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ENDORSEMENT

In view of specific provisions of the Laboratory policy promulgated in the Environmental, Safety, Security and Health Policy mandating BNL's compliance with all government regulatory agencies and legal requirements with respect to environmental concerns, this Best Management Practices Plan, signed and dated, has my full and unmitigated support.

Signature on file
Steven Coleman
Associate Laboratory Director
Environment, Safety and Health Directorate

Signature on file
Tom Daniels
Associate Laboratory Director
Facilities & Operations Directorate

Signature on file
Jason Remien
Division Manager
Environmental Protection Division
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The disposal of wastewater generated by Laboratory operations is regulated under the Clean Water Act (CWA) as implemented by the New York State Department of Environmental Conservation (NYSDEC) and under Department of Energy (DOE) Order 458.1, Radiation Protection of the Public and the Environment. The goals of the CWA are to achieve a level of water quality that promotes the propagation of fish, shellfish, and wildlife; to provide waters suitable for recreational purposes; and to eliminate the discharge of pollutants into surface waters. New York State was delegated CWA authority in 1975. BNL operates under a State Pollutant Discharge Elimination System (SPDES) permit issued by NYSDEC to regulate Laboratory wastewater effluents.

1.1 PLAN PURPOSE

Brookhaven National Laboratory's Best Management Plan (BMP) describes the best management practices (BMPs) used by the Laboratory to prevent, or minimize the potential for, the release of toxic or hazardous pollutants to surface water and groundwater, including releases caused by facility site runoff, spills and leaks, sludge or waste disposal, and drainage from raw material storage.

The Laboratory's BMP has been prepared in accordance with the Special Conditions set forth in BNL's SPDES Permit No. 0005835, issued on January 28, 2021 by NYSDEC, which requires the permit holder to prepare, implement, and revise (as necessary) a BMP.

BNL's SPDES permit specifies monitoring requirements and effluent limits for 9 of 12 outfalls on site, as shown in Figure 1-1, and described below:

- Outfall 001 is used to discharge treated effluent from the Sewage Treatment Plant (STP) to groundwater via recharge beds.
- Outfalls 002, 002B, 003, 005, 006A, 006B, 008, 010, 011, and 012 are recharge basins used to discharge cooling tower blow-down, once-through cooling water, and/or stormwater. Only stormwater or once-through cooling water is discharged to Outfalls 003, 011, and 012; therefore, NYSDEC imposes no monitoring requirements for these discharges.
- Outfall 007 receives backwash water from the Potable Water Treatment Plant filter building.
- Outfall 009 consists of numerous subsurface and surface wastewater disposal systems (e.g., drywells) that receive predominantly sanitary waste, stormwater and steam- and air-compressor condensate discharges; NYSDEC does not require monitoring of these disposal systems.

Each month, the Laboratory prepares Discharge Monitoring Reports that describe monitoring results, evaluate compliance with permit limitations, and identify corrective measures taken to address permit excursions. These reports are submitted to NYSDEC and the Suffolk County Department of Health Services (SCDHS) and are reported annually in BNL's Site Environmental Report (SER). The SER is a detailed report that documents the Laboratory's environmental performance for the calendar year in review and summarizes environmental data; environment management performance; compliance with applicable DOE, federal, state, and local regulations; and performance in restoration and surveillance monitoring programs.
1.2 PLAN ORGANIZATION

BNL’s BMP is organized as follows, with supplementary information in Appendices A through C.

- Chapter 1: Purpose, Organization, and Implementation of the BMP
- Chapter 2: General Site Information
- Chapter 3: Laboratory Core Management Systems
- Chapter 4: Risk Identification and Assessment Areas
- Chapter 5: Laboratory-level BMPs

![Figure 1-1. BNL Recharge Basin/Outfall Locations.](image-url)
1.3 PLAN OVERSIGHT AND IMPLEMENTATION

The BMP is overseen and implemented through the coordinated efforts of the Laboratory's Environmental Protection Division (EPD) and Facilities and Operations (F&O) Directorate, with overall oversight by the EPD Manager. EPD and F&O personnel are trained to implement best management practices within their related area of expertise. Laboratory management has the overall responsibility for the successful implementation of the plan. Training requirements for personnel involved in the oversight and implementation process of the BMP are discussed in Chapter 5.

1.4 PLAN REVIEW AND AMENDMENT

The BMP Plan is reviewed annually and modified whenever:

- Changes at BNL materially increase the potential for significant releases of toxic or hazardous pollutants.
- Actual releases indicate the plan is inadequate.
- Correspondence is received from any regulatory agency highlighting inadequacies in the plan.

The plan will be revised within six months of each change or incident and will include any new or more effective management system or structural measure, as appropriate. The plan will also be reviewed and amended whenever there is a significant change in the facility, operations, material storage, or maintenance procedures that would materially affect the potential for spills of toxic or other hazardous substances.

1.5 PLAN AVAILABILITY AND DISTRIBUTION

A hard file copy of the BMP Plan will be maintained by the EPD Manager and will be available for inspection by designated representatives of the U.S. Environmental Protection Agency (EPA), NYSDEC, and other authorized government agencies. An electronic copy will be available on EPD’s website at http://intranet.bnl.gov/esh/env/.

REFERENCES AND BIBLIOGRAPHY

Established in 1947, BNL is a multi-program national laboratory managed for DOE by Brookhaven Science Associates (BSA), a partnership formed by Stony Brook University and Battelle Memorial Institute. BSA has been managing and operating the Laboratory under a performance-based contract with DOE since 1998. From 1947 to 1998, BNL was operated by Associated Universities, Incorporated. Prior to 1947, the site operated as Camp Upton, a U.S. Army training camp, which was active from 1917 to 1920 during World War I and from 1940 to 1946 during World War II.

2.1 BNL OWNER AND OPERATOR

Facility Owner:
U.S. Department of Energy
Brookhaven Site Office
53 Bell Avenue, Building 464
Upton, New York 11973
Attention: Mr. Robert Gordon, Brookhaven Site Manager

Facility Operator:
Brookhaven Science Associates
Directors Office
Brookhaven National Laboratory
40 Brookhaven Avenue, Building 460
Upton, New York 11973
Attention: Mr. Jack Anderson, Chief Operating Officer

2.2 MISSION AND RESEARCH

BNL's broad mission is to contribute to the DOE missions in energy resources, environmental quality, and national security, and to produce excellent science and advanced technology in a safe and environmentally sound manner with the cooperation, support, and involvement of its scientific and local communities. BNL conducts research in physics, chemistry, biology, medicine, applied science, and a wide range of advanced technologies.

2.3 LOCATION AND POPULATION

BNL is located near the geographical center of Suffolk County, Long Island, New York. The Laboratory’s 5,265-acre site is located in Brookhaven Township, approximately 60 miles east of New York City. BNL is one of the five largest high-technology employers on Long Island, with approximately 2,529 employees (end of FY 2019) that include scientists, engineers, technicians, and administrative personnel. In addition, the Laboratory annually hosted 6,824 (FY2019) guests and users.

2.4 GEOLOGY AND HYDROLOGY

The Laboratory is situated on the western rim of the shallow Peconic River watershed. The marshy areas in the northern and eastern sections of the site are part of the headwaters of the Peconic River. Depending
on the height of the water table relative to the base of the riverbed, the Peconic River both recharges to and receives water from the underlying Upper Glacial aquifer. In times of sustained drought, the river water recharges to the groundwater; with normal to above-normal precipitation, the river receives water from the aquifer. Due to drought conditions and recent modifications to the Sewage Treatment Plant (STP), including the installation of a dual-disc final filtration system and discharging the effluent to groundwater via recharge beds, the Peconic River is mainly sub-surface for most of the year. Only during seasonally influenced high groundwater periods or heavy rains is the flow above ground. The Long Island Regional Planning Board and Suffolk County have identified the Laboratory site as overlying a deep-flow recharge zone for Long Island groundwater (Koppelman 1978). Precipitation and surface water that recharge within this zone have the potential to replenish the Magothy and Lloyd aquifer systems lying below the Upper Glacial aquifer. It has been estimated that up to two-fifths of the recharge from rainfall moves into the deeper aquifers. The extent to which groundwater on-site contributes to deep-flow recharge has been confirmed using an extensive network of shallow and deep wells installed at BNL and surrounding areas (Geraghty & Miller 1996). This groundwater system is the primary source of drinking water for both on- and off-site private and public supply wells and has been designated a sole source aquifer system by the EPA.

2.5 FACILITIES AND OPERATIONS

Most of the Laboratory's principal facilities are located near the center of the site. The developed area is approximately 1,820 acres:

- 500 acres originally developed by the Army (as part of Camp Upton) and still used for offices and other operational buildings
- 200 acres occupied by large, specialized research facilities
- 520 acres used for outlying facilities, such as the Sewage Treatment Plant, ecology field, housing facilities, and fire breaks
- 400 acres of roads, parking lots, and connecting areas
- 200 acres occupied by the Long Island Solar Farm

The balance of the site, approximately 3,400 acres, is mostly wooded and represents the native pine barrens ecosystem.

The location of the major scientific facilities at BNL are shown on Figure 2-1. Additional facilities, shown on Figure 2-2 and briefly described below, provide basic utility and environmental services. Further information on these facilities can be found on the BNL web site at http://intranet.bnl.gov/.

- **Central Chilled Water Plant (CCWP).** This plant/Bldg. 600 provides chilled water sitewide for air conditioning and process refrigeration via underground piping. The plant has a large refrigeration capacity and reduces the need for local refrigeration plants and air conditioning.

- **Central Steam Facility (CSF).** This facility/Bldg. 610 provides high-pressure steam for facility and process heating sitewide. Either natural gas or fuel oil can be used to produce the steam, which is conveyed to other facilities through underground piping. The majority of condensate is collected and returned to the CSF for reuse, to conserve water and energy. **Fire Station.** The Fire Station/Bldg. 599 houses six large response vehicles. The BNL Fire Rescue Group provides on-site fire suppression, emergency medical services transportation to local hospitals, hazardous material response, salvage, and property protection.
- **Major Petroleum Facility (MPF).** This facility/STO611 provides reserve fuel for the CSF during times of peak operation. With a total capacity for in-service tanks of 1.9 million gallons, the MPF primarily stores No. 2 and No. 6 fuel oil. The 1997 conversion of CSF boilers to burn natural gas, as well as oil, has significantly reduced the Laboratory’s reliance on oil as a sole fuel source when other fuels are more economical.

- **Sewage Treatment Plant (STP).** This 2.3 MGD Plant/Bldg. 575 treats sanitary and certain process wastewater from BNL facilities like the operations of a municipal sewage treatment plant. The facility has secondary treatment via a modular aeration system and a dual disc-final filtration treatment system train that discharges to groundwater via four recharge beds, each occupying 2.2 acres per bed. The discharge is permitted under SPDES Discharge Permit (NY0005835), with an effective date of January 28, 2021 and an expiration date of December 31, 2030. Additionally, the system has two lined Emergency Holding Ponds with individual capacities of 3 million gallons each that can be utilized for emergency diversions.

- **Waste Management Facility (WMF).** This facility (Bldgs. 855, 860 and 865) is a state-of-the-art complex that has a NYSDEC-issued 6 NYCCR Part 373 Permit for the storage of RCRA hazardous and mixed wastes generated from BNL’s research and operations activities. The facility was built with advanced environmental protection systems and features, including built-in secondary containment with sub-surface access ports for monitoring and began operations in December 1997.

- **Water Treatment Plant (WTP).** The potable water treatment plant/Bldg. 624 has a capacity of 5 million gallons per day. Potable water is obtained from five on-site wells. Water pumped from three supply wells located along the western boundary of the site is treated at the WTP with a lime-softening process to remove naturally occurring iron and sodium hypochlorite is utilized for disinfection. The plant is also equipped with dual air-stripping towers to ensure that volatile organic compounds (VOCs) are at or below New York State drinking water standards. Two wells located along the eastern section of the developed site are treated by the addition of sodium hydroxide to increase the pH of the water to make it less corrosive, and by the addition of sodium hypochlorite to control bacteria.

### 2.6 NATURE OF MATERIALS HANDLED

BNL utilizes a wide range of materials, including wastes common to many businesses and industries, such as office wastes (e.g., paper, plastic, glass, etc.), aerosol cans, batteries, paints, and oils. However, the Laboratory’s unique scientific activities also generate waste streams that are subject to additional regulation and special handling, including radioactive, hazardous, and mixed wastes. BNL’s WMF, operated by EPD, is responsible for collecting, storing, transporting, and overall management for the proper disposal of these specialized wastes.

BNL also stores large amounts of fuel oil for steam heating, fleet vehicles, and various power equipment, and is designated as a Major Oil Storage Facility (MOSF) under NYSDEC definitions due to the large volume of fuel oil stored on site. The fleet of Guest Service vehicles use a gasoline station at Bldg. 423 with dispensers for refueling (gasoline and E-85) and a bio-diesel tank with a dispenser at Bldg. 639.

### 2.7 BULK TRANSFER AREAS

#### 2.7.1 ABOVEGROUND TANK STORAGE

There are many aboveground tank storage areas located on site. The MPF contains six large aboveground tanks and has a total storage capacity for in-service tanks of 1.9 million gallons. The tanks are in areas that have bentonite-sealed, Geosynthetic Clay Lined earthen berms that provide secondary containment.
A roofed unloading facility (Bldg. 639) for the large tanks, including an unloading pad with an epoxy-coated concrete floor and a collection trough/sump, is present that acts as secondary containment for fuel deliveries. The Production Division (SSSG-2) has three aboveground storage tanks which hold 20,000 gallons of fuel oil (see Figure 2-3 for SSSG-2 location). The tanks and off-loading area are all provided with secondary containment in the form of epoxy-coated concrete and collection sumps.
Figure 2-2. Major Support and Service Facilities at BNL.

The bermed areas for the aboveground storage tanks at both the MPF and SSSG-2 are connected to the site sanitary system. The MPF tanks are connected to the sanitary sewer via locked post indicator valves (PIV’s) and the SSSG-2 secondary containment for the Production Service’s tank berm is manually drained to the sanitary sewer via a hose and submersible pump. Any accumulated rainwater is discharged to the sanitary sewer after following the BNL Facilities and Operations Standards Operating Procedure (SOP) DF-ESH-009, Draining Secondary Containments. This SOP requires that site personnel inspect the bermed area for any visible sheen prior to draining of the berm to the sanitary sewer. If a sheen is observed, steps are taken to prevent the release of oil to the sanitary system prior to authorizing releases.
In addition to these large fuel tanks, there are smaller (50-4,000 gallon) aboveground tanks which service satellite boilers, emergency generators, and other processes such as motor oil and/or process chemicals. These tanks are provided with double-walled configurations and are either equipped with interstitial leak detection alarms or have ports for visual inspections of the interstices. All these tanks are inspected on a monthly basis, minimally.

2.7.2 DRUM/CONTAINER STORAGE AREAS

Drums containing raw materials, industrial waste, or hazardous waste are typically maintained inside buildings and do not come into contact with stormwater while in storage. For example, the Fabrication Services Facility protects industrial liquids stored in drums from contacting stormwater via the use of a secondarily contained drum storage structure that utilizes concrete support walls, an epoxy-coated floor, a metal roof, and a steel grating installed over the epoxy-coated floor. This storage facility is open on four sides, and occasionally during heavy precipitation events, driving rain can fall within the containment area under the roofline and accumulate inside the secondary containment floor area. When this happens, the floor area is inspected and any accumulated liquid is checked for oil sheens; if none are present, the liquid is pumped to sanitary via F&O Procedure DF-ESH-009, Draining Secondary Containments.

There are several exterior accumulation areas in the form of enclosed and contained HAZSTOR Sheds used for RCRA Hazardous Waste accumulation areas that are kept for periods of less than 90 days. Hazardous waste is kept in the above structures that have secondary containment and locking doors with metal floor gratings that protect the drums from the elements.

2.8 ELECTRICAL TRANSFORMERS

Electrical equipment such as transformers and capacitors comprise approximately 6 percent of the aboveground oil storage capacity on site. The majority of this equipment is small, containing less than 100 gallons. From calendar years 2017 through 2021, less than 20 gallons of transformer oil was spilled from transformers. Legacy spills from PCB transformers at the apartments were discovered recently and contaminated soil was excavated and sent off-site for proper disposal. Additional cleanups planned will include a legacy spill discovered near Apartment/Bldg. 397 and this too will be remediated.

Electrical substations provide the greatest potential for large volume transformer spills (e.g., the largest transformer at BNL is located adjacent to the CSF and contains 7,470 gallons). It is BNL's general practice to provide secondary containment to all transformers with individual capacities of 660 gallons or greater, or combined capacities of 1,320 gallons.

Outdoor electrical transformer pads have bermed areas that collect and contain rainwater. These bermed areas are connected to either the sanitary sewer or to stormwater conveyances. F&O’s Procedure DF-ESH-009, Draining Secondary Containments, is followed for draining rainwater from the bermed transformer pad areas. There are other transformer pads that have concrete curbed berms that contain crushed bluestone; the rainwater is discharged directly to the ground surface beneath the crushed bluestone.

2.9 DRAINAGE AND SEWER SYSTEMS

2.9.1 STORMWATER DRAINAGE

The developed areas of the BNL site require stormwater management. The stormwater is collected in catch basins and/or diverted to culverts to low-lying areas, and/or drywells, and/or recharge basins. A small portion of rainfall is collected in bermed areas around aboveground storage tanks and outdoor electrical transformer pads and is directed to the sanitary sewer system as outlined in the above sections.
The site is served by eight major recharge sections, with the following designations: FHWMF, HN, HO, HS, HT, HW, MPF, and SSSG. Each section is served by a recharge basin or low-lying drainage area, as shown on Figure 2-3. Four of these sections (HN, HO, HS, and HT) have effluent flow gauging and monitoring stations. The stations are equipped with flow monitoring instrumentation consisting of either an H or Parshall flume. The flowmeters are connected to a circular flow chart which continually monitors the discharge flow to the recharge area. The flow recording equipment is housed in a concrete block building which also contains an automatic refrigerated composite sampler. The samplers may be used to collect composite samples for subsequent compliance monitoring.

2.9.2 SANITARY SEWAGE

The majority of the sanitary waste generated on site is sent to the STP for treatment. The STP provides tertiary treatment of the wastewater and includes the following processes: settling/sedimentation, biological reduction of organic matter and nitrogen, and final filtration prior to discharging to one of the four recharge basins.

Detection and alarm systems are maintained at the STP for the prevention of releases of wastewater which may exceed allowable levels. Continuous monitoring for radioactivity, pH, and conductivity is conducted at two locations prior to the modular aeration tanks. Any wastewater that does not meet the BNL effluent criteria or the SPDES effluent limits is diverted to one of two emergency holding ponds with capacities of three million gallons each. Wastewater diverted to these ponds is treated before being released. The influent to the STP is also monitored for oil on a daily basis by NYSDEC-licensed Sewer Treatment Plant operators who are present at the STP prior to discharge to the retention basins.

2.9.3 NON-CONTACT COOLING WATER

Water obtained from the BNL Potable Water System is used for non-contact cooling water in several Laboratory facilities. The non-contact cooling water is sent to the various recharge areas for recharge to groundwater.

2.9.4 PROCESS WASTEWATER

There are several minor process wastewater streams generated at BNL which are discharged to the sanitary sewer, including boiler and cooling tower blowdown. Process water discharges are evaluated by EPD personnel for discharge to the Sanitary System or to the Stormwater System in order to ensure compliance with the current SPDES Permit.

REFERENCES AND BIBLIOGRAPHY


Figure 2-3. Watersheds for BNL Recharge Basins.
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BNL's mature Integrated Safety Management and Environmental Management Systems serve as a cornerstone for preparing the Laboratory's Best Management Plan as required under BNL's State Pollutant Discharge Elimination System permit. These management systems ensure that BNL conducts all activities in a safe and environmentally friendly manner by incorporating best management practices into all work planning and activities on site.

3.1 INTEGRATED SAFETY MANAGEMENT SYSTEM

BNL's integrated Safety Management System (ISMS) is a systematic approach to integrate safety into management and work practices by addressing all types of work and hazards and using best management practices to ensure safety for workers, the public, and the environment. ISM considers potential work hazards, studies and analyses, and site hazards. To achieve this objective, DOE has established Guiding Principles and safety management core functions. These seven Guiding Principles establish the overarching basis for the development of integration of safety processes:

- Line management responsibility for safety.
- Clear roles and responsibilities.
- Competency commensurate with responsibilities.
- Balanced priorities.
- Identification of safety standards and requirements.
- Hazard controls tailored to work being performed.
- Operations authorization.

DOE's five core functions establish the formal structure for planning and executing work at BNL:

- Define the scope of work.
- Analyze the hazards.
- Develop and implement hazard controls.
- Prepare and perform work within controls.
- Provide feedback and continuously improve performance.

When planning any type of work at the Laboratory (i.e., field work, Experimental Safety Reviews, Work Permits, etc.), the safe and successful conduct of work relies on the adherence to ISM’s principles. ISMS training is mandatory for all employees.

3.2 ENVIRONMENTAL MANAGEMENT SYSTEM

BNL has an established Environmental Management System (EMS) in place to ensure that environmental issues are systematically identified, controlled, and monitored. It also provides mechanisms for responding to changing environmental conditions and requirements, reporting on environmental performance, and reinforcing continual improvement. Benefits from EMS implementation include:

- Improved overall environmental performance.
- Identification of pollution prevention opportunities.
- Improved environmental compliance.
- Enhanced operational control and efficiency.
- Cost savings.
- Reduced risk (environmental, health, and safety).
- Improved internal communication.
- Improved external relations and public image.

The Laboratory’s EMS was designed to meet the rigorous requirements of the globally recognized International Organization for Standardization (ISO) 14001 Environmental Management Standard, with additional emphasis on compliance, pollution prevention, and community involvement. Annual assessments are required to maintain an EMS registration, and recertification assessments performed by third-party independent auditors of the entire EMS occur every three years. BNL has remained in substantial conformance with the ISO 14001 Standard since officially being registered in 2001. BNL's EMS allows the Laboratory to establish operational controls through its worker planning and controls process.

3.3 POLICY STATEMENT

BNL’s environmental commitments are incorporated into a comprehensive Environmental, Safety, Security, and Health (ESSH) Policy (See Figure 3-1). The policy, issued and signed by the Laboratory Director, makes clear the Laboratory’s commitment to environmental stewardship, the safety of the public and BNL employees, and the security of the site. The policy is also a statement of the Laboratory’s intentions and principles regarding overall environmental performance. It provides a framework for planning and action and is included in employee, guest, and contractor training programs. The ESSH Policy is posted throughout the Laboratory and on the BNL website at http://www.bnl.gov. Managers, supervisors, and EMS Management Representatives must ensure that the ESSH Policy is communicated within their organizations.

3.3.1 PLANNING

The planning requirements of the ISO 14001 Standard require BNL to identify the environmental aspects and impacts of its activities, products, and services; to evaluate applicable legal and other requirements; to establish objectives and targets; and to create action plans to achieve the objectives and targets.

3.3.2 ENVIRONMENTAL ASPECTS

An “environmental aspect” is any element of an organization’s activities, products, and services that can impact the environment. As required by the ISO 14001 Standard, BNL evaluates its operations, identifies the aspects that can impact the environment, and determines which of those impacts are significant. The Laboratory’s criteria for significance are based on actual and perceived impacts of its operations and on regulatory requirements.

EMS Management Representatives define and document significant environmental aspects and ensure they are considered when developing annual objectives and targets. Environment Compliance Representatives (ECRs) assist the EMS Representatives to ensure a successful program by performing assessments to ensure that aspects are current with legal requirements. Line managers and supervisors are made aware of the significant environmental aspects associated with their operations and communicate them to their staff.

BNL utilizes several processes to identify and review environmental aspects. Key among these is the identification of significant environmental aspects and impacts as outlined in the Environmental Aspects and Impacts Subject Area in the Laboratory's Standards Based Management System (SBMS). SBMS is a web-based system that provides BNL staff, guests, users, and visitors with institutional policies,
Environmental, Safety, Security, and Health Policy

This document is a statement of Brookhaven National Laboratory’s (BNL) Environmental, Safety, Security, and Health (ESSH) policy. BNL is a world leader in scientific research and performs this work in an environmentally responsible and safe manner.

I expect every employee, contractor, and guest to take personal responsibility for adhering to the following principles:

**Environment:** We protect the environment, conserve resources, and prevent pollution.

**Safety:** We maintain a safe workplace and we plan our work and perform it safely. We take responsibility for the safety of ourselves, coworkers, and guests.

**Security:** We protect people, property, information, computing systems, and facilities.

**Health:** We protect human health within our boundaries and in the surrounding community.

**Compliance:** We achieve and maintain compliance with applicable ESSH requirements.

**Community:** We maintain open, proactive, and constructive relationships with our employees, neighbors, regulators, DOE, and other stakeholders.

**Continual Improvement:** We continually improve ESSH performance.

In addition to my annual review of BNL’s progress on ESSH goals and adherence to this policy, I invite all interested parties to provide me with input on our performance relative to this policy, and the policy itself.

Signed: Doe Gibbs, Director
April 15, 2013

Figure 3.1. Environmental, Safety, Security, and Health Policy
control, identifying related environmental impacts, and deciding if the impacts are significant. This eva-
ulation is reviewed annually, documented, and revised as needed when (1) operational changes result in
new activities, products, and services; (2) changes in legal or other requirements affect the applicability of
the significance criteria; or (3) there are changes in the Laboratory Objectives and Performance Measures.

3.3.2 LEGAL AND OTHER REQUIREMENTS

ECRs act as each organization's first line of contact on interpreting legal and other requirements
related to the environment. To implement the compliance commitments of the ESSH Policy and to
meet its legal requirements, BNL has systems in place to review changes in federal, state, or local
environmental regulations and to communicate those changes to affected staff. Laboratory-wide
procedures for documenting these reviews and recording the actions required to ensure compliance
are available to all staff through SBMS Subject Areas (i.e., Waste, Liquid Effluents, Airborne
Emissions, etc.). The subject areas discuss how to identify the requirements, analyze the impacts,
communicate the requirements, and act to meet the requirements.

3.3.3 OBJECTIVES AND TARGETS

The EMS Representatives, with the assistance of managers and supervisors, develop their environmental
objectives and targets each year based on the organization's significant environmental aspects. The objec-
tives and targets are required to support the Laboratory's performance measures and must be consistent
with the environmental policy. Once established, the EMS Representatives must ensure that they are ac-
complished by developing an Environmental Management Program that describes the objectives and tar-
gets, develops how and when they will be met, who is responsible, and monitor and measure progress.

REFERENCES AND BIBLIOGRAPHY

4 RISK IDENTIFICATION AND ASSESSMENT

All risk areas associated with BNL's SPDES permit have been assessed for their potential to release hazardous and radiological contamination to the environment. The potential pollutants for each stormwater discharge point (recharge basin or ground surface) have been identified, as well as the BMPs in place to reduce or eliminate the potential for release. The BMP’s referenced in this plan are implemented through the line organizations and findings are tracked by the Environmental Protection Division or area-managed line organizations using Laboratory tracking systems as described in this report.

4.1 Former Hazardous Waste Management Facility (FHWMF) AREA

Stormwater drainage from the FHWMF is directed to the adjacent wetlands in this area. The FHWMF has been remediated and there are no longer any facilities or activities that occur in this area. This area was remediated to a soil cleanup level that is consistent with an “Industrial Use” standard and institutional controls are in place to prevent the migration of contaminants into uncontaminated areas. Therefore, there are no longer any identified risk areas or potential areas of concern associated with this area. (See Figure 2-3 and Appendix B, Figure FHWMF-1).

4.2 HN AREA

Recharge Basin HN consists of three basins located within the Relativistic Heavy Ion Collider (RHIC) ring. This recharge basin receives point discharges of secondary cooling water blowdown from the Alternate Gradient Synchrotron (AGS) and RHIC cooling towers. Stormwater from the developed industrial areas is also directed to this recharge basin. (See Figure 2-3).

Risks: Metal oxides, including iron oxide and lead oxide, concrete, activated metal oxides, petroleum hydrocarbons (vehicle related), and cooling tower treatment chemicals.

Potential Areas of Concern:

4.2.1 HN-1

Risk Area HN-1, the Lead Yard (Building 912), is located on the northeast corner of East 4th Road and Thompson Street. This area was formerly used by the Collider-Accelerator Department for the storage of lead bricks and other excess metal equipment. The bricks were stored inside a covered building, while other materials were stored outside on bare ground. Some materials stored in this yard were activated. In 2017, all materials, including the lead storage building, were removed from the area. The metal buildings were recycled as scrap metal at an off-site facility. Lead containing materials are currently being stored in other indoor locations. Soils within the yard are potentially contaminated, and thus could contaminate storm water with inorganic compounds (e.g., iron and lead) and/or activated materials. This area is designated as a Radioactive Material Area (RMA). (See Appendix B, Figure HN-1). The long-term plan for this area is to perform soil sampling (radiological and NYSDEC Part 375 hazardous constituents) and remediate the area as needed, thus de-posting it from a currently designated RMA.
4.2.2  HN-2

Risk Area HN-2, the Steel Yard (Building 912), is a fenced outdoor metal storage area along the eastern side of Thompson Road and extends to the East Fifth Avenue intersection. The potential exists for the contamination of stormwater with inorganic compounds caused by the continuous and gradual corrosion of metal parts exposed to the elements. Lead is not stored in this area. This area is designated as an RMA. (See Appendix B, Figure HN-2).

4.2.3  HN-3

Risk Area HN-3 is an outdoor, fenced metal storage area located east of Building 924 used for the storage of miscellaneous raw materials; wooden cable spools; cables; aluminum beam guide/pipes; A-frame rigs; shield blocks; and steel gratings, some of which are activated. This area is also designated as an RMA. (See Appendix B, Figure HN-3). The storage area on the northern side was recently consolidated and the equipment formerly there was transferred to other storage areas managed by Collider-Accelerator Department personnel.

4.2.4  HN-4

Risk Area HN-4 is an outdoor scrap metal storage area north of Building 929 and west of Building 912 covered by a steel roof that minimizes contact with storm water. Potentially activated equipment is stored in this area; however, not all equipment is stored under an enclosure. This area poses a risk for stormwater contamination by inorganic compounds (e.g., iron and steel). This area is designated as a Radioactive Materials Area. (See Appendix B, Figure HN-4).

4.2.5  HN-5

Risk Area HN-5 is used for the storage of concrete shield blocks and is located north of Building 912’s northern addition. A retention basin is located adjacent to this area on the eastern boundary. This area poses a risk for stormwater contamination with inorganic compounds (e.g., iron and lead) and/or activated materials by contact with exposed materials. This area is designated as an RMA. (See Appendix B, Figure HN-5).

4.2.6  HN-6

Risk Area HN-6 is a fenced area consisting of an outdoor equipment and cable storage area located north of Building 912 and adjacent to and west of HN-5. Activated equipment (e.g., magnets, pumps, etc.) are stored in this area. This area poses a risk for stormwater contamination with inorganic compounds (e.g., iron and lead) and/or activated materials by contact with exposed materials. This area is designated as an RMA. (See Appendix B, Figure HN-6).

4.2.7  HN-7

Risk Area HN-7 is an outdoor storage area east of Building 927 used for storing marble shield blocks. This area poses a risk for stormwater contamination with inorganic compounds (e.g., calcium carbonate. (See Appendix B, Figure HN-7).
4.2.8 HN-8

Risk Area HN-8 is a concrete shield block storage area southeast of Building 919 used to store metal and concrete shield blocks that require an activation check by Radiological Control Division (RCD) personnel before being transferred out. This area poses a risk for stormwater contamination with inorganic compounds (e.g., iron and steel) and/or activated materials by contact with exposed materials. This area is designated as an RMA. (See Appendix B, Figure HN-8).

- **BMP – Activated Materials Storage.** BNL has established practices and inspection programs which serve to minimize the contamination of stormwater from activated shielding materials in outdoor storage areas. This includes lead shielding materials NOT being stored in exterior locations.

- **BMP – Metal and Equipment Storage.** A practical management strategy in dealing with potential stormwater impacts from metal and material storage areas is based on several factors: available budgetary funding, costs to relocate, potential for reuse of the materials based on scientific needs, environmental risk, and resources.

4.3 HO AREA

Recharge basin HO consists of two recharge basins (only one is currently in use) that receive stormwater from the surrounding industrial areas and cooling water discharges from the AGS main magnet heat exchanger located in Building 911. (See Figure 2-3). To minimize the potential for stormwater contamination in HO, the evaporative cooler units located on the roof of Bldg. 911 discharge to SPDES Outfall #002 that is monitored as per the current SPDES Permit.

The buildings located in the developed industrial areas consist mostly of offices and laboratories. There are some hazardous waste storage trailers with complete secondary containment as per Suffolk Country Department of Health Services (SCDHS) requirements used for the storage of hazardous and radioactive wastes. Additionally, there are flammable storage cabinets with built-in containment located inside Buildings 815, 820, and 830 as well as throughout the entire Lab that contain small amounts of miscellaneous chemicals and oils. The materials in these storage areas are not exposed to storm water (interior location) and are not considered point sources of discharge to groundwater.

**Risks:** Iron oxide/rust, hazardous/industrial/mixed/radioactive wastes, cooling tower blowdown, and petroleum hydrocarbons (vehicle related).

**Potential Areas of Concern:**

4.3.1 HO-1 and HO-2

Risk Areas HO-1 and HO-2 are within a fenced area of the WMF located on the northern section of the HO area. The WMF consists of an office building (Building 860), a Resource Conservation and Recovery Act (RCRA)-permitted building for hazardous waste storage (Building 855 [HO-1]), a radioactive waste storage facility (Building 865 [HO-2]), and a currently unoccupied building (Building 870) used for equipment storage. (See Appendix B, Figures HO-1 and HO-2).

The existing Standard Operating Procedures (SOPs) for storage and handling implemented by BNL personnel as per the Laboratory's Spill Prevention Control & Countermeasure Plan (SPCC) Plan and Waste Management SOPs stipulated by the New York State Department of Environmental Conservation (NYSDEC) Part 373, *Hazardous Waste Storage Facility Permit*, are sufficient to prevent runoff of hazardous materials. These requirements, cou-
ple with Occupational Safety and Health Administration (OSHA) \textit{Hazard Communication Training} ("Right to Know"), are effective facility wide BMPs for the storage and handling of hazardous materials and wastes. For example, members of the Laboratory's Spill Management Team (SMT), including emergency responders, receive facility-specific training in the proper procedures for responding to spills of oils or chemicals, chemical handling, etc., as part of the Laboratory's Facility Response Plan's (FRP) Spill Management Table-Top Exercises (SMTTX). The BMPs for storage and handling of hazardous materials afford the necessary protection against accidental spills that may occur in areas that are not identified as risk areas, particularly accidental spills that could potentially impact stormwater runoff.

WMF personnel perform ES&H 1 Inspections and follow procedures for the operation of two emergency isolation gate valves in the parking lot area of Buildings 870 and 855 that can be utilized in the event of a spill from a vehicle or a waste storage building. These valves are tested regularly and are normally in the closed position.

4.3.2 \textbf{HO-3}

Risk Area HO-3 is a storage area to the North of Building 933/933A used for storing concrete shield blocks managed by CAD. The blocks are stored near the Laboratory's Facilities & Operations (F&O) Rigging Department to facilitate transfer to CAD areas. The exposed concrete blocks containing rebar are lined up in rows. This area is designated as an RMA. (See Appendix B, Figure HO-3).

4.4 \textbf{HP AREA}

The HP Area consists of the following buildings/facilities/retention basins: Buildings 487, 493, and 494. Formerly, retention basin HP received secondary non-contact cooling water from the operation of the Laboratory's Brookhaven Medical Research Reactor (BMRR). However, this reactor was decommissioned, and the radioactive source material was removed, and the reactor was placed into a cold-shutdown status as of 2003. Currently, no discharges containing potentially radioactive constituents are discharged to this basin. (See Figure 2-3).

\textbf{Risks:} \textit{Iron oxides, petroleum hydrocarbons (vehicle related), and heating/ventilation/air conditioning (HVAC) compressor oils.}

\textbf{Potential Areas of Concern:}

4.4.1 \textbf{HP-1}

Risk Area HP-1 is used by PPM Division staff for storing scrap laboratory equipment and machine shop tools, computers, disk drives, and lead containing items such as lead bricks/flanges within Buildings 493 and 494. All of this storage is within interior areas or under covered structures. Exterior storage includes open head-metal 55-gallon drums and lids that contain scrap metal; wooden pallets, scrap metal and computers, peripherals, CRTs, and other computer components being staged in bulk roll off containers prior to being shipped off-site for recycling; various laboratory equipment that cannot be stored indoors, and other miscellaneous equipment/ items. Any unused open-head metal drums being stored outside are turned upside down to prevent stormwater contamination.

The existing procedures outlined in BNL's Standards-Based Management System (SBMS) Subject Area, \textit{Storage and Handling of Hazardous and Non-Hazardous Materials}, and in the Laboratory's SPCC Plan are sufficient for preventing impacts in the form of stormwater runoff. (See Appendix B, Figure HP-1).
4.5 HS AREA

The HS Area consists of the following areas/buildings/facilities: Buildings 97, 129, 134, 400, 463, 452, 459, 460, 461, 462, 477, 478, 480, 485 (Scrap Metal Yard), 488, 490, 510, 515, 535, 555, 630, 652 (gazebo), 725 (Computational Science Initiative) and associated structures, 726, 727, 728, 734 (Interdisciplinary Science Building [ISB]), 735 (Center for Functional Nanomaterials [CFN]), 750, 901, 901A, and the F&O Transfer Station. (See Figure 2-3).

This area covers most of the “small science” areas: operational areas managed by F&O (Building 452 base locations for Energy & Utilities (EU) and Production Div. Management, several Production Division departments, including the Transfer Station; Buildings 463 (EBNN/Biology), 480 (Materials Science), 490 (EBNN/Medical), 535 (Instrumentation), 555 (BES/Chemistry), 735 (BES/CFN), 745 (BES/ISB), and 901 (ITD); a formerly used private gasoline station (Building 630) that has had all underground storage tanks removed in 2018) and is planned to house a combined 90-Day Hazardous Waste Accumulation Area, a virgin chemical storage area and an equipment storage area; and a decommissioned reactor (HFBR-Building 750) that is completely covered in a concrete domed structure.

Risks: Petroleum hydrocarbons (vehicle related), HVAC compressor oils, liquefied Freons, hazardous/mixed/radioactive wastes, forklifts, man-lifts, and cooling tower treatment chemicals.

Potential Areas of Concern:

4.5.1 HS-1

Risk Area HS-1 is a formerly used private gasoline station (Building 630) that formerly had three 8,000-gallon underground double-walled sti-P3 tanks under the eastern/rear parking lot that were removed. Additionally, there was an underground, double-walled 550-gallon used oil tank adjacent to the three gasoline tanks that was also removed. All four of these USTs were physically removed in 2018 and a formal Closure Plan was completed to document the project. The report contained analytical results from post-excavation endpoint sampling and was submitted to the NYSDEC. Currently, there is a double-walled, 1000-gallon #2 fuel oil above-ground tank for heating the building that is located in the eastern parking lot, and a double-walled 280-gallon, above-ground tank located inside the shop formerly used for bulk motor oil storage that is now empty and is now permitted to store ‘Used Oil’. Field representatives from EPD and/or Energy & Utilities inspect the above two tanks on a monthly basis, at a minimum. As stated, Bldg. 630 is scheduled to become a 90-Day Hazardous Waste Accumulation Area, a virgin chemical storage area and an equipment storage area. The Waste Area will house steel secondary containment pallets for liquid wastes-oils and the virgin chemical area will have secondary containment in the form of chemical cabinets. (See Appendix B, Figure HS-1).

4.5.2 HS-2

Risk Area HS-2 (Building 452) is a major hub for F&O’s Production Division. Laboratory and operational equipment (air handlers and condensers) containing refrigerant are staged at the southeastern section of the building for eventual Freon gas removal and compressor oil draining by Environmental Protection Agency (EPA)-licensed F&O personnel. The compressors are drained of all residual oil through the use of an oil-draining station located inside Building 452. Once the compressors have been thoroughly drained of oil, they are placed into a covered bulk container that prevents oily-stormwater runoff. These drained compressors are then transferred on-site to Building 485, a metal-roofed scrap metal storage structure with a concrete pad (see Section 4.5.3, HS-3) by BNL Grounds or Rigging Department personnel. These transfers are performed per the Property and Procurement Man-
agement Group SOP Manual (Section 380.6) and the SBMS Subject Area, *Management of Moratorium and Suspension Encumbered Metals* that includes the requirements for completing a Process Knowledge Form for Clean and Suspension Encumbered Metals. This form contains a certification for the generator to sign that the equipment contains no synthetic/petroleum oils or other hazardous materials. From Building 485, the scrap metal is picked up by a contracted scrap metal recycling vendor. In addition to the above containers for drained compressors, there are several other bulk recycling containers (roll offs) used for scrap metal staging in the form of pipes, valves, hot water heaters, and other scrap metal that do not contain residual oils, cardboard, and/or construction and demolition (C&D) debris. Liquefied Freons (at Standard Temperatures and Pressures - e.g. Freon 11 and Freon 123) are currently stored inside Building 600 within portable secondary containment pallets to prevent any releases of the liquified/low-pressure freons. Gaseous/high pressure Freons are stored inside a contained HAZ-STOR™ Shed with steel floor gratings located to the south of Building 652. (See Appendix B, Figure HS-2).

### 4.5.3 HS-3

Risk Area HS-3, the Scrap Metal Yard (Building 485), is a fenced-in concrete slab at grade with barricade push walls and a covered roof to protect scrap metal items being staged for pickup by a vendor for off-site recycling. This yard is always locked to prevent unauthorized materials from being placed there without adequate controls. The location of this yard is south of the National Synchrotron Light Source II (NSLS II) Buildings. (See Appendix B, Figure HS-3).

**BMP** – BNL has a Scrap Yard Policy to ensure that necessary controls are implemented to prevent unacceptable items from entering the scrap yard and subsequently being released to the public for recycling or reuse. Completion of a Process Knowledge Certification Form for Suspect and Suspension Encumbered Metals, as discussed in BNL's SBMS Subject Area, *Management of Moratorium and Suspension Encumbered Metals*, and the checking of scrap metal by Property and Procurement Management (PPM) ensures that hazardous materials in the form of lead, petroleum/synthetic oils, mercury, Freons, asbestos, and other hazardous/toxic materials are not stored unprotected from the elements. This prevents releases and runoff from these materials to the environment. Refer to Section 5.8 for information on the process for the temporary staging of scrap metal throughout the Laboratory within vendor and BNL-owned scrap metal containers.

Prior to disposal of metals at the scrap yard, the scrap-metal hauling vehicles must pass through the on-site Vehicle Radiation Monitor (VRM). The VRM detects specific radiological contamination, if present, although this is unlikely because RCD personnel perform radiological surveys on items present within Radiologically Controlled areas requiring activation checks. The VRM alarms trigger a response from RCD personnel who determine whether decontamination is required or is not required in the event the alarm is due to Naturally Occurring Radioactive Material (NORM). These controls help to minimize the contamination of stormwater and subsequent runoff from the operation of the scrap yard.

BNL stores the bulk of its clean/non-radioactive, non-hazardous scrap metal under a roofed structure in Building 485, whereas lead is stored inside Building 493 within a bin. These materials must be free of residual chemical, petroleum products, and gases that may cause environmental releases prior to being transported off site. Therefore, they are monitored as part of the Laboratory’s Environmental Management Systems in place and there is only a small potential that stormwater contamination would occur. There are, however, several operational areas that have roll-off containers without tops that are used for the storage of clean scrap metal. Runoff from these containers could cause iron oxide/rust contamination to occur. These roll-offs are staged for accumulation prior to being picked up by a scrap metal vendor for off-site recycling as per relevant PPM Procedures.

The area to the West of Bldg. 485 that has concrete pads and were formerly used as foundations for demolished buildings is currently being used as a storage area for abandoned vehicles, excessed utility vehicles, drained lab
equipment, drained HVAC type equipment and miscellaneous operational equipment. Additionally, there are Cassone-type closed trailers located on these pads that are used for equipment storage.

4.5.4 HS-4

Risk area HS-4 is a transfer station managed by F&O's Production Division and is used as a staging area for construction and demolition debris consolidation that consists primarily of scrap miscellaneous wood, pallets, and other wooden items. Other items stored in this station include trench boxes, construction-related items, a bulldozer, heavy equipment trailers, empty municipal garbage and recycling dumpsters (1 and 3 cubic yards), plastic 30-gallon garbage containers, vendor-owned roll-offs for bulk plastic and C&D debris storage prior to off-site recycling or disposal, open storage bins for clean sand, various diameter gravel used for road sub-base material and mulch, and a “tent” structure with walls and a roof used for storing lawn mowing equipment and other lawn maintenance equipment in colder weather and snow plows and associated snow-moving equipment in the summer. This tent structure has a gravel floor on top of a polyethylene liner to prevent spills of petroleum from reaching the soil. The lawn mowers and other lawn-related equipment are drained of fuel before being placed in storage. Additionally, there is a completely enclosed, bulk roll-off container owned by a vendor that is used for the storage of on-site generated asbestos containing materials. This container is used by the Lab’s NYS Dept. of Labor-licensed asbestos handlers for the storage of Asbestos Containing Materials (ACM) prior to off-site disposal. (See Appendix B, Figure HS-4).

4.6 HT AREA

Recharge basin HT receives stormwater drainage from the developed areas northwest of the AGS and a point discharge of cooling water blowdown from the Linear Accelerator (Linac). Unused and badly rusted structures are present in this area, such as the hydrogen compression sphere system. (See Figure 2-3).

**Risks:** Iron oxide, cooling tower blowdown, and various oils/petroleum.

**Potential Areas of Concern:**

4.6.1 HT-1

Risk Area HT-1, CAD’s 90-Day Radioactive Waste Accumulation Area, and Mixed and Hazardous Waste Accumulation Areas, is fenced and houses steel bins (B52’s and B-24’s) that are completely enclosed and provide secondary containment for Radioactive Waste. This area is inspected on a monthly basis, at a minimum, and radioactive material is not exposed to the elements. The radioactive wastes are then transferred to the WMF for proper disposal. The Waste SBMS Subject Area (Radioactive Waste subsection) is followed for the overall management of these areas. These areas are contained inside HAZ-STOR™ Sheds and/or covered.

The potential exists in Risk Area HT-1 for the contamination of stormwater with inorganic compounds caused by the continuous and gradual corrosion of metal parts exposed to stormwater. The current BMPs discussed for metal and equipment storage areas which discharge stormwater to Recharge Basin HT are also appropriate for the Recharge Basin HT risk areas. (See Appendix B, Figure HT-1).

4.7 HW AREA

The HW Area consists of the following areas/buildings/facilities: Buildings 479, 495, 496, 498, 486, 600, ST658, ST650, 98 (Warehouse), 740-745 (NSLS-II), and storage trailers. The primary occupants of the operational areas are F&O Production Division’s Fabrication Services and EU Division on the western divide, and Photon Sci-
ences on the eastern divide. There are open areas, catch basins, drywells, and manholes that capture stormwater. Recharge basin HW receives stormwater from these areas, including the NSLS-II. The activities performed in the Fabrication Services Shop (Building 479) include design and machining of specialized parts for scientific apparatus, existing equipment repairs, and the cleaning and machining of feed stock materials (low grade steel, copper, stainless steel, and aluminum) for specialized item fabrication. Building 479 has many oil-containing machine shop-related items stored there including water-soluble Blasocut™ lubrication oils for the lathes, light grade oils for machining, etc. (See Figure 2-3). The turbo-centrifugal oil separator for Blasocut recycling is contained inside a building (Bldg. 498) that has built-in secondary containment with steel diamond plate floors.

**Risks:** Ethylene/propylene glycol and petroleum hydrocarbons (vehicle related), equipment storage, and iron oxide/rust.

**BMP** – Oil spills from fabrication-related equipment are routinely cleaned up by Fabrication Services personnel to prevent oil releases from the open bay doors that could provide pathways for machining fluids to enter the ground via an accidental spill during use or handling. Shop personnel routinely use a sweeping compound suited for oil as part of good housekeeping practices. Risk Areas HW-2 through HW-6 consist of several outdoor active storage and scrap material areas located in and around F&O’s Fabrication Services area in Building 479.

**Potential Areas of Concern:**

4.7.1 **HW-1**

Risk Area HW-1 is the NSLS II parking lots for employee and Laboratory-owned vehicles. Typical fluids present within vehicles such as antifreeze, motor oil, diesel, and gasoline have the potential for release in this area. (See Appendix B, Figure HW-1).

4.7.2 **HW-2**

Risk Area HW-2 is a storage area south of Buildings 498 and 495 that includes a carbon steel (low grade) and stainless steel lay-down area, fabricated equipment for ongoing projects, and propane cylinder storage area used for forklifts. (See Appendix B, Figure HW-2).

4.7.3 **HW-3**

Risk Area HW-3 is a major lay-down area south of Building 479 that is “L” shaped where items are stored, such as covered steel bins, pallets, welding gas cylinders, welding trailers, steel/aluminum stock, wooden pallets, storage bins for used garnet, steel and aluminum bar stock, and other miscellaneous metal items. There is also a bulk scrap metal container present in the rear of the building owned by the scrap metal contractor who removes the container for off-site recycling. (See Appendix B, Figure HW-3).

4.7.4 **HW-4**

Risk Area HW-4, Building 486, is a locked building that is used for the storage of copper items, plastic used for printed circuit boards, and various other equipment. Covered steel bins containing various metal shavings and filings with residual water-soluble oil are stored within a concrete and diamond-steel lined berm (“Chip Berm”). The Chip Berm is inspected monthly, at a minimum. (See Appendix B, Figure HW-4).
To prevent the Chip Berm from being a source of contamination, it is drained of accumulated storm-water under the guidance of F&O Procedure DF-ESH-009, *Draining of Secondary Containment*, to allow for containment volume in the event of an oil release from one of the chip bins. Under the supervision of Fabrication Services, an EPD field representative routinely inspects the management of the Chip Berm and for spills of oil to the environment.

**4.7.5 HW-5**

Risk Area HW-5, Building 479, has a relatively new drainage area southwest of the building in a vegetated area that is the receptor for the front (north) and side (west) parking lot runoff. Potential contaminants are vehicle-related fluids such as motor oils and propylene/ethylene glycol. However, any spills to the soil are reported to Fire Rescue and cleaned up by the F&O Roads-Grounds Dept. in coordination with EPD’s Spill Management Team (See Appendix B, Figure HW-5).

**4.7.6 HW-6**

Risk Area HW-6, Buildings 495 and 498, are accessory buildings to Building 479 and are associated with discrete operations. Building 498 contains large stainless-steel tanks that contain non-hazardous cleaning solutions for cleaning fabricated parts that have light machine oil coatings. This building has a concrete floor that is epoxy coated. Building 495 is the Coolant Recycling Building that houses an oil-water evaporator (315 gallons) for oily water solutions (mop cleanings) with trace metal contents not dischargeable to the sanitary system. There is also a centrifugal separator for the recycling of the water-soluble cutting oil (Blasocut™). Oil in bulk containers within racks are also located in this building. The building is completely contained within a concrete structure that has a diamond plate-welded lined floor containment structure. There is also an exterior located structure to the South of Building 495 that is a roofed structure with epoxy-coated concrete containment walls and a top grating. This structure is used for the storage of 55-gallon drums and bulk containers of used oil-water, oily debris, and sludge from the oil recycling process in Building 495 and is inspected on a monthly basis. Both buildings were constructed as per SCDHS Article 12 requirements. (See Appendix B, Figure HW-6).

**4.7.7 HW-7**

Risk Area HW-7, the Central Chilled Water Facility (CWF) (Building 600), houses the chillers used for HVAC-related chilled water systems. These chillers contain both gaseous and liquid Freon and there is a storage area in the southern section of the building with secondary containment for low-pressure liquid Freon-11 and liquid Freon-123. The two Freons are liquids at standard temperature and pressure and are stored on plastic secondary containment pallets with an inventory system used to track usage and inventory to prevent any releases. The other chillers contain Freon R-134A, a gas at standard temperatures and pressures. Additionally, there are double walled cooling water treatment chemical tanks ranging in size from 40- to 165-gallons inside the building that have secondary containment. Some tanks that are double-walled also have tertiary containment in the form of an outer stainless steel container. These tanks are inspected on a monthly basis and any issues are tracked using the MAXIMO Work Order Tracking System. (See Appendix B, Figure HW-7).

**4.8 HX AREA**

The HX Area consists of the following areas/buildings/facilities: Water Treatment Plant (Buildings 624, 646, and 641, including associated pump houses), water storage tanks, stripping tower, the Building 902 cooling water tower, and portions of Building 902 and the HX retention basin. (See Figure 2-3).

Risks: *Lime/calcium carbonate containing wastewater from softening process, sodium hypochlorite disinfectant.*
Potential Areas of Concern:

4.8.1 HX-1

The HX-1 Area is an exterior pipe storage area just north of Building 646 (Stripping Tower) where unused PVC, cast iron, carbon steel piping, and fittings are stored. Stormwater runoff from this material could occur, however, the contaminants have a small probability of reaching the retention basin as there are no catch basins in this area. Runoff would likely be confined to asphalt parking areas. (See Appendix B, Figure HX-1).

4.8.2 HX-2

The HX-2 Area, the Water Treatment Plant (WTP) (Building 624), has a potential source of contamination in the form of lime and sodium hypochlorite (15%) solutions that are stored in bulk quantities. The HX retention basin receives filter backwash water from the WTP and rainfall runoff by sheet-flow from adjacent developed areas. There are NYSDEC-registered Chemical Bulk Storage tanks stored inside the WTP Building; however, these tanks have double walls, secondary containment (epoxy-coated concrete floor), are inspected monthly, have overfill prevention alarms, electronic level gauges, and the floor drain where the tanks are located is plugged to prevent releases. The WTP also stores PVC water pipes, cast iron fire hydrants, steel pipes, and vehicles in exterior areas near the plant. There are no stormwater catch basins connected to this recharge basin; therefore, contaminants from sheet flow entering the retention basin would be minimal. Runoff would likely be confined to asphalt parking areas. (See Appendix B, Figure HX-2).

4.9 Major Petroleum Facility (MPF) AREA

The MPF Area includes bulk fuel oil storage risk areas associated with the operation of a DEC-categorized, MPF at BNL. This area includes outdoor storage for five tanks with one tank (Tank No. 9) being empty and formally placed in a Permanently Out-Of-Service condition. These tanks comprise the Major Oil Storage facility (MOSF) with a total capacity of in-service tanks of 1.9 million gallons that support the Central Steam Facility (CSF), Building 610. All tanks are aboveground and three of the tanks contain No. 6 fuel oil and two contain No. 2 fuel oil. Additionally, there is a large 4,000-gallon double walled, aboveground Lube-Cube tank for the CSF’s emergency generator and a 1,000-gallon, double-walled aboveground tank containing B-20 (biofuel). Secondary containment is provided for bulk fuel truck loading/unloading and the above biofuel tank via the use of Building 639, a roofed structure with epoxy-coated concrete containment, and a trench drain with an associated valve for the draining of stormwater. These tanks are equipped with tank level indicators and high-level alarms in order to prevent overfills. A cathodic protection system (impressed current) is also installed on the large bulk tanks. These tanks are inspected at least once per shift by trained employees who are licensed stationary engineers.

The MPF tanks are afforded secondary containment within Geosynthetic Clay Lined berms sealed via the use of impervious soil-clay layers. The berms for Tank Nos. 4 and 10 have been recently rehabilitated and flood tested with positive results. The berms for Tank Nos. 3 and 5/6 (shared berm) are also flood tested as per the schedule referenced in the Laboratory’s NYSDEC MPF License. Tank No 9 has been cleaned of all residual #6 fuel oil and was placed in a permanently out-of-service condition in 2020. Stormwater that accumulates in the tank berms is visually inspected, and if a visual sheen does not exist, permission is granted to drain the berm to the BNL sanitary sewer as per F&O Procedure DF-ESH-009, Draining of Secondary Containment.

Stormwater leaves this area primarily by sheet flow. The area has sedimentation collection basins with rip-rap linings in order to capture any stormwater runoff in the area. There are catch basins in the vicinity of the MPF and the CSF that capture runoff from this area. These catch basins are connected to the MPF's 18-inch storm sewer and
discharge to the surface at a location to the east of Risk Area MPF. (See Appendix B, Figure MPF-1). (See Figures 2-2 and 2-3).

**Risks:** Petroleum fuel oil (No. 2, No. 6, and B-20 fuels) and industrial wastes. However, there are no potential areas of concern because all tanks have secondary containment.

### 4.10 SSSG AREA

The SSSG area is comprised of the following areas/buildings/facilities: Building 30, 50, 321, 326, 397 (sand/salt dome), 406, 412 (4-Poster station, fertilizer and landscape-related equipment storage), 423, 339, STO-651, Cassone-style steel storage trailers, and heavy equipment vehicle parking and storage. There are open areas, catch basins, and drywells that capture the sheet flow stormwater that generally flows towards the southwest. (See Figure 2-3).

**Risks:** Petroleum hydrocarbons (vehicle related), E-85 fuel, gasoline, diesel fuel, and No.2 fuel oil.

**Potential Areas of Concern:**

#### 4.10.1 SSSG-1

Risk area SSSG-1 is a vehicle wash station comprised of a concrete bermed drive-on area that has a water hose, a ground-fault circuit interrupter (GFCI) outlet, and an oil-water-separator (OWS) that is located South of Bldg. 321 in the heavy equipment vehicle parking area. The OWS is a three-compartment underground structure with a capacity of 1,000 gallons (4’ diameter by 10.75’ long) that is connected to the Site Sanitary System. The manufacturer is RAM Environmental Technologies Inc. and the Model No. is RAM-TBI-100 (UL approved). There is a Preventative Maintenance (PM) established for opening the influent chamber of the OWS and for removing any debris-sludge-dirt. The OWS was last cleaned out in 2020 and the resulting sludge was properly disposed of off-site through the Laboratory’s Waste Management Division.

There are three compartments in this OWS that are baffled and have turndowns in order to prevent oils/greases from entering the Sanitary System. The vehicle washing station is used by F&O's Production Division personnel for cleaning off grit, oils, salt, dirt, and dust from Laboratory vehicles. Adjacent to this OWS is also a parking/storage area on an asphalt-macadam area managed by the Heavy Equipment Mechanic Operator (HEMO) Group for heavy equipment parking/storage that includes front loaders, backhoes, dump trailers, street sweepers, dump trucks, vacuum trailers, excavators, skid steers, payloaders, load luggers, bulldozers, and other miscellaneous equipment. The area south of Building 339 has a fenced materials storage area that has galvanized fencing, forklift items, painted and unpainted steel plow components, steel spreaders, concrete masonry blocks, cast iron manhole covers, and framing and plastic items such as fencing. (See Appendix B, Figure SSSG-1).

#### 4.10.2 SSSG-2

Risk Area SSSG-2 (Building 397) is a wooden roofed structure that is used for the storage of road salt-sand for application on the Laboratory’s roads and sidewalks during the colder weather for personnel protection to prevent slips, trips, and falls. Runoff is minimized by the structure itself, as well as the asphalt-covered floor of the dome. (See Appendix B, Figure SSSG-2).
4.10.3 SSSG-3

Risk Area SSSG-3 (STO 651) is a modified polyamine epoxy-lined concrete containment berm that serves as secondary containment for (2) 5,000-gallon and (1) 10,000-gallon diesel fuel storage tanks. This berm has recently been rehabilitated in 2019 and then flood tested with positive results. These NYSDEC-registered steel tanks on cradles are inspected on a monthly basis and site personnel monitor this area daily as the fuel dispenser is located within the Truck/Load/Unload containment area that is adjacent to the above tanks and this dispenser is used frequently. Tank Nos. 651-03 and 651-04 have been thoroughly cleaned and vacuum tested in 2020, and their digital capacity gauges have been recalibrated. F&O's HEMO Group personnel contact the F&O ECR in order to inspect any accumulated ponded stormwater present within the bermed tank area and Load/Unload areas for signs of oil spills/leaks. If an oil sheen or an oil spill in the berm is found, the F&O ECR contacts F&O personnel who make arrangements for cleanup. Oil sheens from vehicle drips are usually handled by F&O Personnel using oil-adsorbent pads. In any event, accumulated liquids without traces of oil are pumped out of the above berm or Load/Unload Area into the Sanitary System under the requirements of F&O Procedure DF-ESH-009, Draining of Secondary Containment, including an inspection by EPD personnel prior to discharge. (See Appendix B, Figure SSSG-3).

BMP – Outdoor Handling of Fuel. Operators working in Risk Areas SSSG-1 through SSSG-3 also adhere to Outdoor Handling of Fuel Oils by conducting loading/unloading of diesel and fuel oils under cover; avoiding transferring material in close proximity to catch basin or drywells; using containment trays under transfer hoses for fuel; and containing and absorbing leaks during transfers.

4.10.4 SSSG-4

Risk Area SSSG-4 (Building 321) contains a Pesticide Storage Room used for restricted and non-restricted pesticides, insecticides, herbicides, fungicides, rodenticides, and tickicide storage. Liquid pesticides are kept within secondary containment trays or other devices to prevent releases to the environment. Only DEC-certified Pesticide Applicators are permitted to apply the materials, which are mixed inside the building with proper ventilation and containment in order to prevent spills. Part of the applicator’s training is to strictly adhere to the pesticide labels that include the avoidance and prevention of runoff through the use of proper usage and spill containment devices. (See Appendix B, Figure SSSG-4).

4.10.5 SSSG-5

Risk Area SSSG-5 (Building 423) has two NYSDEC-registered underground fuel storage tanks (8,000 gallons each) that separately store E-85 and gasoline for Laboratory vehicles that are owned by F&O's Guest Services Group and inspected by one of the certified UST A/B Operators. There are also two fuel dispensers with sumps that drain back to the UST manholes on a concrete island just west of Building 423. Motor Pool personnel monitor the underground tanks for leaks using the Veeder Root Automatic Tank Gauging (ATG) System and use 10-day inventory logs for the E-85 and gasoline tanks. If discrepancies arise, F&O's Motor Pool personnel inform Guest Services and EPD personnel of a potential leak from the tank(s). Then, an investigation is initiated to ascertain if the UST is actually leaking or the leak detection equipment is malfunctioning. If the UST is found to be leaking, the release would be reported as per EPD Spill Notification Procedure and the UST would be emptied. Additionally, there is an underground, EPA-exempt #2 fuel oil tank (3,000-gallon capacity) used for on-site heating oil consumption for Building 423. The underground fuel oil tank is inspected by F&O's Steam Shop (EU Division) personnel who check the USTs for leaks using the Veeder Root ATG system and visual means on a monthly basis. (See Appendix B, Figure SSSG-5).
4.10.6 SSSG-6

Risk Area SSSG-6, managed by F&O's Motor Pool consists of two NYSDEC-registered aboveground double-walled, "Lube Cube" tanks (500 gallons each) that contain motor oil. These tanks reside within the western portion of Building 423 and are inspected on a monthly basis. Steel drums (55-gallons each) containing virgin products such as propylene and ethylene glycol, antifreeze, motor oil, windshield washer fluid, and mineral spirits are stored inside the building on top of steel secondary containment pallets with gratings that have enough containment for the largest product container as per SCDHS Article 12 requirements. There is also an exterior, locked metal shed that contains an epoxy-lined concrete secondary containment structure used to house a 275-gallon NYSDEC-registered "Used Oil' 'Load Lugger' tank. Used oil (on-specification) from vehicle maintenance is stored inside the tank. A used oil reprocessing vendor removes the oil regularly and recycles/reprocesses it off site.

The eastern portion of Building 423, where heavy equipment is serviced, houses virgin motor oil drums on a rack that has a steel secondary containment structure, also as per SCDHS requirements. Similar activities are conducted in this portion of the building, such as the servicing of heavy equipment via oil draining and containment via the use of other secondary containment items in order to prevent spills. There is a bulk, NYSDEC-registered storage tank – Load Lugger that is used for storing this type of motor oil behind/West of the HEMO’s high-bay garage. Both F&O's Motor Pool and Heavy Equipment Shop personnel work within garage-style bays (Building 423) that have aluminum overhead doors. Any spills or leaks from vehicles are contained within oil draining caddies or plastic trays or other means to prevent releases to the environment. (See Appendix B, Figure SSSG-6).

4.10.7 SSSG-7

Risk Area SSSG-7 is a NYSDEC-registered underground diesel fuel oil tank with a capacity of 1,000 gallons for the generator associated with the Laboratory Protection’s police barracks (Building 50). This tank has overfill alarms and cathodic protection (sacrificial anodes). In addition, there is a fuel-water sensor inside the manhole fill sump for the associated underground fuel storage tank piping. This sensor monitors for fuel leaks from supply lines for the UST. There is an ATG inside Building 50 for leak monitoring of the tank and fuel lines and there is an overfill alarm (visual and audible) on the exterior. HEMO personnel inspect this tank, including performing the weekly and monthly monitoring. They also infrequently fill the tank with diesel fuel when required. (See Appendix B, Figure SSSG-8).

4.10.8 SSSG-8

Risk Area SSSG-8 is a large 2,000-gallon NYSDEC-registered aboveground #2 fuel oil tank at the rear of Building 30 (Brookhaven Center). This Lube-Cube tank is a state-of-the-art, double-walled tank that is equipped with spill prevention devices including an interstitial space monitoring port, tank gauge, spill box, and a whistle vent. EU personnel inspect this tank, including providing oversight during refueling by a contract vendor and performing monthly inspections. (See Appendix B, Figure SSSG-8).

☑ BMP – Deliveries of fuel oil by vendors is performed under the direction of F&O employees and is closely monitored for spills and emergencies. For the Laboratory’s Underground Storage Tanks, personnel are required to verify ullage amounts by “sticking the tank” and by using the Automatic Tank Gauge (ATG) in order to prevent overfills.
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5 LABORATORY-WIDE BEST MANAGEMENT PRACTICES

Housekeeping considerations at BNL include expediting the cleanup of spilled material, neat and orderly storage of workstations and bulk stored materials, maintenance of adequate aisle space, and the prevention of material accumulation. Good housekeeping requires the maintenance of areas which can cause pollutants to enter storm water systems. The most effective first step towards preventing pollution in stormwater from BNL facilities involves common sense in establishing basic housekeeping procedures.

5.1 GOOD HOUSEKEEPING STANDARDS

BNL's Housekeeping Standard, developed by the Laboratory's SHSD, applies to the entire facility, including office, laboratory, experimental, industrial, and construction spaces and sites. The standard reduces the likeliness of injuries and near misses, as well as environmental releases. All employees are expected to perform their tasks using good housekeeping standards. Housekeeping is a topic that is looked at by ES&H Professionals during routine Tier 1’s.

5.2 POLLUTION PREVENTION

BNL also has a successful Pollution Prevention (P2) Program in place that incorporates pollution prevention opportunities, recycling programs, conservation initiatives, and waste reduction goals. Under this program, significant reductions in waste volumes and costs have been achieved. The following P2 and waste reduction criteria have been incorporated into the DOE contract with BSA, the Performance Evaluation Management Plan associated with the Laboratory's operating contract with DOE, and BNL's Site Sustainability Plan:

- Eliminate or reduce emissions, effluents, and waste at the source where possible, and ensure they are "As Low As Reasonably Achievable" (ALARA).
- Procure environmentally preferable products (e.g., biobased and low toxicity products, Green Seal cleaning chemicals, etc.).
- Conserve natural resources and energy.
- Reuse and recycle materials.
- Achieve or exceed BNL/DOE waste minimization, P2, recycling, and affirmative procurement goals.
- Comply with applicable requirements (e.g., New York State Hazardous Waste Reduction Goal, Executive orders, etc.).
- Reduce waste management costs.
- Implement P2 projects.
- Improve employee and community awareness of P2 goals, plan, and progress.

BNL areas are monitored for housekeeping practices during regular “Tier 1” inspections by Environmental, Waste, Safety, Industrial Hygiene, Radiological Control, and Facility Management professionals that cover exterior storage areas, exterior buildings (e.g. HAZ-STOR™ Sheds), interior storage, and office/administrative areas. Additionally, employees who perform various tasks involving equipment that store/use petroleum or chemicals (e.g., Gensets, bulk fuel storage tanks, water treatment tanks, etc.) complete Storage Facility Inspection and Hazardous Waste Operations and Emergency Response (HAZWOPER) training. Additionally, members of the Spill Management Team receive Incident Command System training and participate in mock drills involving spills/releases/leaks from bulk petroleum and chemical storage tanks and fuel containing equipment. Tier 1 findings are tracked in IOPS or an al-
ternative tracking system and are either remedied at the time of the inspection or work orders are placed to remedy the finding(s).

5.3 PREVENTATIVE MAINTENANCE PROGRAM

Preventive maintenance involves the regular inspection and repair of BNL equipment and structures that, if malfunctioning, could result in a release of pollutants to stormwater discharges. The Preventative Maintenance (PM) Program at the Laboratory is used by the Facilities and Operations Directorate for F&O owned assets and is also used for non-F&O Divisions when work is performed by F&O personnel. The PM Program is managed by the Facility Operations Center (FOC), utilizing the MAXIMO Computerized Maintenance Management System (CMMS). Within the CMMS database, PM work orders are scheduled, released, closed, edited for changes, and labor rates is posted. PM is a predetermined job plan developed for a specific item and is performed on a regularly scheduled basis. PM job plans include tank and equipment inspections, tank testing, tank servicing, reporting methods, adjustments and calibration, and fire alarm testing.

The PM Coordinator and the Facility Project Manager (FPM) are jointly responsible for determining the items to be included in the PM Program, the individual job plan, and the scheduled frequency. Included in the considerations for determining job plans are personnel and environmental safety.

Primary components of the BNL PM program, as it relates to release prevention, include the following types of equipment and systems:

- Wastewater treatment plant operation and support equipment (treated wastewater is discharged to groundwater via recharge beds).
- Aboveground and underground petroleum storage tank inspections and pipelines, checking of containment areas that are manually drained to stormwater or sanitary conveyances after inspection by EPD personnel for and approval via F&O Procedure DF-ESH-009) including checking tank gauges, spill boxes, overfill alarms, and interstitial ports that will prevent leaks of petroleum into the environment.
- Cooling tower cleanings - most process and some of the mechanical (e.g., air conditioning) that discharge their blowdown to the site stormwater system.
- Air conditioning water-cooled package units (discharged periodically to stormwater conveyances).
- Air compressors (discharge to stormwater, ground, and/or the sanitary sewer).
- Emergency generators.
- Steam traps.

5.3.1 WASTEWATER TREATMENT PLANT (WWTP) OPERATION

BNL operates a 2.3 million gallon-per-day wastewater treatment facility with treated effluent that is discharged to groundwater via recharge basins. Wastewater flow to the treatment plant consists of process, cooling water, and residential wastewater streams. The WWTP is constantly monitored to ensure proper equipment operation. Bar screens and influent screens are cleaned regularly, and equipment is replaced and upgraded as operations necessitate.

Approximately, one-hour up-flow from the WWTP is Building 569, which houses continuous recorded monitoring for pH, conductivity, and radiation. This Building has the capability to signal alarms if any of these parameters are exceeded. In the event of a process emergency, flow can be diverted to one of the two STP’s effluent holding ponds that have an approximate three (3) million-gallon capacity for each one.
5.3.2 Aboveground and Underground Petroleum Storage Tanks and Pipelines

Tank and pipe systems at BNL are contained inside and outside buildings, and contamination of stormwater from leaks or spills (other than catastrophic failure) is unlikely. These systems are regularly inspected, tested, and maintained as part of BNL's Spill Prevention Control and Countermeasure (SPCC) Plan.

Aboveground and underground petroleum storage tanks and pipelines are inspected and tested in accordance with 6 NYCRR 613 and Suffolk County Article 12 requirements. Aboveground tank inspection forms are completed and include checks on tanks, piping and valves, lighting, level indicators, leak detectors, alarms, etc. Alarms for these tanks include local alarms, Central Steam Facility alarms, and alarms that go through the Shift Supervisor (Building 600) and/or the CAS (Central Alarm Station) during off-hours in order to provide 24-hour coverage periods.

5.3.3 Cooling Towers

Thirteen (13) of the thirty (30) cooling towers (eight are out-of-service) at BNL currently discharge their blowdown to retention basins as per the current SPDES Permit. The balance of the towers' blowdown streams discharge to the sanitary sewer. The cooling tower blowdown effluent contains trace amounts of microbiocides, disinfectants, caustic residue, and corrosion inhibitors that are not consumed by the systems. Most of the towers have automatic controllers that add water treatment chemicals (WTCs) in measured doses that vary seasonally and vary according to loads of the systems. These controllers facilitate the proper dosage of the WTCs to prevent overdosing and the controller’s operation is monitored by a trained vendor that is overseen by EU Division personnel.

5.4 Inspections and Recordkeeping

Inspections provide an ongoing method to detect and identify sources of actual or potential environmental releases. Inspections are particularly effective in evaluating the Laboratory's housekeeping practices and PM program. Routine inspections of facilities and grounds (e.g., outdoor storage areas) are conducted by individual department and Tier I Safety Inspection Committees. These committees are comprised of Designated Space managers; Facility and Operator personnel; Environmental, Safety, and Industrial Hygiene personnel; and Radiological Control Division personnel. In addition, Subject Matter Experts (SMEs) from EPD may also be requested to participate in the inspections to provide technical support to facility operations. One purpose of these inspections is to identify actual and potential BMP issues and to identify areas where potential occurrences could occur.

5.4.1 Tier I Safety Inspections

Tier I Safety Inspections are performed to communicate and track to closure environment, safety, security, health, and quality deficiencies and observations identified during a walk-through inspection of a work area. Any condition that may result in imminent danger to personnel, equipment, or the environment is immediately addressed via the MAXIMO Work Order System. There are local and institutional Tier 1 tracking databases that are used for tracking/trending of findings. The Safety and Health Services Division (SHSD) tracking system can be used to create bar graphs/pie charts or other charts to facilitate data trending. In addition, there are checklists for documenting deficiencies found on Tier 1 Inspections that include the following:

- **Environmental**: Hazardous materials stored near floor drains, sinks, exterior areas, evidence of spills, secondary containment, mismanaged wastes, tank management, and leaking tanks/pipes/vessels.
- **Waste:** 90-Day Hazardous Waste Accumulation Areas, secondary containment, labeled containers, container condition, inspection logs, segregation/compatibility of wastes, proximity of spill response equipment, etc.
- **Storage of Hazardous and Non-hazardous Materials:** Evaluation of tank condition, overfill alarms/vents, spill prevention devices, inspection logs, proper 55-gallon drum and other container storage, and proximity of spill response equipment.
- **Material Handling Areas including Chemical Product Storage Areas:** Container labeling, container/tank integrity, leak prevention devices, segregation/compatibility of materials, potential for unintentional disturbance, appropriate warning signs, proximity of spill response equipment, and inappropriate stacking of containers.
- **Housekeeping:** Prompt removal of spilled material, neat and orderly storage of materials, unidentified/orphaned containers, and adequate aisle space.
- **Material Transfer Locations:** Evidence of spillage, adequate spill protection, careful material handling, and leaking pipes/hoses/valves/fitting.
- **Fire Safety:** Flammable and combustible material storage, flammable storage cabinets, etc.
- **Process Operations:** Discharges to sanitary sewer and machine vault/pit standing oil.
- **Spill Receptors:** Adequate diversion/protection from potential spills.
- **Site Drainage Areas and Parking:** Evidence of oil sheen and spillage.
- **Construction/Demolition Projects:** All the above issues.

Tier 1 deficiencies are documented and tracked in IOPS or a local tracking system by the responsible department and certain findings related to environmental topics, such as bulk storage tank management/maintenance/testing, are reviewed by EPD prior to closing the action as completed. Actions relating to the findings are tracked within the MAXIMO database and the work orders are completed and maintained as per SBMS Records Management requirements. Departments that own particular areas/buildings/storage areas are responsible for resolving issues related to BMP concerns. For incidents that involve spills of petroleum or other hazardous substances, including reportable incidents, EPD ensures that these incidents are reported to the proper regulatory authorities including DOE, U.S. EPA, NYSDEC, and SCDHS as required. Closure of these types of incidents are handled through EPD and Spill Reporting databases are utilized. For certain incidents meeting the DOE Occurrence Reporting System (ORPS) threshold criteria, the facility owner must call the ORPS categorizer within the required time frame. Target interim and completion dates for all corrective actions are set in ORPS. Projects involving spills of petroleum and hazardous substances are handled by Fire Rescue, F&O, EPD and S&HS using the Incident Command System (ICS) protocols with the assistance of the Emergency Management (EM) Division. The above projects usually involve outside regulatory authorities that set closure criteria and ensure that cleanup criteria are met before closing the spill/release.

### 5.4.2 STORAGE AND TRANSFER OF HAZARDOUS AND NONHAZARDOUS MATERIALS INSPECTIONS

As discussed in BNL’s Subject Area, Storage and Transfer of Hazardous and Nonhazardous Materials, requirements for owners of outdoor storage/work areas (e.g., excess material storage yards, welding areas, shielding storage areas) that store materials that can deleteriously impact site run-off, soils, and stormwater recharge basins are identified to ensure that best management practices are implemented. This includes quarterly inspections of identified areas for the following:

- Inspection for evidence of excessive corrosion and work by-products.
- Areas expected to be clean at all times.
- Dumpsters and waste receptacles that have the potential to leak oils or any other hazardous materials.
- Exterior work areas involving hazardous materials-oils for proper containment and cleanliness.
• Equipment, such as forklifts and cranes, are inspected routinely for evidence of leaks and are routinely parked on pavement when possible.

• Storage of liquids conforming to the requirements for portable containers referenced in relevant SBMS Subject Areas.

• Large outdoor, unprotected storage areas that cannot be protected from potential stormwater runoff may be subject to periodic environmental monitoring (e.g., sampled to ensure there are no environmental impacts) (See Appendix C, Checklist for Inspection of Other Outdoor Storage/Work Areas).  

5.4.3 REGULATORY INSPECTIONS

The Laboratory undergoes regular compliance inspections by local, state, and federal regulatory agencies. These compliance inspections include recharge basins, the STP, the potable water system, air emission sources, the MPF and the numerous petroleum tanks located throughout the Lab, chemical bulk storage facilities, and RCRA Hazardous Waste Storage and Accumulation Area inspections.

5.5 BMP INCIDENT REPORTING

BNL has several mechanisms in place for reporting incidents on site to ensure the timely identification, notification, and reporting of occurrences that could affect the health and safety of the public, employees, and the environment.

5.5.1 LABORATORY-WIDE INCIDENT REPORTING (INCLUDING ENVIRONMENTAL SPILLS)

The BNL telephone system is the primary mechanism for reporting BMP and other incidents. All employees receive training on how to report an incident (leak, spill, fire, etc.) to the Laboratory Protection Division's on-site emergency numbers, 911 or x2222. Laboratory Fire/Rescue personnel respond immediately to the incident and additional responders are then contacted, if needed, via Laboratory-provided cell phones, both during routine and off hours.

The Fire Rescue Incident Commander (IC) or designated alternate IC will proceed immediately to the reported incident to evaluate conditions and to notify and coordinate the efforts of the Fire Rescue, Safety and Health Services, Industrial Hygiene, the on-call Environmental Spill Responder, and F&O Grounds/Roads Groups. Once the incident is made safe by Fire Rescue/Operational personnel, then remediation can be planned, and subsequent cleanup may begin as per relevant Facility Response Plan protocols. An evaluation of regulatory notification applicability is conducted by the Spill Management Team member who is the on-call individual and for Operational Emergencies. This person is situated within the Consequence Assessment Unit of the EOC. The designated Remediation Project IC along with members of the EPD including WM will be assigned by the primary IC and will implement post-spill remedial action, as necessary. BNL has an SBMS Subject Area “Spill Response” that details specific procedures to follow for spill clean-ups.

5.5.2 REGULATORY AGENCY NOTIFICATION TRIGGERS

The Procedure for Oil/Chemical Spills Emergency Response at BNL is outlined in EPD SOPs (including the Environmental Compliance Group's role when responding to oil/chemical releases). When implemented, this procedure ensures that all necessary information is obtained and relayed to the appropriate regulatory agencies during reportable incidents. The following regulatory agencies are notified in the event of a release incident, as the following conditions dictate:

- **Oil Release**: Discharges in harmful quantities to navigable waterways of the State per 6 NYCRR Part 613 and 40 CFR 110 must be reported (definitions of harmful quantities and navigable waterways is all encompassing; consequently, all oil spills to the environment are reported). BNL's requirement is to report within two hours of any quantity of an oil spill to the environment to NYSDEC and SCDHS. Additionally, oil spills to a “Navigable waterway,” as defined above, must be reported to the National Response Center (NRC). The phone numbers are listed below:
  - NYSDEC Spill Hotline (1-800-457-7362)
  - NRC (1-800-424-8802)
  - SCDHS (1-631-854-2502)

**5.5.3 BNL'S OCCURRENCE REPORTING AND PROCESSING SYSTEM (ORPS)**

As discussed in BNLs ORPS Subject Area, *Occurrence Reporting and Processing System*, all staff must appropriately report abnormal events or conditions as per ORPS requirements to the ORPS Categorizer, including those they perceive may endanger the health and safety of staff or the public or have an adverse effect on the environment.

The ORPS database is used for identifying, categorizing, notifying, investigating, analyzing, and reporting DOE events or conditions, including leaks, spills, run-off, and other discharges which could affect storm water quality. The ORPS database is used for logging the following:

- **Event Discovery**: Report event to the appropriate staff.
- **Immediate Event Response and Categorization**: Initiate mitigation efforts to establish a safe, controlled condition, contact the Event Categorizer, categorize the event, make required notifications, and initiate follow-up activities.
- **Occurrence Notifications**: Notify appropriate staff, complete and transmit forms, and make required internal notifications and ATS entry.
- **Occurrence Investigation and Reporting**: Conduct fact-finding; initiate additional investigations, if needed; perform a causal analysis; develop corrective actions; review and approve update or final report; and close actions in ATS.
- **Report Follow-up and Action Closeout**: Notify ORPS Office as corrective actions are completed; the ORPS Office closes actions in ATS and ORPS databases.

**5.6 SECURITY**

A function of BNL's Safeguards and Security Division is to prevent the malevolent release of hazardous materials including radiological, chemical, and infectious agents or other criminal acts that would endanger employees, the public, and the environment. Under this program, Property Protection Areas (PPAs) have been established to define boundaries and access controls for the protection of the Laboratory. The following measures are in place to protect the site:

- BNL’s Safeguards and Security Division personnel provide 24 hours per day/7 days per week security by trained and armed security staff.
- Access of persons and vehicles is controlled via inspection at entrance guardhouses by site security approval of identity documents (Laboratory-issued ID badges, passes, and vehicle stickers).
- Fencing is present around most of the Lab’s property to prevent unauthorized personnel from entering the site.
- The site is well lit after dark, and S&SD personnel patrol and conduct surveillances via fixed posts.
Except for several operational buildings (e.g. Chilled Water Plant, Central Steam Plant), buildings are locked and secured after normal working hours.

Camera surveillance is deployed in select areas.

The Site Shift Supervisor for the F&O Directorate is responsible for notifying personnel who own equipment that there is a problem with respect to leakage, malfunctioning, alarms, etc. for F&O and select programmatic equipment and facilities outside of normal business hours. Off-hours inspections by Site Shift or Central Steam Plant or Water/Sewage Treatment Plant Operators include bulk oil and chemical storage areas and any minor follow-up investigations reported by the Site Shift Supervisor.

The following structural provisions are designed to ensure adequate security for materials in storage and to minimize the potential for impacts to stormwater quality:

- Unloading facilities are either equipped with normally closed Post Indicating Valves (PIV’s) or have dead-ended sumps to prevent product from accidentally flowing out if the connection is severed.
- All tank drains are fitted with locked valves (Normally Closed) and are additionally capped, plugged, or fitted with blank flanges to prevent tampering.
- The Used Oil and oil product storage tanks in the Production Division (Building 423) and the waste containers within Waste Management’s secondarily contained, NYSDEC Part 373-permitted RCRA Hazardous Waste Storage Facility, are enclosed within locked buildings or locked chain link fences which are secured outside of normal business hours.

5.7 EMPLOYEE TRAINING

The Laboratory has established training requirements in accordance with regulatory requirements for work to be performed, hazards that may be encountered, areas that will be accessed, potential for risk, and general site requirements. Supervisors and managers are responsible for ensuring that their employees, contractors, facility users, and guests are qualified to safely perform their work.

BNL’s Training and Qualifications Office uses a training database known as Brookhaven Training Management System (BTMS) to assess, maintain, and monitor training and qualification records to ensure workers meet the requirements to perform their assigned tasks. Training courses are linked to Job Training Assessments (JTAs), which are tools used to manage required training for specific tasks.

At a minimum, General Employee Training (GET) is required for all BNL employees. Contractors must complete Contractor/Vendor Orientation Training (CVO) before starting work on site unless the contractor has a BNL escort. This training contains information on site security measures, Laboratory safety, emergency planning and response, and environmental protection. BNL also provides specific compliance training, some of which include:

- Work Planning and Control
- Hazard Identification
- Hazardous and Industrial/oil Waste Generator
- Spill Response
- Health, Safety, & Security Regulatory Enforcement
- F&O equipment usage

In addition to Laboratory required training, departments develop SOPs to provide specific information for the tasks to be performed. SOPs are updated when the need for procedural changes/improvements are identified as a result of field work activities, job planning, or inspection/assessment findings. EPD SOPs
include Environmental Monitoring SOPs, Waste Management SOPs, Regulatory Compliance SOPs, and Environmental Information SOPs.

Additionally, members of the Guest Services, Heavy Equipment and Motor Pool Shops, and the Environmental Protection Division have completed either Operator Class A, B and/or C training for Underground Storage Tanks as per NYSDEC requirements listed in 6 NYCRR Part 613. This training includes spill prevention, leak detection, overfill prevention, tank monitoring methods—requirements related to fuel dispensing and UST’s.

5.8 EROSION CONTROL AND STORMWATER RUNOFF CONTROLS

Construction projects involving the disturbance of significant amounts of soil or those involving excavation projects where bulk amounts of soil are stockpiled or building demolitions are evaluated for runoff minimization. Erosion control devices are utilized vis-a-vis hay bales and silt fencing, or for more permanent measures, rip-rap lined rain sedimentation basins. Construction projects whereby erosion can occur are evaluated as part of the Work Planning and Control Process (WPC). The WPC team includes members of the Modernization Project Office, Production Div., Operational Excellence and Support, EPD, Safety and Health Services, IH, and RCD Departments/Directorates. EPD has field staff that have NYSDEC Erosion Control certifications who are authorized to perform erosion control inspections and are available for project design reviews.

5.9 SCRAP METAL MANAGEMENT

The main consolidation area for scrap metal is the covered structure at Building 485. This facility prevents stormwater runoff since it is covered by a roof. Third party vendors routinely remove the scrap metal from this facility and transport it off site to a NYSDEC “c7” registered scrap metal vendor for recycling (see Section 4.5.3 for more details). There are multiple locations throughout the Laboratory where small (3-6 cubic yards) uncovered scrap metal containers are temporarily staged prior to either being directly transferred off site by a vendor or transferred on site to the Building 485 Facility. On-site transfers are performed by BNL employees in the Procurement and Property Management (PPM) or Grounds Department (Production Division) using a van or a Load Lugger vehicle and by using the Process Knowledge Form for Clean and Suspension Encumbered Metals (see Appendix D). While being temporarily staged, runoff from these open-top containers may cause iron oxide/rust contamination to occur. However, PPM personnel have been instructed to place these containers on asphalt surfaces and not on soil or grassy areas. Furthermore, these areas are not close to navigable waterways.

Additionally, items such as compressors from HVAC equipment that have been previously drained of free-flowing oils that may have residual oil present are placed into scrap metal containers with covers. These covers minimize any oily-water runoff from occurring. Several areas within the Laboratory generate this type of scrap metal, including Buildings 452 (Metal Fabrication Department), 902, and 422. There are also small-scale machine shops located in multiple buildings across the site. These machine shops generate small quantities of scrap metal that include metal turnings with a residual layer of cutting oil. However, the amount of these turnings is small and any stormwater runoff due to these turnings would be insignificant. Large quantities of cuttings are generated at Building 479 and are stored in covered metal bins within secondary containment (see 4.7.4, HW-4 Section for details). If there are any signs of oil being released from any of these scrap metal containers onto the soil, Fabrication Department (Production Division) personnel contact Fire Rescue on x2222 and a spill response would be initiated including cleaning up the spill.

Scrap metal containers (typically 10-40 cubic yard containers) owned by third party vendors that are involved in metal recycling, construction, and demolition projects are also staged throughout the site. Ar-
rangements for the staging of these containers are coordinated through PPM Staff. Vendors are instructed by Laboratory personnel to place these containers, when possible, on asphalt-macadam or concrete surfaces and not near any environmentally sensitive areas, including soil and grassy areas.
Intentionally Left Blank
<table>
<thead>
<tr>
<th>AGS</th>
<th>Alternating Gradient Synchrotron</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATS</td>
<td>Assessment Tracking System</td>
</tr>
<tr>
<td>BLIP</td>
<td>Brookhaven Linac Isotope Producer</td>
</tr>
<tr>
<td>BMP</td>
<td>Best Management Plan or SWPPP (see below)</td>
</tr>
<tr>
<td>BMPs</td>
<td>Best Management Practices</td>
</tr>
<tr>
<td>BMRR</td>
<td>Brookhaven Medical Research Reactor</td>
</tr>
<tr>
<td>BNL</td>
<td>Brookhaven National Laboratory</td>
</tr>
<tr>
<td>BSA</td>
<td>Brookhaven Science Associates</td>
</tr>
<tr>
<td>BTMS</td>
<td>Brookhaven Training Management System</td>
</tr>
<tr>
<td>CAD</td>
<td>Collider Accelerator Department</td>
</tr>
<tr>
<td>CFN</td>
<td>Center for Functional Nanomaterials</td>
</tr>
<tr>
<td>CMMS</td>
<td>Computerized Maintenance Management System</td>
</tr>
<tr>
<td>CSF</td>
<td>Central Steam Facility</td>
</tr>
<tr>
<td>CVO</td>
<td>contractor vendor orientation</td>
</tr>
<tr>
<td>CWA</td>
<td>Clean Water Act</td>
</tr>
<tr>
<td>DOE</td>
<td>Department of Energy</td>
</tr>
<tr>
<td>E&amp;U</td>
<td>Energy and Utilities</td>
</tr>
<tr>
<td>ECR</td>
<td>Environmental Compliance Representative</td>
</tr>
<tr>
<td>EIMS</td>
<td>Environmental Information Management System</td>
</tr>
<tr>
<td>EMS</td>
<td>Environmental Management System</td>
</tr>
<tr>
<td>EPD</td>
<td>Environmental Protection Division</td>
</tr>
<tr>
<td>EPA</td>
<td>Environmental Protection Agency</td>
</tr>
<tr>
<td>ESH</td>
<td>Environment, Safety and Health</td>
</tr>
<tr>
<td>ESSH</td>
<td>Environmental, Safety, Security, and Health</td>
</tr>
<tr>
<td>F&amp;O</td>
<td>Facilities and Operations</td>
</tr>
<tr>
<td>FHWMF</td>
<td>Former Hazardous Waste Management Facility</td>
</tr>
<tr>
<td>FOC</td>
<td>Facility Operations Center</td>
</tr>
<tr>
<td>FPM</td>
<td>Facility Project Manager</td>
</tr>
<tr>
<td>FRP</td>
<td>Facility Response Plan</td>
</tr>
<tr>
<td>GET</td>
<td>general employee training</td>
</tr>
<tr>
<td>GFCI</td>
<td>ground-fault circuit interrupter</td>
</tr>
<tr>
<td>HEMO</td>
<td>heavy equipment mechanic operator</td>
</tr>
<tr>
<td>HITL</td>
<td>Heavy Ion Transfer Line</td>
</tr>
<tr>
<td>HVAC</td>
<td>heating/ventilation/air conditioning</td>
</tr>
<tr>
<td>IC</td>
<td>incident commander</td>
</tr>
<tr>
<td>ICS</td>
<td>Incident Command System</td>
</tr>
<tr>
<td>ISB</td>
<td>Interdisciplinary Science Building</td>
</tr>
<tr>
<td>ISMS</td>
<td>Integrated Safety Management System</td>
</tr>
<tr>
<td>ISO</td>
<td>International Organization for Standardization</td>
</tr>
<tr>
<td>JTA</td>
<td>job training assessment</td>
</tr>
</tbody>
</table>
LEED  Leadership in Energy and Environmental Design  
LINAC  Linear Accelerator  
LP  Laboratory Protection  
MOSF  Major Oil Storage Facility  
MPF  Major Petroleum Facility  
NRC  National Response Center  
NSLS  National Synchrotron Light Source  
NSLS-II  National Synchrotron Light Source-II  
NSRL  NASA Space Radiation Laboratory  
NYSDEC  New York State Department of Environmental Conservation  
OEM  Office of Emergency Management  
ORPS  Occurrence Reporting System  
OSHA  Occupational Safety and Health Administration  
OWS  oil-water separator  
P2  Pollution Prevention  
PM  preventative maintenance  
PPA  property protection areas  
PPM  Procurement and Property Management  
RCD  Radiological Control Division  
RCRA  Resource Conservation Recovery Act  
RHIC  Relativistic Heavy Ion Collider  
RTF  Radiation Therapy Facility  
SBMS  Standards Based Management System  
SCDHS  Suffolk County Department of Health Services  
SER  Site Environmental Report  
SHSD  Safety and Health Services Division  
SME  subject matter expert  
SMT  Spill Management Team  
SOP  Standard Operating Procedure  
SPCC  Spill Prevention Control and Countermeasure  
SPDES  State Pollutant Discharge Elimination System  
SRP  Site Staff and Services Garage  
STEM  Scanning Transmission Electron Microscope  
STP  Sewage Treatment Plant  
SWPPP  Stormwater Pollution Prevention Plan or “Best Management Plan”  
VOC  volatile organic compound  
VRM  vehicle radiation monitor  
WMF  Waste Management Facility  
WTP  Water Treatment Plant  
WWTP  Wastewater Treatment Plant
APPENDIX B - Risk Area Maps
APPENDIX C - Checklist for Inspection of Other Outdoor Storage/Work Areas
Quarterly Checklist for Inspection of Other Outdoor Storage/Work Areas

Location:_____________________________________      Date of Inspection:_____________________________

Department:__________________________________                                             Inspected by:_________________________________

Other Outdoor Storage/Work Areas must be inspected at least quarterly for evidence of excessive corrosion, or work by-products. Areas are expected to be clean at all times. The primary goal of performing this inspection is to mitigate contamination from site run off from raw material storage areas and other outdoor Laboratory operations. For each “NO” response a corrective action should be provided, or explanation noted in the “Comments” section stating why a corrective action is not warranted. Inspection reports should be maintained by the responsible department and presented to representatives of the Environmental Protection Division (EPD) and/or local regulatory agencies upon request.

<table>
<thead>
<tr>
<th>Observations</th>
<th>YES</th>
<th>NO</th>
<th>NA</th>
<th>Comments/Corrective Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Excess Material/Scrap/Shielding Storage Areas</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Is the area posted with the responsible operator/owner?</td>
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<tr>
<td>Are all materials protected from contact with precipitation?</td>
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<tr>
<td>Are enclosures in good repair and sufficient to prevent contact</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>with precipitation?</td>
<td></td>
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<tr>
<td>Are all materials visually clean with no evidences of significant</td>
<td></td>
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<td></td>
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<tr>
<td>surface corrosion and flaking?</td>
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<tr>
<td>Is area routinely maintained to permit access and visual</td>
<td></td>
<td></td>
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<tr>
<td>inspections from all sides?</td>
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<tr>
<td>Is the storage area routinely maintained to remove debris and other</td>
<td></td>
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<tr>
<td>materials, which may otherwise wash into the storm water</td>
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<tr>
<td>collection system?</td>
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<tr>
<td><strong>Outdoor Work or Material Handling Areas</strong></td>
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<tr>
<td>Are all areas free of debris (e.g., excessive leaf litter, trash)?</td>
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<tr>
<td>Are storm water catch basins unobstructed, allowing free flow of</td>
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<tr>
<td>stormwater runoff?</td>
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<tr>
<td>Are work areas routinely cleaned to remove all manufacturing</td>
<td></td>
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<tr>
<td>residuals (e.g., cuttings, scrap)?</td>
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<tr>
<td>Are all clean-up residues (e.g., speedy-dri) removed and</td>
<td></td>
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<tr>
<td>containerized to prevent contamination of run off?</td>
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<tr>
<td><strong>General Building Grounds</strong></td>
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<tr>
<td>Are grounds neat and free of debris that can cause surface</td>
<td></td>
<td></td>
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<tr>
<td>runoff?</td>
<td></td>
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<tr>
<td>Are there indications that AC and/or oil-filled transformers are</td>
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<td></td>
</tr>
<tr>
<td>leaking?</td>
<td></td>
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<tr>
<td>Are there indications that equipment (e.g., forklifts and cranes) is</td>
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<tr>
<td>leaking hydraulic fluid or oils and are they parked on pavement or</td>
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<tr>
<td>an impermeable surface?</td>
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<tr>
<td>Are all waste containers closed to prevent runoff and is the area</td>
<td></td>
<td></td>
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<tr>
<td>free of debris?</td>
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<tr>
<td>Are areas around waste containers dry with no evidence of</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>leakage?</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Are waste containers maintained within capacity and not filled to</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>excess?</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Are containers labeled and staged on impervious surfaces?</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

NA:  Not Applicable

**NOTE:**
Large outdoor, unprotected storage areas that cannot be protected economically should be periodically monitored (e.g., sampled) to ensure no environmental impacts are occurring from weathering or oxidation of materials in storage, which may become entrained in run off. Please contact your Environmental Compliance Representative to assist in developing/coordinating the monitoring activities.
APPENDIX D -
Process Knowledge Form for Clean and Moratorium/Suspect Metals
PROCESS KNOWLEDGE FORM

FOR CLEAN AND MORATORIUM/SUSPECT METALS

Part I: Clean Scrap Metal Section
Part II: Moratorium/Suspect Metal Waste Form Section

NOTE: This form should not be confused with/substituted for the BNL Hazardous Waste Process Knowledge Certification Form. This form only pertains to metallic items. Additionally, this form is NOT to be used for radioactive waste (see Radioactive Waste SBMS Subject Area).

Description of item(s):

Part I

CLEAN SCRAP METAL

1. □ YES □ NO Was this material designated as scrap while located within a Radiological Area (i.e. RADIATION/HIGH RADIATION/VERY HIGH RADIATION, CONTAMINATION/HIGH CONTAMINATION, or AIRBORNE RADIOACTIVITY AREA)?

   If YES, go to Part II. If NO continue. Contact an RCD Facility Support Representative if there are questions.

2. □ YES □ NO Does item(s) contain hazardous materials/substances (e.g. fluorescent bulbs containing mercury, mercury liquids, asbestos containing material, synthetic/petroleum oils, Freons/Ozone Depleting Substances, Polychlorinated Biphenyls, hazardous batteries, etc.)?

   If NO, sign the certification below and handle as clean scrap metal. If question #2 is YES, contact the WMR/ECR/WM Rep. for removal information before continuing. After removal, sign the certification below and handle as clean scrap metal.

Part II

MORATORIUM/SUSPECT METAL WASTE FORM (to be completed by RCD personnel).

1. Perform and record radiological survey of material.
2. If > Background dispose as moratorium metal waste in accordance with the Subject Area.
3. If < Background dispose as suspect metal waste in accordance with the Subject Area.
4. Identify material in the "general information" section of this form (to be completed by the Waste Generator).

Use the table below to record removable contamination survey (either disk smears or masslinn wipes) results. Enter scaler serial number and counter room number if using counter room equipment.

<table>
<thead>
<tr>
<th>Detector Type</th>
<th>Survey Instrument Serial No.</th>
<th>Counter Room No. or Instrument Model No.</th>
<th>Net Counts (cpm)</th>
<th>Reportable Result (dpm/100 cm²)</th>
<th>Comments (Radioanalytical Group Sample ID)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Use the table below to record fixed plus removable (direct) contamination survey results:

<table>
<thead>
<tr>
<th>Detector Type</th>
<th>Survey Instrument Serial No.</th>
<th>Counter Room No. or Instrument Model No.</th>
<th>Net Counts (cpm)</th>
<th>Reportable Result (dpm/100 cm²)</th>
<th>Comments (Radioanalytical Group Sample ID)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

Material is: □ Releasable □ Not Releasable

Surveyor's Signature ___________________________ Life Number _______ Date _______ Time _______

Reviewer's Signature ___________________________ Life Number _______ Date _______

NOTE: Mark "N/A" in unused spaces
PROCESS KNOWLEDGE FORM
FOR CLEAN AND MORATORIUM/SUSPECT METALS

General Information  PLEASE PRINT USING BLUE OR BLACK INK

Generator’s Name: ___________________________  Life/Guest #: ___________________________  Ext: ___________________________
Division/Department: ___________________________  Waste Origin: ___________________________  Account #: ___________________________

Waste Quantity (pounds) : ___________________________  or Total volume of waste (ft³): ___________________________

# of items: ___________________________  Detailed description of items: ___________________________

CERTIFICATION
Based upon my radiological and chemical process knowledge of the origin, storage, and use of the items(s) listed, I certify that all of the applicable information on this form is correct.

Print name of Requestor  Signature of Requestor  Life #  Date

All Moratorium/Suspect Metal must be transported to the Waste Management Facility and/or designated area and placed into a metals moratorium disposal container(s). Items must fit into waste container(s) – contact WM for size requirements. Moratorium/Suspect Metals will NOT be recycled.

NOTE: If any unacceptable item(s) is found within the metals moratorium disposal container, they will be removed and properly disposed of through Waste Management. Any associated costs will be billed back to the responsible department(s). If any spills occur due to oils or chemicals not being properly removed, then the associated cleanup and disposal costs will also be the responsibility of the owning department(s).