe insulation, as well as the ceiling tiles themselves revealed that they did, in fact, contain asbestos. The work was immediately suspended. Before work resumed, proper worker safety and environmental precautions were taken for removing the asbestos materials. Notification was made to the EPA after the job was completed.

2.4.8 Title V Permit Application

The NYS Operating Permit Program approved by the EPA in November 1996, established a two-phase schedule for the submittal of Title V permit applications. Schedule dates for the submission of the Phase I and Phase II applications are December 9, 1997 and December 9, 1998 respectively. The Phase I application must include an overview of significant facility operations that produce airborne emissions, summaries of facility emissions and federal and state regulatory requirements applicable to facility operations, and a statement certifying the compliance status of facility operations with applicable requirements. The Phase II application requires a detailed description of all emission sources, pollution control devices, alternate operating scenarios, applicable federal and state emission standards, reporting and record keeping requirements and, compliance assurance monitoring procedures.

In planning for the Title V application, BNL staff recognized the need for a data management system that would enable BNL to assemble the permit application directly onto state application forms. Furthermore, the system had to be sophisticated enough to address the anticipated data management requirements after the Phase II permit application is submitted. In February 1997, a software package developed by ERM-Northeast capable of meeting these needs was purchased and installed.

In April 1997, BNL staff began walk through inspections of facility buildings to gather the requisite information on emission sources for the Phase II permit application. By years end, approximately sixty percent of the buildings had been inspected. In July 1997, BNL staff began transferring emission source information compiled during facility inspections into the Title V data management system. In December 1997, the Laboratory's Phase I application was submitted to the NYSDEC.

2.5 Suffolk County Sanitary Codes

A significant change was made to the Laboratory's tank inventory and management program in 1997. Due to increased public and regulatory awareness surrounding the HFBR investigation, a thorough review of all the Laboratory's storage facilities was conducted by the Laboratory and the Suffolk County Department of Health Services. This review identified an additional 400 "storage facilities" currently or formerly used by BNL including all vessels and containment systems used at the Reactor Division which were not included in the Laboratory's inventory due to the overlapping jurisdiction of the DOE and the SCDHS. These facilities also include the closed-loop cooling water systems at the accelerator facilities, tanks removed before the BNL and the SCDHS agreement, and other facilities thought to have been long abandoned. All 400 facilities now have been listed in SCDHS's inventory of storage facilities and "information" forms filed for approximately 350. Forms for the remaining facilities will be filed by mid-1998. For underground storage facilities not currently used, plans were prepared for their immediate removal, and, if necessary, for investigation into their potential for environmental damage (i.e., collection of soils and groundwater samples). The regulatory status of many of these facilities is under review.

Since the signing of a 1987 Agreement between Suffolk County and BNL, which requires the Laboratory to comply with the environmental requirements of SCSC Articles 6, 7, 10, and 12, the Laboratory has made significant progress toward bringing all storage facilities into compliance. Below is a description of the status of the activities conducted during 1997:

Month Status/Comments

February

The SCDHS gave Interim approval to operate the new centralized degreasing-facility for cleaning components used in ultrahigh vacuum environments. This facility replaced the former Acid Cleaning Facility which was closed in August 1997.

March

Conceptual design criteria for upgrading the HFBR spent fuel pool were submitted to the SCDHS for review. The design included installing a stainless-steel primary liner within the existing concrete structure, providing secondary containment. To ensure its impermeability, an epoxy sealant would be applied before installing the liner.

The SCDHS gave an interim permit to operate the Removal Action V (RAV) groundwater-treatment system installed and operated by the Environmental Restoration Division. This system uses two tanks to store groundwater-treatment reagents (i.e., sodium hypochlorite and polyphosphate).

August

Plans and specifications were submitted to the SCDHS to install two 20,000- gallon storage tanks at Building 811 to store water from the HFBR spent-fuel pool. Comments about these plans were received in September 1997; the deficiencies noted were adequately addressed during subsequent field inspections.

The former Acid Cleaning Facility was permanently closed. An SCDHS inspection verified that all tanks were emptied and permanently disconnected.

September

Tank tightness tests were conducted on seven underground storage petroleum tanks. All tanks were satisfactory. Copies of the test reports were filed with the SCDHS.

Plans and specifications for upgrades to Building 801 were submitted for review and approval. This project involves permanently removing numerous storage facilities from service and upgrading the remaining ones.

October

Tank registration forms were filed for 112 storage facilities identified during the SCDHS facility inspections.

SCDHS inspection of Bldg. 801 verified that fourteen storage facilities were removed.

SCDHS inspection of Building 933 verified the removal of heat exchangers, and five cable-oil tanks and associated oil formerly used by the Cryogenic Test Facility.

Temporary storage facilities were constructed at the Waste Management Facility to store waste water recovered from the BGRR air-duct system.

Plans and specifications were submitted and approved to upgrade one Co-60 source storage system at Bldg. 555.

November

SCDHS sent a rejection notice for upgrades to Building 801. Additional information on preexisting facilities was requested; this information was submitted expeditiously.

December

Plans and specifications were filed for upgrading thirty-one storage facilities. They are predominantly small, above-grade storage tanks used for oils, chemicals, and cooling water from the HFBR and BMRR; improvements to secondary containment systems were requested.

The new storage facilities (two 20,000 gallon ASTs) at Building 811 had final inspections by the SCDHS. Minor issues were noted which were immediately rectified.

Routine meetings with the SCDHS were held throughout the year to discuss progress in attaining compliance with SCSC Article 12. Specifically, there were discussions of tank inventory issues, pending upgrades to reactor facilities, and Article 12 compliance. Special meetings were held to review the SCDHS/BNL agreement language and discuss plans for complying with Articles 7 and 12.

2.6 Safe Drinking Water Act (SDWA)

2.6.1 Applicability to Brookhaven National Laboratory

The Laboratory maintains six wells, two water-storage tanks, and a distribution piping system for supplying potable water to the Laboratory community. Safe Drinking Water Act Requirements pertaining to the distribution and monitoring of public water supplies are promulgated under Part 5 of the New York State Sanitary Code, which is enforced by the SCDHS as the agent for the NYSDOH. These regulations are applicable to any water supply that has at least five service connections or regularly serves at least 25 individuals. The Laboratory supplies water to approximately 3,500 individuals and must comply with these regulations.

2.6.2 Potable Water Monitoring Requirements

SCDHS specifies the annual minimum monitoring requirements for potable-water suppliers. In response, the Laboratory prepares a Potable Water System Sampling and Analysis Plan which outlines sampling procedures and schedules the annual monitoring of BNL's potable-water system. The SCDHS found BNL's Sampling and Analysis Plan acceptable. Routine monitoring of the potable wells and the potable-water distribution system by BNL exceeded the prescribed minimum monitoring requirements. The monitoring requirements for 1997 included monthly bacteriological analyses, quarterly analyses for POCs, annual analysis for SOCs and pesticides, semiannual inorganic chemicals analyses, and annual analyses of micro-extractables and asbestos. The monitoring requirements for CY 1996 and 1997 were similar. Potable water samples were collected by BNL personnel and analyzed by NYSDOH certified contractor laboratories using standard methods. During 1997, BNL drew the potable-water supply from three wells (Potable Wells 10, 11 and 12). After completing major improvements to the WTP, Potable Wells 4, 6, and 7 also were used on a limited basis in 1997. All analytical data were submitted to the SCDHS as required by Chapter I, Part 5, of the NYS Sanitary Code. Table 2-5 summarizes the analytical data on bacteriological, inorganic, radiological, and asbestos measurements. Table 2-6 summarizes the analytical data on POCs, SOCs, pesticides, and micro-extractables. In response to the HFBR tritium plume investigation, concerns were raised about the quality of on-site potable-water. Although the Potable Water Sampling and Analysis Plan did not require analysis and reporting of radiological parameters, the results of quarterly radiological sampling were reported to the SCDHS; they showed that concentrations were below the NYS Drinking Water Standard. These data are summarized in Table 2-5. Table 2-6 shows that the water from wells 6 and 7 contained elevated levels of iron ranging from 0.94 to 2.9 mg/L. Water from wells 4, 6, and 7 is treated at the WTP to remove iron and associated contaminants before site distribution. The treatment includes aeration, lime softening, filtration, air stripping, and chlorination. The effluent from the WTP was tested and found to meet all DWSs.

All reported bacteriological, SOCs, pesticides, micro-extractables, and asbestos data collected during CY 1997 were within the NYS DWSs. Monitoring of lead and copper continued during CY 1997. Since the analytical results for 1996 showed all facilities to be within the Federal Action Levels for lead and copper, monitoring in 1997 was reduced to twenty locations, sampled annually. All analytical results again show BNL's potable-water system to be in compliance with the Action levels.

The SCDHS inspected BNL's potable-water supply system in June 1997, including walk-through examinations of the WTP, support facilities, and potable-well support-facilities. The inspector noted that all operations were satisfactory. In water samples collected during this visit, all analytical parameters met all federal and state MCLs and guidelines except for iron in Wells 4, 6 and 7 which exceeded the standard of 0.30 mg/L. Well 4 had an iron reading of 0.38, Well 6 had a reading of 3.2 and Well 7 had 0.95 mg/L. As previously described, water from these wells are treated to remove iron at the WTP.

2.6.3 Cross-Connection Control

The NYSDOH is authorized under Public Health Law 201 to supervise and regulate the sanitary aspects of potable-water supplies. Cross-connection control (CCC) is the means by which hazards associated with industrial or non-potable uses of the water supply are minimized. CCC consists of installing backflow prevention devices so that potentially contaminated water does not mix with the potable supply during low system-pressure. There are two categories of CCC devices. Primary devices consist of check-valves (CV), double check-valves (DCV), or reduced pressure zone (RPZ) devices that typically are installed between the facility's water connection and the potable water distribution system. These devices protect the main potable supply from contamination from facility operations, but they do not protect the facility's internal plumbing. Secondary devices, which may also consist of CV, DCV, RPZ, or vacuum breakers protect the internal plumbing systems. The degree of hazard posed by the occupancy determines which device is warranted.

The Laboratory has had an active CCC program since 1985, installing both primary and secondary CCC devices, and maintaining and testing of them annually as required by state regulations. Maintenance and testing is managed by the Plant Engineering Division, Maintenance Management Center, and all testing is done by NYS-certified backflow-prevention device testers. Annual test reports are transmitted to the SCDHS periodically throughout the year; during 1997, reports were submitted for 157 CCC devices.

2.6.4 Underground-Injection Control

Discharge of wastewater by underground injection is regulated under Part C of the SDWA, as codified under 40 CFR Part 144. Under the SDWA, an Underground Injection Control (UIC) program must be developed by each state for which the US EPA Administrator determines that underground injection could threaten a drinking-water source. The goal of the UIC program is to prevent the discharge of contaminants into the subsurface that could jeopardize the groundwater's quality. While all states have been deemed subject to these regulations, a NY State program was not been developed since, in the state's opinion, the existing SPDES program established under the CWA should meet the intent of the SDWA requirements. Due to NYS's reluctance to promulgate a new program, the Laboratory falls under the EPA UIC program wherein UIC devices are subject to permitting, sampling, analysis, and closure, if necessary. The EPA program defines five types of UIC wells: Class I and IV wells are used for injecting hazardous wastes, Class II wells are used for gas, oil, or hydrocarbon recovery, Class III wells are used for extracting minerals. Class V wells were generically defined as wells used for injecting a fluid not regulated under the previous classes, and which are deeper than their widest surface dimension. They include sanitary and other wastewater disposal systems including but not limited to, drywells, cesspools, septic tanks, and leach fields. BNL has only Class V wells.

Many Long Island communities that lack a central sanitary-and storm-water-sewer system discharge their sanitary-and process-waste-waters and stormwater runoff into cesspools, leaching pools, and drywells. The Laboratory maintains in excess of 200 UIC devices for discharging these wastewaters. In 1991, the Laboratory was cited by the EPA for operating numerous Class V UIC wells, which may have received industrial discharges and were, consequently, subject to UIC permitting. In response to this citation, an inventory of Class V UIC wells was provided to EPA , describing each of them and their status. To deal with those UIC wells which potentially were

Table 2-5
BNL Site Environmental Report for Calendar Year 1997
Potable Water Wells and Potable Distribution System,
Bacteriological, Inorganic Chemical and Radiological Analytical Data [1]

Compound	Well No. 4 (FD)	Well No. 6 (FF)	Well No. 7 (FG)	Well No. 10 (FO)	Well No. 11 (FP)	Well No. 12 (FQ)	Potable Distribution Sample	NYS Drinking Water Standard	
Total Coliform	ND	ND	ND	ND	ND	ND	ND	Negative	
Color	<5	*30	<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	ug/L
Conductivity	119	106	138	100	140	123	142	NS	umhos
Chlorides	19.3	15.8	23.3	10.8	18.6	16	22	250	mg/L
Sulfates	7.9	7.4	8.7	7.4	10	7.9	10.2	250	mg/L
Nitrates	0.3	0.3	0.4	0.4	0.6	0.3	0.3	10	mg/L
Ammonia	<0.02	0.04	< 0.02	<0.02	<0.02	<0.02	<0.02	NS	mg/L
pH	5.5	5.5	5.6	5.9	5.7	6	8.4	NS	SU
Methylene Blue									
Active Substances	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	NS	mg/L
Antimny	<5.9	<5.9	<5.9	<5.9	<5.9	<5.9	<5.9	6.0	ug/L
Arsenic	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	50	ug/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	ug/L
Chromium	<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	0.1	*2.9	*0.94	<0.02	<0.02	0.03	0.03	0.3	mg/L
Lead	2.8	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	15	ug/L
Manganese	0.17	0.23	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	ug/L
Nickel	<0.04	0.06	<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	ug/L
Sodium	11.5	9.8	15.8	8.2	12	12.4	22.4	NS	mg/L
Thallium	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	2.0	ug/L
Zinc	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	5.0	mg/L
Turbidity							<1.0		
Gross Alpha Activity	<1.62	<1.62	<1.62	4.78[3]	7.7[3]	4.5[3]	NA	15.0	pCi/L
Beta	<3.82	<3.82	<3.82	8.3	14.3[3]	8.7[3]	NA	50.0	pCi/L
Tritium	<304	<304	<304	<534	373	<534	NA	20000.0	pCi/L
Strontium-90	ND	ND	ND	0.14	0.16	0.08	NA	8.0	pCi/L
Gamma:									
K40	3.91	ND	ND	2.75	2.12	3.64	NA	280.0	pCi/L
MN-54	ND	ND	ND	0.2	ND	ND	NA	2000.0	pCi/L
Asbestos	NA	NA	NA	NA	NA	NA	NA	7	M.Fibers/L
Calcium	NA	NA	NA	NA	NA	NA	9.6 mg/L	NS	mg/L
Alkalinity	NA	NA	NA	NA	NA	NA	38 mg/L	NS	mg/L

1. This table contains the maximum concentration (minimum pH value) reported by the contractor laboratory.
2. Due to constructing improvements to the WTP, Well 4, 6 and 7 were not used for potable water distribution for the duration of 1997.
3. These maximum gross activity values were reported to the SCDHS in 1997. They were subsequently invalidated due to instrument error. (See Section 8.1.1.2 and chapter 10 for details)
(ND): Not Detected
(NS): DWS Not Specified
(NA): Analysis Not Required

Table 2-6
BNL Site Environmental Report for Calendar Year 1997
Potable Water Wells, Analytical Data for Principal Organic Compounds, Synthetic Organic Compounds Pesticides 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 Drinking Water Standard
	µg/L							
Dichlorodifluoromethane	ND	ND	ND	ND	ND	ND	ND	5
Chloromethane	ND	ND	ND	ND	ND	ND	ND	5
Vinyl Chloride	ND	ND	ND	ND	ND	ND	ND	2
Bromomethane	ND	ND	ND	ND	ND	ND	ND	5
Chloroethane	ND	ND	ND	ND	ND	ND	ND	5
Fluorotrichloromethane	ND	ND	ND	ND	ND	ND	ND	5
1,1-dichloroethene	ND	ND	ND	ND	ND	ND	ND	5
Dichloromethane	ND	ND	ND	ND	ND	ND	ND	5
trans-1,2-dichloroethene	ND	ND	ND	ND	ND	ND	ND	5
1,1-dichloroethane	ND	ND	ND	ND	ND	ND	ND	5
cis-1,2-dichloroethene	ND	ND	ND	ND	ND	ND	ND	5
2,2-dichloropropane	ND	ND	ND	ND	ND	ND	ND	5
Bromochloromethane	ND	ND	ND	ND	ND	ND	ND	5
1,1,1-trichloroethane	ND	1.1	2.8	ND	0.7	4.2	ND	5
Carbon Tetrachloride	ND	ND	ND	ND	ND	ND	ND	5
1,1-dichloropropene	ND	ND	ND	ND	ND	ND	ND	5
1,2-dichloroethane	ND	ND	ND	ND	ND	ND	ND	5
trichloroethane	ND	ND	ND	ND	ND	ND	ND	5
1,2-dichloropropane	ND	ND	ND	ND	ND	ND	ND	5
Dibromomethane	ND	ND	ND	ND	ND	ND	ND	5
trans-1,3-dichloropropene	ND	ND	ND	ND	ND	ND	ND	5
cis-1,3-dichloropropene	ND	ND	ND	ND	ND	ND	ND	5
1,1,2-trichloroethane	ND	ND	ND	ND	ND	ND	ND	5
Trihalomethanes	ND	8.7	ND	0.8	ND	ND	ND	100
1,1,2,2-tetrachloroethane	ND	ND	ND	ND	ND	ND	ND	5
1,3-dichloropropane	ND	ND	ND	ND	ND	ND	ND	5
Chlorobenzene	ND	ND	ND	ND	ND	ND	ND	5
1,1,1,2-tetrachloroethane	ND	ND	ND	ND	ND	ND	ND	5
Bromobenzene	ND	ND	ND	ND	ND	ND	ND	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
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

Table 2-6 (cont'd.)

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 Drinking Water Standard
	µg/L							
Alachlor	ND	ND	ND	ND	ND	ND	ND	2
Simazine	ND	ND	ND	ND	ND	ND	ND	50
Atrazine	ND	ND	ND	ND	ND	ND	ND	3
Metolachlor	ND	ND	ND	ND	ND	ND	ND	50
Metribuzin	ND	ND	ND	ND	ND	ND	ND	50
Butachlor	ND	ND	ND	ND	ND	ND	ND	50
Lindane	ND	ND	ND	ND	ND	ND	ND	0.2
Heptaclor	ND	ND	ND	ND	ND	ND	ND	0.4
Aldrin	ND	ND	ND	ND	ND	ND	ND	5
Heptachlor Epoxide	ND	ND	ND	ND	ND	ND	ND	0.2
Dieldrin	ND	ND	ND	ND	ND	ND	ND	5
Endrin	ND	ND	ND	ND	ND	ND	ND	0.2
Methoxychlor	ND	ND	ND	ND	ND	ND	ND	40
Toxaphene	ND	ND	ND	ND	ND	ND	ND	3
Chlordane	ND	ND	ND	ND	ND	ND	ND	2
Total PCB's	ND	ND	ND	ND	ND	ND	ND	0.5
Propachlor	ND	ND	ND	ND	ND	ND	ND	50
2,4,5,-TP (Silvex)	ND	ND	ND	ND	ND	ND	ND	10
Dinoseb	ND	ND	ND	ND	ND	ND	ND	50
Dalapon	ND	ND	ND	ND	ND	ND	ND	50
Pichloram	ND	ND	ND	ND	ND	ND	ND	50
Dicamba	ND	ND	ND	ND	ND	ND	ND	50
Pentachlorophenol	ND	ND	ND	ND	ND	ND	ND	1
Hexachlorcyclopentadiene	ND	ND	ND	ND	ND	ND	ND	5
Di(2-ethylhexyl)Phthalate [2]	ND	ND	ND	ND	ND	ND	ND	50
Di(2-ethylhexyl)Adipate	ND	ND	ND	ND	ND	ND	ND	50
Hexachlorobenzene	ND	ND	ND	ND	ND	ND	ND	5
Benzo(A)Pyrene	ND	ND	ND	ND	ND	ND	ND	50
Aldicarb Sulfone	ND	ND	ND	ND	ND	ND	ND	NS
Aldicarb Sulfoxide	ND	ND	ND	ND	ND	ND	ND	NS
Aldicarb	ND	ND	ND	ND	ND	ND	ND	NS
Oxamyl	ND	ND	ND	ND	ND	ND	ND	50
3-Hydroxycarbofuran	ND	ND	ND	ND	ND	ND	ND	50
Carbofuran	ND	ND	ND	ND	ND	ND	ND	40
Carbaryl	ND	ND	ND	ND	ND	ND	ND	50
Total Aldicarbs	ND	ND	ND	ND	ND	ND	ND	NS
Glyphosate	ND	ND	ND	ND	ND	ND	ND	50
Diquat	ND	ND	ND	ND	ND	ND	ND	50
Ethylene Dibromide	ND	ND	ND	ND	ND	ND	ND	0.05
Dibromochloropropane	ND	ND	ND	ND	ND	ND	ND	0.2

ND: Not detected at minimum detection limit.
NS: DWS Not Specified
Notes:

1. For compliance determination with NYSDOH standards, potable wells were analyzed quarterly during the year by H_2M Labs, Inc., a NYS certified contract Laboratory.
2. The minimum detection limits for POC analytes are 0.5 µg/L. Minimum detection limits for SOCs, Pesticides and Micro-extractables are compound specific and in all cases are less than the NYSDOH drinking water standard.
3. All concentrations contained in Table 2-6 are the maximum values reported by the contractor laboratory.
4. Trace quantities of Di(2-ethylhexyl)phthalate were detected in the composite samples prepared from Wells 4, 6 and 7, and Wells 10, 11 and 12. All detected concentrations were less than one-half the NYSDWS.

subject to Class V UIC permitting, a program was established to phaseout their use by redirecting these discharges into BNL's sanitary sewer. During 1996, major efforts were expended to eliminate discharges of potential industrial wastes to Class V wells and, where applicable, to close the wells. This project involved rerouting of floor and sanitary drains from Buildings 463, 481, 575, 815, 912, 912A, 913A, 913B, 913D, 913E, 914, 922, 925, 927, 928, 929, 960, 961, 962, and 964 to the sanitary sewer system; they formerly discharged to either the BNL stormwater system or UIC wells. Reports containing the analytical results for these systems and describing the follow-up actions and proposed methods for closure were forwarded to the SCDHS in June 1997. SCDHS concurred in August 1997.

The UIC program also was evaluated as part of the 1997 EPA multimedia audit of the Laboratory; the review resulted in a preliminary Notice of Violation and pending Order on Consent. While many of the "industrial" Class V UICs were included on a lab-wide inventory provided to EPA in 1992, many drywells used to dispose of "clean" water were not (i.e., stormwater). In accordance with 40 CFR Part 144, all Class V UIC are permitted by rule, provided an inventory of these wells is on-file with the EPA. All wells which were not on the EPA inventory lost the permit by rule status, and consequently, became subject to the proposed Consent Order. The details of the Consent Order and follow-up actions are under review, and are being negotiated with the EPA.

2.7 Toxic Substance Control Act (TSCA)

2.7.1 TSCA Program at BNL

The use and disposal of specific substances, such as polychlorinated biphenyls (PCBs), is regulated under the Toxic Substance Control Act (TSCA). The requirements include labeling, inspections, record keeping, immediate notification, and cleanup upon discovery of spills, and proper disposal. In 1992, the Laboratory issued a Safety, Environment, and Administrative Procedures Manual (SEAPPM) for managing PCBs. This SEAPPM formalized BNL's policy and identified specific responsibilities to control PCBs in accordance with TSCA requirements. The ES&HS Division maintains a database of PCB equipment in all Departments and Divisions to ensure proper tracking and record-keeping; it is updated from information supplied by the Departments and Divisions. In addition, the annual PCB Report for CY 1996, prepared in accordance with the requirements of TSCA, is retained on file at ES&HS Division. A copy was sent to the DOE-Brookhaven Group on June 30, 1997.

The TSCA program was evaluated during the EPA multimedia audit. Several issues were raised which ultimately resulted in the issuance of a Notice of Non-Compliance. These included the use of PCBs in an other than totally enclosed manner, failure to dispose of PCB wastes within one-year of date of generation and noncompliance with the thirty-day storage rule. All issues are being reviewed and discussed with the USEPA.

2.8 NYSDEC Bulk Chemical Storage Registration

Because improper storage and handling of hazardous substances are serious threats to New York's water supplies and to public safety, the New York State Legislature passed Article 40 of the Environmental Conservation Law (ECL), the Hazardous Substances Bulk Storage Act of 1986. This law required the NYSDEC to develop and enforce State regulations governing the sale, storage, and handling of hazardous substances to minimize leaks and spills. A closely related law, ECL Article 37, requires the NYSDEC to issue a list of substances defined as hazardous.

The NYSDEC implemented these bulk storage laws for hazardous substances through five sets of Chemical Bulk Storage (CBS) regulations.

- **6 NYCRR 595** Releases of Hazardous Substances — Reporting, Response, and Corrective Actions.
- **6 NYCRR 596** Registration of Hazardous Substance Bulk Storage Tanks.

- **6 NYCRR 597** List of Hazardous Substances.
- **6 NYCRR 598** Standards for Storing and Handling Hazardous Substances.
- **6 NYCRR 599** Standards for Constructing New Hazardous Substance Storage Facilities.

Owners of regulated storage tanks were responsible for registering these tanks with the NYSDEC by July 15, 1989. In accordance with Part 596, BNL submitted application forms to register Hazardous Substance Bulk Storage Tanks on July 13, 1989. The regulated tanks are used primarily to store water treatment chemicals. The NYSDEC issued a Registration Certificate in August 1989. In accordance with the NYS regulations, this certificate has been renewed every two years. The Laboratory submitted its most recent request for renewal to NYSDEC in June 1997. The application included revisions to reflect existing conditions; thus, four of the tanks previously included are no longer in service and one new tank was added. This tank is used to store sodium hydroxide at one of the potable wells and replaces a previous tank. The Certificate was issued by NYSDEC on July 3, 1997 and expires July 27, 1999.

2.9 Resource Conservation and Recovery Act (RCRA)

2.9.1 Facility Upgrades

Construction of the new Waste Management Facility (WMF) was completed in 1997. The facility consists of four separate buildings, including a hazardous waste storage facility (RCRA Building), a mixed-waste (hazardous and radioactive waste) storage facility (Mixed Waste Building), a radioactive waste processing and storage facility (Reclamation Building), and an administrative building (Operations Building). The Operational Readiness Review (ORR) was completed by DOE and BNL. All pre-start findings were addressed before operation began. WM began placing waste into the RCRA Building in October 1997, and intends to place waste into the Mixed Waste and Reclamation Building in the first quarter of CY1998. In addition, funding was secured for FY1998 to design and construct a Hot Cell for the Reclamation Building.

2.9.2 RCRA Part B Permit (6 NYCRR Part 373 Permit) and RCRA Closure

The two Part 373 Permits BNL received during 1995 remained active during 1997. The permit for the existing hazardous waste management facility (NYSDEC Permit #1-4722-00032/00021-0) became effective on 04/05/95 and expires on 08/31/98. In the fall of 1996, planning was initiated to implement the Closure Plan for the existing facility as HWM moves to the new WMF in 1997. The RCRA Closure process applies to the hazardous-and mixed-waste-storage facilities, specifically buildings 483 (drum storage facility), 448 (labpack storage facility), 360 (ignitable labpack storage), 361 (ignitable labpack storage), 444 (mixed waste storage), and 368 (ignitable mixed waste storage). Closure is proceeding on schedule and the old hazardous waste management facility will be closed by 8/31/98.

The Part 373 Permit for the new facility (NYSDEC Permit #1-4722-00032/00102-0) became effective 07/13/95 and expires on 07/12/05.

2.9.3 90-Day Accumulation Areas and Satellite Areas

Training programs for generators of hazardous waste have played an important role in emphasizing regulatory compliance, as well as the importance in preventing pollution and minimizing waste. In 1997, training was given on a site-specific basis (generators were trained at the department or division's building). The training includes modules on identifying hazardous waste, satellite accumulation, preventing pollution, and minimizing waste. This training was well-received, and will continue to be provided annually. Additionally, for the convenience of the Laboratory's staff, a computer-based training module was developed for the RCRA generator- training course. Training on 90-Day Hazardous Waste Accumulation Area was given at each accumulation area for each 90-Day Area manager and his or her designee; this training also will be provided annually.

2.9.4 Facility Audits

EPA Region II conducted a comprehensive inspection of BNL in May 1997, reviewing several management areas, including RCRA compliance. Minor compliance concerns were noted and BNL is working closely with regulating authorities to address them by strengthening existing waste-management systems. In addition, the NYSDEC conducted a detailed RCRA compliance inspection in June and July of 1997. Again, they noted minor concerns that were fully addressed by BNL.

Waste Management Division (WMD) staff periodically participate in the Departmental and Divisional self inspection programs (Tier I Inspections) giving them a chance to interact with the staff and provide guidance on specific issues. Internal audits and inspections of 90-Day Storage Areas revealed an increased awareness of requirements and an increased level of compliance. Minor problems still occur at Satellite Areas.

Departments and Divisions conducted self-assessments of their ESH programs during 1997; ES&HS Division assisted by developing an ESH Profile. HWM also provided a trend-analysis of waste generation, showing generation statistics for radioactive-mixed-hazardous-and industrial- waste. Additionally, a compliance summary was included in the ES&H Profile.

2.9.5 RCRA/TSCA Waste Moratorium

BNL continues to operate the program for certifying nonradioactive hazardous wastes under a 1996 DOE approval. The program incorporates the use of analytical procedures for materials that can be representatively sampled, and standard survey techniques for difficult-to-sample materials. Release criteria were based on the EPA Practical Quantitation Limits (PQLs) for the analytical program, and the limits specified in DOE Order 5400.5 Table IV-1 (plus an activation check) for the survey program. Approval of this process, combined with the already approved Process Knowledge Certification program, enables BNL to determine whether wastes are nonradioactive, and to handle them accordingly.

2.9.6 Pollution Prevention Program

BNL's Waste Minimization and Pollution Prevention (Wmin/P2) Plan establishes the Wmin/P2 program. The plan combines the requirements for a Wmin Plan and a Pollution-Prevention Awareness Plan required under DOE Order 5400.1, and lays out a strategy for implementing a formal program at BNL. The plan also contains information on Waste Minimization accomplishments.

The pollution-prevention program at BNL focuses on identifying and using cost-effective opportunities to reduce waste. Such opportunities are identified by formal Pollution Prevention Opportunity Assessments (PPOAs), Waste Minimization Working Groups, and employee's suggestions. Funding for implementation is sought through the ES&H Management Plan, the High Return on Investment Program, or through internal sources. In 1997, BNL's Wmin/P2 Program evaluated opportunities on waste batteries, fluorescent lights, oily rags and debris.

Specific examples of pollution prevention and waste minimization efforts for 1997 include the following:

- Construction of a new parts cleaning facility employing environmentally benign cleaning agents.
- Elimination of hazardous-waste generation at BNL's Vehicle Maintenance Shop.
- Use of nonhazardous substitutes for solutions containing mercury and lead.

2.9.7 Liquid Waste Management

Liquid chemical wastes generated during Laboratory operations are segregated by the waste generator and collected by the Waste Management Division (WMD) for temporary storage and off-

site disposal. These wastes are packaged in accordance with Department of Transportation (DOT), EPA, NYSDEC and DOE regulations for licensed off-site disposal.

The WMD collects small quantities of low-level liquid radioactive waste from waste accumulation areas throughout the site. Depending on the radionuclides in the water and their concentrations, wastes are either directly solidified at the HWMF or processed at the WCF. Buildings where large volumes (up to several hundred liters) of low-level liquid radioactive waste are generated have dual waste handling systems. These systems are identified as 'radioactive' and 'potentially radioactive'. All radioactive liquids are collected for proper disposition through the WCF. Potentially radioactive liquid waste streams are sampled and analyzed. If the radionuclide concentrations in the liquid meet the DOE, SPDES and BNL criteria, it may be released to the sanitary waste system. Otherwise, the liquid is transferred to the WCF for processing and storage/disposal.

2.9.8 Waste Disposal

For FY 1997, BNL shipped the following quantities and types of waste off-site to DOE approved, licensed, treatment/disposal facilities:

- Hazardous Waste: 44.66 metric tons
- Mixed Waste: 17.73 metric tons
- Radioactive Waste: 268.8 metric tons

In addition, BNL processed 44,700 gallons of liquid low-level radioactive waste on-site.

2.9.9 Federal Facilities Compliance Act (FFCA) Mixed Waste Site Treatment Plan

The FFCA, passed by Congress in 1992, requires DOE sites to work with DOE and local regulatory agencies to develop plans to treat and dispose of mixed wastes. The plan must identify treatment technologies and disposal facilities, and include a schedule for their disposal.

The FFCA is updated annually by BNL to describe initiatives taken during the year to address problems with new and existing mixed wastes. One current initiative, proposed by BNL to the NYSDEC, is a comprehensive plan to deal with existing wastes that involves a Broad Spectrum Procurement process, identification of treatment options, and development of milestone timelines for specific mixed-waste streams.

2.9.10 Mixed-Waste Inventory Report

In 1997, BNL updated its Site Treatment Plan to reflect current mixed-waste inventory. BNL also responded to requests for other data from DOE on specific types of mixed waste (i.e. PCB mixed waste) to help schedule their treatment. These updates provide DOE with information on the types and quantity of mixed wastes in storage, progress made in treating them, and identifies problems in arranging for treatment.

2.9.11 Comprehensive Environmental Response, Compensation and Liability Act (CERCLA)

On November 21, 1989, BNL was included on the National Priorities List of the EPA's hazardous waste sites considered a high priority for cleanup under the federal Superfund Program known as CERCLA.

In 1991, BNL established the Environmental Restoration Division (ERD) to oversee the Laboratory's Superfund activities. It is ERD's responsibility to remediate areas of known contamination, and to identify, characterize, mitigate, and eliminate, as appropriate, other areas of potential contamination.

In May 1992, an Interagency Agreement (IAG) came into effect among the DOE, the EPA, and the NYSDEC to insure compliance with CERCLA, the corrective action requirements of RCRA, the National Environmental Policy Act (NEPA), as well as corresponding New York State regulations. In particular, the IAG will insure that environmental impacts associated with past activities at BNL are thoroughly and adequately investigated so that appropriate response actions can be formulated, assessed, and implemented.

Before 1997, there were twenty-eight Areas of Concern (AOCs) at BNL, consisting of both active facilities, such as the STP, and the HWMF, and inactive facilities, such as former landfills, cesspools, and radioactive-waste storage tanks. After the discovery of the HFBR tritium plume, it was designated AOC twenty-nine in April 1997. The AOCs have been grouped and prioritized into Operable Units (OUs) and Removal Actions (RAs); the initial prioritization is documented in BNL's Response Strategy Document (RSD). The prioritization of response actions is a dynamic process, and is responsive to new characterization data, risk assessments, regulatory input, and public input. More detail on the Operable Units and Removal Actions are provided in Chapter 8.

The following are the highlights of accomplishments in 1997:

(1) Completion of free public water hookups to approximately 1,500 homes in NorthShirley and East Yaphank as a precautionary measure;

(2) Construction and operation of a groundwater cleanup system at the southern boundary that pumps and treats groundwater contaminated with common chemical solvents (OU III);

(3) Construction and operation of an air-sparging and soil-vapor-extraction cleanup system for soil and groundwater at a former Central Steam Facility oil spill (OU IV);

(4) Characterization of the HFBR tritium groundwater-contamination plume, then, construction and operation of a groundwater pump and recharge system along Princeton Avenue to hydraulically contain it, and elimination of the spent fuel pool as its continuing source by removing the spent-fuel rods and pumping out the pool's contents (OU III);

(5) Excavation, characterization, and backfilling of fifty-five unlined chemical/animal/glass holes from the Former Landfill area;

(6) Capping of the Interim Landfill;

(7) Public review and comment on the Remedial Investigation and Risk Assessment Report for OU I, which includes the radiological-contaminated soils at the former HWMF, and was subsequently finalized; and

(8) Submission of a pre-design report to DOE/EPA/DEC which evaluates alternatives to the removal action for cleaning up off-site groundwater contaminated with solvents (OU III).

The following summarizes the significant activities on the OUs and RAs by month for 1997:

January

Operable Unit I/VI: The draft Final Operable Unit I Feasibility Study and Proposed Plan was submitted to NYSDEC and USEPA.

Sampling of private wells for Ethylenedibromide (EDB) in the Weeks Avenue Area was completed by the SCDHS.

The draft Current Landfill 1996 Annual Environmental Report was submitted to the DOE, EPA, and NYSDEC.

Operable Unit III: BNL initiated a groundwater-characterization project for the tritium plume associated with the spent-fuel canal of the HFBR.

A Feasibility Study scoping meeting was held on 1/14/97 with the DOE, EPA, NYSDEC, and BNL.

Operable Unit IV: The final Remedial Design for the air-sparging/soil-vapor-extraction system was submitted to DOE, EPA, and NYSDEC.

Environmental Thermoluminescent Dosimeters (TLDs) were placed at the Sump Outfall Area of Building 650.

Groundwater monitoring was initiated for AOC 6.

Removal Action V: An In-Situ Air-Sparging pilot test was completed, and the draft report submitted to the EPA and NYSDEC.

February

Operable Unit I/VI: The draft Final Supplemental Characterization Report for the Chemical Holes was submitted by Argonne National Laboratory.

The Excavation Plan and Health and Safety Plan for the Chemical Holes were submitted to DOE, EPA, and NYSDEC.

Operable Unit III: The draft Remedial Investigation/Risk Assessment (RI/RA) Report was submitted to the EPA and NYSDEC. As part of the interim action for OU III, the SPDES equivalency package for the on-site south boundary groundwater treatment system was sent to the EPA and NYSDEC.

March

Operable Unit I/VI: The Certification (closeout) Report for capping the Former Landfill was submitted to the Administrative Record.

Operable Unit III: Five groundwater extraction wells were installed along the southern boundary. An action memorandum was updated to incorporate a sixth extraction well.

Operable Unit IV: The final Remedial Design was submitted to DOE, EPA, and NYSDEC.

Operable Unit V: A draft Work/Quality Assurance (QA) Plan for a metals study of Peconic River sediments was submitted to the EPA and NYSDEC.

April

Operable Unit I/VI: A public notice was issued on the remediation of the Chemical Holes. The final Evaluation of Alternatives Report was placed in BNL's Administrative Record.

Operable Unit III: Additional off-site ground monitoring wells were installed.

Amended applications for Air and SPDES Equivalency permits incorporating the sixth extraction well were sent to the NYSDEC.

Removal Action III: Waste from Building 919 and 919A was solidified in preparation for off-site shipping and disposal.

Brookhaven Graphite Research Reactor:
Groundwater characterization was completed upgradient and downgradient of the Building 801 Sump.

May

Operable Unit III: The sixth extraction well was installed, along with sixteen new monitoring wells. The air-stripper tower for the extraction system was installed.

Operable Unit IV: An evaluation of impacts from the Removal Action V Recharge Basin on the groundwater of Building 650's Sump Outfall Area was presented to DOE.

A design to reroute stormwater runoff away from the Building 650 Sump Outfall was submitted to DOE in response to NYSDEC comments on the draft Interim Monitoring Program for AOC 6.

Operable Unit V: The Draft Closeout Report for Imhoff Tanks was submitted to DOE, EPA, and NYSDEC.

Brookhaven Graphite Research Reactor:
Analytical data obtained just south of the 801 sump was transmitted to the DOE. A memorandum summarizing the status of the BGRR project was sent to DOE.

June

Operable Unit I/VI: The evacuation of the chemical/animal holes was initiated.

Operable Unit III: Thirty wells were installed as part of the investigation of the HFBR tritium plume.

Operation was started on the on-site south boundary groundwater-treatment system.

Removal Action V: Eight new permanent-monitoring wells and three piezometers were installed around the RA V recharge basin to monitor the HFBR tritium pump and recharge project.

July

Operable Unit III: Groundwater sampling for cobalt-60 in the Building 830 area was completed.

Operable Unit IV: Groundwater monitoring wells were installed. The air-sparge wells and air-sparge/soil vapor extraction wells were also completed in Remediation Area 2.

DOE-Environmental Measurement Laboratory completed an in-situ gamma spectroscopy survey of the Building 650 Sump Outfall area.

Removal Action III: The Building 481 Leaching Pit was closed out (backfilled).

Removal Action V: The Draft Supplemental Work Plan for on-site and off-site characterization was submitted to DOE.

Brookhaven Graphite Research Reactor:
A Baseline Change Proposal was processed under OU III to follow-up on additional groundwater characterization of the Pile Fan Sump.

August

Operable Unit IV: Air-sparge-and soil-vapor-extraction wells were completed in areas 1 and 2. Trenching and installing pipes for these wells also were completed.

Operable Unit V: Negotiations were finalized with BHG, EPA, and NYSDEC on the cleanupof the Peconic River.. This was presented to the Brookhaven Executive Round Table.

Removal Action V: Additional groundwater characterization of Sr-90 in the glass holes/former landfill area was completed.

September

Operable Unit I/VI: The Draft OU VI Final Feasibility Study was submitted to the EPA and NYSDEC.

Excavation and backfilling was completed of all Glass/Animal/Chemical Holes and Interim Landfill Pits. All excavated waste was sorted and processed.

Operable Unit III: A revised Remedial Investigation Report, incorporating the HFBR tritium plume, was submitted to the DOE, EPA, NYSDEC, and SCDHS.

Operable Unit V: Congressional staffs; Federal, state and county officials and citizen's advisory groups were briefed on the status of the Peconic River investigation.

The OU V Feasibility Study was submitted to the EPA and NYSDEC.

October

Operable Unit I/VI: A completed draft Close Out Report for the Chemical Holes was submitted to DOE, EPA, and NYSDEC. The Interim Landfill was capped.

Operable Unit III: The draft Operable Unit III Feasibility Study was submitted to BHG.

Operable Unit IV: The Air Equivalency Permit for the air-sparging/soil-vapor-extraction treatment system was approved by the NYSDEC.

Operable Unit V: The Riverhead Town Supervisor was briefed on the status of the Peconic River. Peconic River issues were presented to the SCDHS and the BNL oversight committee. Second and third organizational meetings were held on independent sampling of the Peconic River sediments. USEPA's Biological Technical Advisory Group toured the Peconic River.

November

Operable Unit III: The HFBR Tritium Compilation Report was submitted to DOE.

Operable Unit V: Independent sampling of the Peconic River sediments was completed.

December

Operable Unit I/VI: Nonhazardous/non-radiological soils from the chemical holes were disposed of off-site.

Operable Unit III: The draft Feasibility Study was submitted to EPA and NYSDEC.

2.10 Superfund Amendments and Reauthorization Act (SARA) of 1986

The SARA regulations require BNL to compile and submit Tier I (or the more detailed Tier II) reports to the State Emergency Response Commission (SERC), the Local Emergency Planning Committee (LEPC), and the responding fire organization. For BNL, the responding fire organization is the ES&HS Fire and Rescue Group. Under Federal SARA regulations, BNL is required to submit the Tier II report only if requested by the SERC, LEPC, or Fire Rescue Group. In 1991, the SERC requested that BNL submit the Tier II report for 1990 and each year thereafter. The report lists the average and maximum daily amounts of each chemical on-site which exceeds the threshold listed in the current EPA List of Lists. The Tier II report for CY 1997 was sent in February 1998 to the Fire Response Group, and to the DOE-BHG office for transmittal to the SERC and LEPC.

Submission of Form R, the Toxic Chemical Release Inventory (TRI) Reporting Form to EPA is required by Section 313 of the Emergency Planning and Community Right-to-Know Act (EPCRA). This report gives the public information on releases of listed toxic chemicals in their communities, and provides EPA with release information to assist them in determining the need for future regulations.

In 1997, BNL did not meet the reporting date for submitting Form R.

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

*Material Safety Data Sheet

2.11 National Environmental Policy Act

Eighty-five projects were reviewed for compliance with 10 CFR 1021 in CY 1996. None required environmental evaluations, as they were deemed to be categorically excluded actions. An Environmental Impact Statement was initiated for the High Flux Beam Reactor.

2.12 Federal Insecticide, Fungicide, and Rodenticide Act

Brookhaven National Laboratory has two programs in which insecticides, herbicides, and pesticides are used. As per regulatory requirements, both users, the Biology Department and the PE Division, maintain a log of applications made, and a log of the inventory at each facility. Key personnel are trained and certified by the NYSDEC in handling and applying these chemicals.

Annual training is required to maintain their certification. The applicator's log books are available for inspection and verification by the regulatory agencies. Annual reports showing the types and quantities of pesticides used are submitted to the NYSDEC by each certified applicator.

2.13 Endangered Species Act

There were no new findings on endangered species in 1997. However, plans are being made to develop a Tiger Salamander Management Plan in concert with a Wildlife Management Plan; these are expected to be completed in 1998.

2.14 National Historic Preservation Act

No activities affected cultural or historic resources during CY 1997.

2.15 Floodplain Management

During 1997, no new constructions were contemplated near, or within, the 100-year floodplain. Upgrades of the STP which were restarted in November 1996, were completed in 1997. In redesigning this system, dewatering activities planned as part of the original construction project were dropped after adding wetwell and ejector pumps. Consequently, impacts to the 100-year floodplain were averted.

2.16 New York Wild, Scenic, and Recreational River Systems Act

The portion of the Peconic River that flows through BNL is classified as "Scenic" under New York's WSRRSA. During 1997, there were no new activities that would be impacted by the requirements of the WSRRSA. As previously stated, construction of the STP upgrades recommenced in November 1996, as authorized under a 1994 NYSDEC WSRRSA permit. This project included constructing dual-modular aeration-treatment tanks, blower building and interconnecting piping, sludge-pumping station, wetwell and ejector pumps, and replacing the chlorine disinfection system with a system relying upon UV light to control bacteria. This project also included an addition to the main control building, installation of two new generators, and electrical upgrades. The project was completed in October 1997.

2.17 Protection of Wetlands

Other than the STP upgrades discussed in Section 2.15, no activities during CY 1997 impacted the wetlands or their buffer zones.

2.18 Environmental Compliance Audits

2.18.1 Integrated Safety Management Evaluation (ISME)

The Integrated Safety Management Evaluation (ISME) was an in-depth examination conducted by the Office of Oversight in DOE's Division of Environment Safety & Health (ES&H) in February

1997. It was designed to look at BNL's ES&H, and those of the DOE organizations that oversee the Laboratory. Seven criteria or guiding principles were used to determine the findings and to develop recommendations for BNL:

Line Management Responsibility;

Roles and Responsibilities;

Competence Commensurate with Responsibilities;

Balanced Priorities;

Identification of Requirements;

Hazard Control, and

Operations Authorization.

The principal findings concerned environmental radiation protection, and protecting the surface water and groundwater.

Brookhaven National Laboratory developed a detailed plan — BNL's Management Systems Improvement Project (MSIP) — that outlined specific actions to be taken, together with associated costs, schedule and management information. To implement this plan, AUI established an external ES&H management-improvement team, which included representatives from other national laboratories and industry. BNL also revitalized and reconstituted its ES&H management Advisory Group by co-opting senior managers and representatives from DOE, NYSDEC, SCDHS, and the EPA. A communications plan was developed to assure public involvement.

2.18.2 EPA Multimedia Audit

EPA Region II Office in May 1997 announced that they would begin a compliance audit of BNL. They looked at air emissions, water discharges, underground storage-tanks, hazardous-waste storage, handling and disposal of chemical wastes, spill prevention, toxic-substances management, radiation controls, emergency planning, underground injection-wells, toxic-release inventory, and community's right-to-know requirements.

After this audit, EPA issued the following violations: two for the underground injection control program; four of the CAA; four of TSCA PCB; and five of RCRA. However, the report also emphasized that none of them posed an immediate threat to workers, the environment, nor public health.

Because DOE and BNL had worked closely with EPA during the audit, many of the issues have been corrected, or plans are in place to resolve them. The EPA also reiterated what DOE found in its earlier ES&H review, that the Laboratory's management systems need to be strengthened.

BNL began the second phase of this multimedia review by minimizing the amount of waste produced and reducing emissions. The third phase, a review of environmental management issues at the Laboratory is expected to begin next year. These efforts, combined with the MSIP now being undertaken by the Laboratory's top administration and the DOE's 30-Day Action Plan, will improve environmental management at BNL.

2.18.3 Gilbert Hill Associates Audit of the Analytical Laboratory

At the request of the DOE headquarters, David L. Baldwin, Staff Scientist, PNNL, and Charles W. Miller, Principal Scientist, Gilbert Hill Associates, made an independent technical assessment of tritium data generated during the HFBR plume characterization. This assessment included a site visit to BNL on April 2-4, 1997, staff interviews, review of published data, review of the Laboratory's quality assurance and quality control data for about 70 batches of water samples analyzed for tritium activity, as well as numerous follow-up discussions, feedback, and comments from BNL staff. The assessment reached the following conclusions:

a. There was a lack of reliability in selected batches of samples due to incomplete or inadequate quality-control (QC) and poor precision on selected reruns;

b. Some routine analyses reported during the period failed to meet a selected criterion of 10% Relative Percent Difference.

They identified specific batches of samples by date for critical assessment and possible reanalysis.

A final report was submitted on May 7, 1997, presenting the results of the technical data quality assessment and recommendations for corrective actions. Detailed information on this audit is given in their final report: “Assessment of Tritium Analytical Data at Brookhaven national Laboratory/Analytical Services Laboratory, dated May 7, 1997”. A corrective plan was developed to address these findings.