

## List of Tables

Table 2-1.	BNL Pollution Prevention, Waste Reduction, and Recycling Programs, 2023. ....	2-12
Table 2-2.	Summary of BNL 2023 Environmental Restoration Activities. ....	2-20
Table 2-3.	Summary of BNL Sampling Program Sorted by Media, 2023.....	2-26
Table 3-1.	Federal, State, and Local Environmental Statutes and Regulations Applicable to BNL.....	3-4
Table 3-2.	BNL Environmental Permits.....	3-9
Table 3-3.	Analytical Results for Wastewater Discharges to Sewage Treatment Plant Outfall 001 .....	3-15
Table 3-4.	Analytical Results for Wastewater Discharges to Outfalls 002, 005 - 008, and 010.....	3-19
Table 3-5.	Potable Water Wells and Potable Distribution System: Analytical Results (Maximum Concentration, Minimum pH Value).....	3-22
Table 3-6.	Potable Water Wells: Analytical Results for Principal Organic Compounds, Synthetic Organic Chemicals, Pesticides, Micro-Extractables, and Perflourinated Compounds... ..	3-24
Table 3-7.	Potable Water Wells and Potable Distribution System: Perfluorinated Compounds.....	3-26
Table 3-8.	Applicability of EPCRA to BNL. ....	3-28
Table 3-9.	Summary of Chemical and Oil Spill Reports.....	3-29
Table 3-10.	Existing Agreements and Enforcement Actions Issued to BNL With Status... ..	3-37
Table 4-1.	Airborne Radionuclide Releases from Monitored Facilities.....	4-3
Table 4-2.	Gross Activity in Facility Air Particulate Filters.....	4-5
Table 4-3.	Gross Activity Detected in Ambient Air Monitoring Particulate Filters. ....	4-8
Table 4-4.	Ambient Airborne Tritium Measurements in 2023.....	4-9
Table 4-5.	Central Steam Facility Fuel Use and Emissions (2014–2023).....	4-12
Table 5-1.	Tritium and Gross Activity in Water at the BNL Sewage Treatment Plant for 2023.....	5-7
Table 5-2.	Radiological Analysis of Samples from BNL On-Site Recharge Basins (2023).....	5-11
Table 5-3.	Water Quality Data for BNL On-Site Recharge Basins (2023). ....	5-12
Table 5-4.	Metals Analysis of Water Samples from BNL On-Site Recharge Basins (2023). ....	5-13
Table 5-5.	Radiological Results for Surface Water Samples Collected Along the Peconic and Carmans River (2023).....	5-16
Table 5-6.	Water Quality Analytical Results for Data for Surface Water Samples Collected Along the Peconic and Carmans River (2023).....	5-17
Table 5-7.	Metals Analytical Results in Surface Water Samples Collected Along the Peconic and Carmans River (2023).....	5-18
Table 6-1.	Federal and New York State Threatened, Endangered, Exploitably Vulnerable, and Species of Special Concern at BNL.....	6-4
Table 6-2.	Radiological Analysis of Deer Tissue (2023). ....	6-12
Table 6-3.	Radiological Analysis of Grassy Vegetation and Associated Soils (2023) .....	6-16
Table 6-4.	Precipitation Monitoring (Mercury).....	6-18
Table 7-1.	BNL Groundwater Remediation Systems Treatment Summary for 1997 through 2023. ....	7-15
Table 8-1.	Five-Year Annual On-Site Direct Ambient Radiation Measurements (2019-2023). ....	8-7
Table 8-2.	Five-Year Annual Off-Site Direct Ambient Radiation Measurements (2019-2023) .....	8-9
Table 8-3.	Facility Area Monitoring Measurements of Direct Ambient Radiation (2019-2023).....	8-10
Table 8-4.	Five-Year Annual Neutron Monitoring Results (2019-2023).....	8-10

Table 8-5.	Maximally Exposed Off-site Individual Effective Dose Equivalent from Facilities or Routine Processes, 2023 .....	8-13
Table 8-6.	Five-Year Annual Maximally Exposed On-Site Dose Summary (2019-2023).....	8-15
Table 8-7.	Five-Year Site Dose Summary (2019-2023) .....	8-19
Table 9.1.	Summary of Detections in Trip and Field Blank Samples .....	9-8
Table 9.2.	Summary Results of 2023 DOE CAP Audits .....	9-12

## List of Figures

Figure 1-1.	Major Scientific Facilities at BNL.....	1-9
Figure 1-2.	Major Support and Service Facilities at BNL. ....	1-10
Figure 1-3.	BNL Groundwater Flow Map.....	1-12
Figure 1-4.	BNL Wind Rose (2022). ....	1-13
Figure 1-5.	BNL 2023 Monthly Mean Temperature versus 74-Year Monthly Average. ....	1-15
Figure 1-6.	BNL 2023 Annual Mean Temperature Trend (74 Years). ....	1-15
Figure 1-7.	BNL 2023 Monthly Precipitation versus 74-Year Monthly Average.....	1-16
Figure 1-8.	BNL 2023 Annual Precipitation Trend (74 Years). ....	1-16
Figure 2-1a.	Hazardous Waste Generation from Routine and Nonroutine Operations, 2019 – 2023 .....	2-9
Figure 2-1b.	Mixed Waste Generation from Routine and Nonroutine Operations, 2019 – 2023.....	2-9
Figure 2-1c.	Radioactive Waste Generation from Routine and Nonroutine Operations, 2019 – 2023 .....	2-9
Figure 2-2.	Waste Disposal in Tons, 2019 – 2023.....	2-11
Figure 2-3.	Waste Diversion in Tons, 2023 .....	2-11
Figure 2-4.	Annual Potable Water Use, 1999 – 2023... ..	2-14
Figure 2-5.	Carbon-Free Electricity Targets .....	2-18
Figure 2-6.	Net-Zero Emissions Goals.....	2-18
Figure 3-1.	Maximum Concentrations of Copper Discharged from the BNL Sewage Treatment Plant, 2018 – 2023 .....	3-16
Figure 3-2.	Maximum Concentrations of Iron Discharged from the BNL Sewage Treatment Plant, 2018 – 2023 .....	3-16
Figure 3-3.	Maximum Concentrations of Lead Discharged from the BNL Sewage Treatment Plant, 2018 – 2023 .....	3-17
Figure 3-4.	Maximum Concentrations of Mercury Discharged from the BNL Sewage Treatment Plant, 2018 – 2023 .....	3-17
Figure 3-5.	Maximum Concentrations of Nickel Discharged from the BNL Sewage Treatment Plant, 2018 – 2023 .....	3-18
Figure 3-6.	Maximum Concentrations of Silver Discharged from the BNL Sewage Treatment Plant, 2018 – 2023 .....	3-18
Figure 3-7.	Maximum Concentrations of Zinc Discharged from the BNL Sewage Treatment Plant, 2018 – 2023 .....	3-18
Figure 3-8.	Spills Trend, 2018-2023 .....	3-30
Figure 4-1.	Radiological and Non-radiological Air Emission Release Points Subject to Monitoring .....	4-4
Figure 4-2.	BNL On-Site Ambient Air Monitoring Stations.....	4-7



Figure 4-3.	Airborne Gross Beta Concentration Trend Recorded at Station P7 in 2023 .....	4-9
Figure 4-4.	BNL Scope 3 Greenhouse Gases: Impacts of COVID-19.....	4-12
Figure 5-1.	Sampling Stations for Surface Water and Fish .....	5-4
Figure 5-2.	An aerial photo of BNL's Sewage Treatment Plant (Recharge Basin Discharge) .....	5-5
Figure 5-3.	BNL Recharge Basin/Outfall Locations.....	5-9
Figure 5-4.	Schematic of Potable Water Use and Flow at BNL .....	5-10
Figure 6-1.	Deer Sample Locations, 2019 – 2023 .....	6-10
Figure 6-2.	Comparison of Cs-137 Values in Deer Flesh.....	6-14
Figure 6-3.	Ten-Year Trend in Cs-137 in Deer Flesh for Samples Taken at BNL .....	6-14
Figure 6-4.	Vegetation and Soil Sampling Locations 2023 .....	6-17
Figure 7-1.	Water Table Elevation Map for August 2023 Showing Groundwater Flow Directions and Locations of Supply and Remediation Wells.....	7-7
Figure 7-2.	VOC Plume Comparison Maps, 1997 and 2023 .....	7-9
Figure 7-3.	Radionuclide Plume Comparisons, 2002 and 2023 .....	7-10
Figure 7-4.	Current Firehouse and Building 170 PFOS Plume Comparisons, 2020-2021 and 2023 .....	7-11
Figure 7-5.	Former Firehouse PFOS Comparisons, 2020-2021 and 2023 .....	7-12
Figure 7-6.	Locations of BNL Groundwater Remediation Systems.....	7-14
Figure 8-1.	On-Site TLD Locations.....	8-5
Figure 8-2.	Off-Site TLD Locations.....	8-6
Figure 8-3.	Neutron TLD Area Monitors.....	8-11
Figure 9-1.	Flow of Environmental Monitoring QA/QC Program Elements. ....	9-4
Figure 9-2.	Summary of Scores in the Radiological Proficiency Evaluation Programs. ....	9-13
Figure 9-3.	Summary of Scores in the Non-radiological Proficiency Evaluation Programs. ....	9-13

