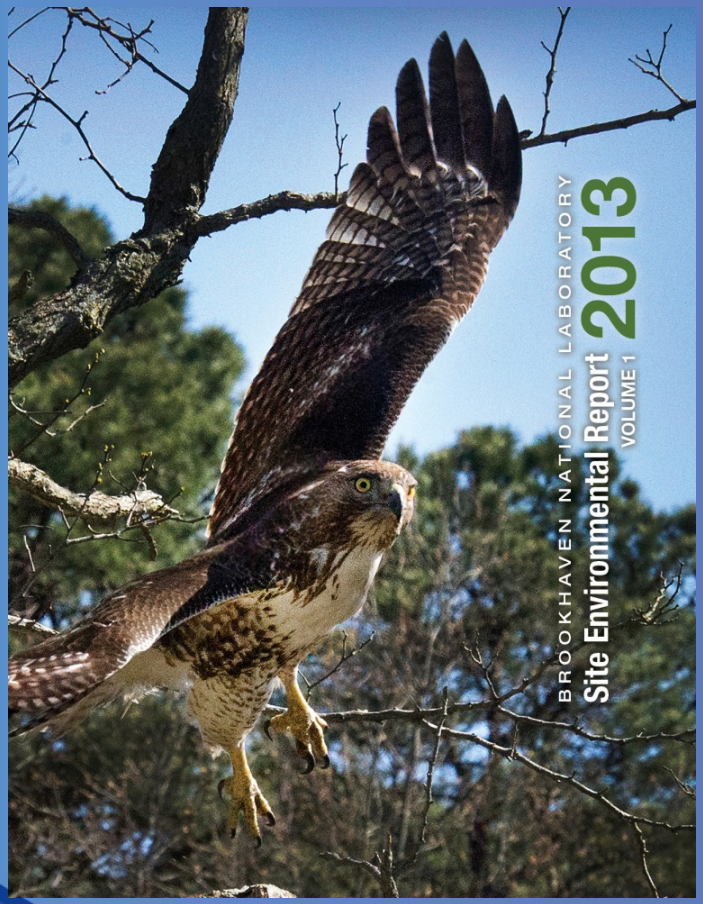
2013 Site Environmental Report



Brookhaven National Laboratory
Community Advisory Council Review
September 11, 2014

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Environmental Protection Division

BROOKHAVEN NATIONAL LABORATORY
a passion for discovery

Office of Science
U.S. DEPARTMENT OF ENERGY

Purpose of the Annual Site Environmental Report

- **Required by DOE and prepared in accordance with DOE Order 231.1B, Environment, Safety and Health Reporting. Documents compliance with:**
  - **DOE Order 436.1, Departmental Sustainability**

  – Requires DOE sites to maintain an Environmental Management System (EMS). An EMS specifies requirements for conducting general surveillance monitoring to evaluate the effects, if any, of site operations.
  - **DOE Order 458.1, Radiation Protection of the Public and Environment**

  – Requires DOE site to maintain surveillance monitoring for determining radiological impacts to the public and environment.
- **Official record of BNL's environmental impact for calendar year 2013**
  - Serves as an historical record; BNL has been preparing SERs since 1971
  - Used to respond to Freedom of Information Act (FOIA) requests
- **Serves as the principal environmental communications vehicle**
  - Distribution includes DOE, DOE Laboratories, regulators, local libraries, and interested stakeholders
  - Over 75 hardcopies and CD versions requested and distributed last year
- **Available as a downloadable file on the BNL web page, in hardcopy, and as a summary booklet that includes a CD version of the full report, including SER Volume II, Groundwater Status Report**

Keeping you informed…

- **We frequently bring topics of interest to the CAC's attention well before the SER is published**
- **SER Topic covered at CAC meetings in 2013 include:**
  - ✓ Environmental Assessment (EA) for the Management of the White-tailed Deer Population at BNL
  - ✓ SPDES Permit Modification/STP Upgrades Updates
  - ✓ Natural Resource Management Update
  - ✓ Peconic River Monitoring
  - ✓ Groundwater Treatment System Modifications

2013 SER
Table of Contents/Chapter Authors

	Authors
SER Volume I	
Executive Summary	Karen Ratel
Chapter 1 – Introduction	Karen Ratel
Chapter 2 – Environmental Management System	Peter Pohlot / Karen Ratel
Chapter 3 – Compliance Status	Jason Remien
Chapter 4 – Air Quality	Jeff Williams
Chapter 5 – Water Quality	Jason Remien
Chapter 6 – Natural and Cultural Resources	Tim Green
Chapter 7 – Groundwater Protection	Bill Dorsch / Douglas Paquette
Chapter 8 – Radiological Dose Assessment	Tim Welty
Chapter 9 – Quality Assurance	John Burke

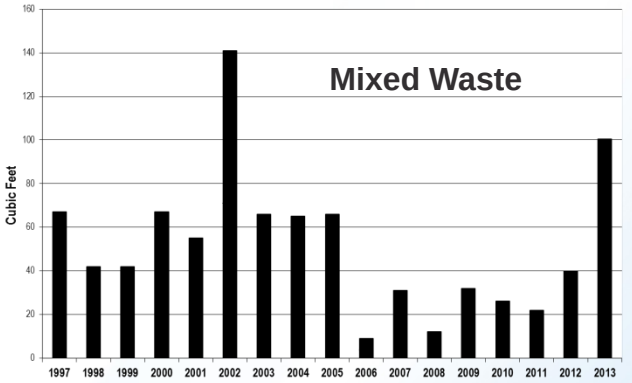
- **SER Volume II**
  - Groundwater Status Report – Groundwater Protection Group (approved by DOE and regulators in August 2014)

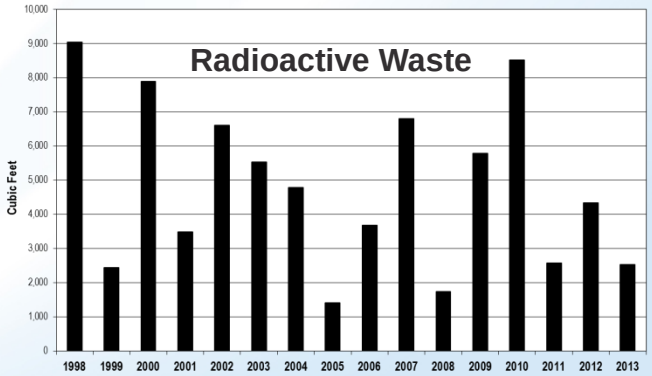
Chapter 2 - Environmental Management System (EMS) ISO 14001

- **EMS Recommended for continued certification by NSF, June 2013**
  - "The system is fully integrated and effective with one minor nonconformity and many system strengths."
  - **1 Minor Nonconformance:** Environmental Policy is not consistently communicated to contractors.
    - Handouts and verbally presented content provided in the 5/13/13 contractor vendor orientation (provided daily, as needed for contractors) did not include the ESSH policy statement

Chapter 2 – Waste Generation

- **As a result of research and cleanup activities, BNL generated regulated waste requiring careful handling and disposal.**
- **In 2013, BNL generated the following types and quantities of waste (trend noted):**
  - **Routine Operations**
    - Hazardous Waste: 3.1 tons - down
    - Mixed Waste: 100 ft^3 - up
    - Radioactive Waste: 2,526 ft^3 – down
  - **Nonroutine Operations (ER and BNL)**
    - Hazardous Waste: 390 tons - up
    - Mixed Waste: 81 ft^3 - steady
    - Radioactive Waste: 1,490 ft^3 - down





Chapter 2 – Pollution Prevention (P2) Program

- **Cost avoidance of over $12.7 million in FY 2013**
  - Reduced/recycled/reused 13.4 million lbs. of industrial, sanitary, hazardous, and rad waste
- **Funds invested in FY 2013 = $6,000**
  - 7 proposals submitted, 3 proposals funded
  - Annual cost savings ~ $17,500 from new projects
  - Average payback ~ 4 months

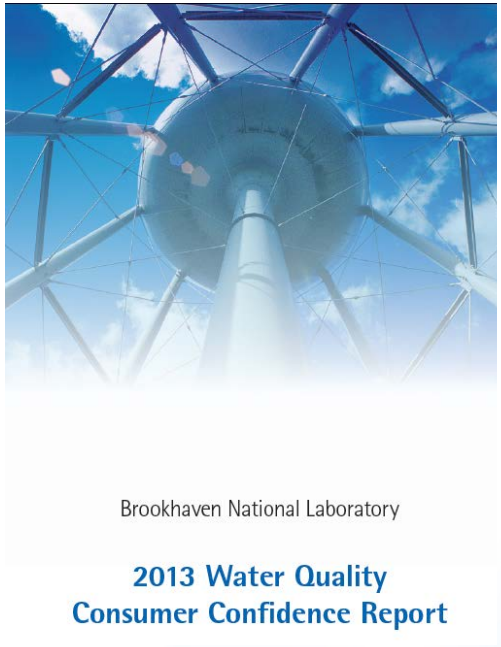
Chapter 2 – Site Sustainability Plan (SSP)

- **2013 Statistics**
  - 271 million kilowatt hours of electricity
  - 128,000 gallons of fuel oil
  - 16,000 gallons of propane
  - 619 million ft^3 feet of natural gas
  - Energy use per square foot was ~ 8.8% less than in 2003 (SSP goal is 30% by FY 2015)

- **EO 13514/DOE O 436.1**
  - Establishes aggressive sustainability goals
  - Requires preparation of a Site Sustainability Plan to target actions to meet the goals
  - Summary of goals and status of BNL's SSP provided in Chapter 2

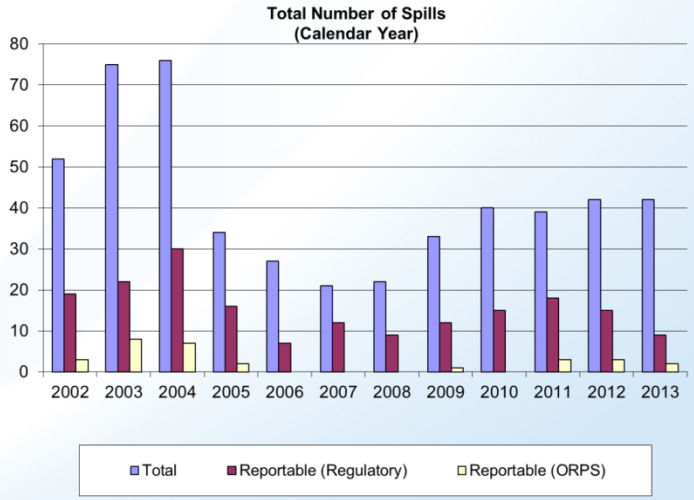
Chapter 3 – Compliance Status Overview

- **National Environmental Policy Act (NEPA) - 100 additional projects reviewed for NEPA**
  - 94 considered minor actions
  - 6 Environmental Evaluation Notification Forms; all categorically excluded or fell within scope of existing EA
  - One project, Management of the White-tailed Deer Population at BNL, was completed with a Finding of No Significant Impact (FONSI)



- **Potable Water**
  - Usage similar to 2012
  - Complied with all drinking water requirements

- **42 spills in 2013**
  - 9 spills reportable to NYSDEC
  - Most spills were small-volume releases either to containment areas or to other impermeable surfaces that did not exceed a reportable quantity



Chapter 3 – Inspections and Assessments

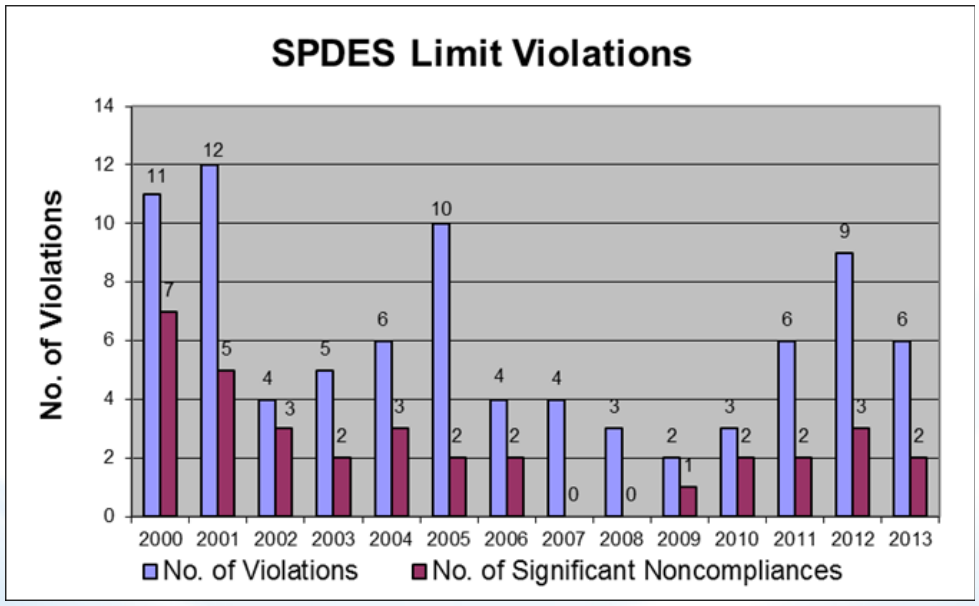
- **External Inspections**
  - **EPA (RCRA & NPDES):** No issues identified
  - **NYSDEC**
    - Major Petroleum Facility/Chemical Bulk Storage: 5 minor findings; all addressed
    - Air: No issues identified during a September 2013 inspection
    - SPDES: No issues identified during annual surveillance inspection
    - RCRA: No issues identified
  - **SCDHS (STP, public water):** No issues identified at STP, potable water deficiencies identified are being addressed by F&O

Chapter 3 – Inspections and Assessments (continued)

- **Internal Assessments (DOE-BHSO)**
  - **Follow-up Surveillance of BNL's Response to the Building 705 Stack Drain Tank High-Level Alarm**
    - BHSO verified that BNL has successfully implemented numerous corrective actions to prevent recurrence of the overflow of the HFBR stack drain tank and lack of timely alarm response
  - **BHSO-CH: Participated in Peer Assessment of BNL's Radionuclide-National Emission Standards for Hazardous Air Pollutants (Rad-NESHAP's) Program**
    - The NESHAP's assessment yielded no non-conformances, 5 programmatic strengths, and 19 OFIs
    - In May 2013, a team of BNL Subject Matter Experts (SMEs) were assembled to analyze the OFIs and identify actions needed to improve Rad-NESHAP program implementation; A final report was completed in June, and most of the corrections were completed by September 30, 2013

Chapter 3 and 5 – Water Quality Monitoring

- State Pollutant Discharge Elimination System (SPDES) – 6 permit excursions
  - (2) ammonia, (2) total nitrogen, and (1) total nitrogen load at STP
  - (1) for Tolytriazole at Outfall 002 (HN)
- Metals detected in surface water samples consistent with SPDES limits
- No VOCs detected above contract laboratory's MDLs (STP and Peconic River)
- Tritium detected (530 ± 370 pCi/L) in a single water sample collected at HY, an area upstream of the STP discharge
- No Cs-137, Sr-90, or other gamma-emitting nuclides attributable to Laboratory operations were detected



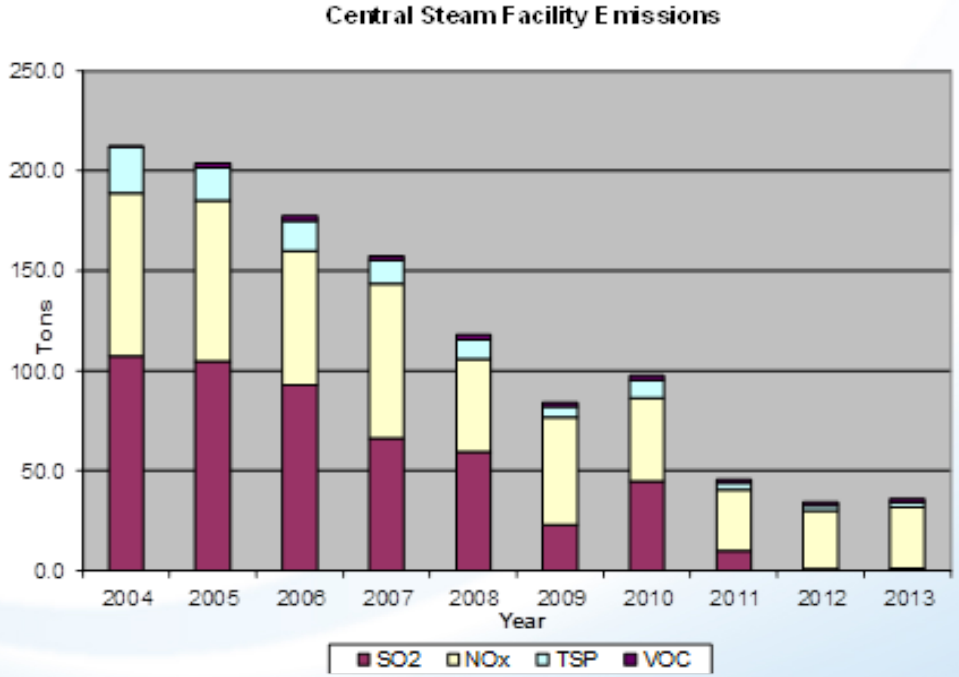
Chapter 4 – Air Quality (Radiological)

- **Radiological Monitoring**
  - Brookhaven Linear Isotope Producer, Building 801 Target Processing Lab, HFBR
    - Total radionuclides released: 4,919 Ci (4,901 Ci in 2012)
    - BLIP emissions of short-lived radioactive gases (O-15 and C-11) accounted for 99.99% of total.

- **Ambient Air Monitoring**
  - Radiological air quality monitored at four on-site locations around the perimeter of the site:
    - Gross alpha and beta concentrations consistent with natural background
    - Average tritium concentration less than MDAs

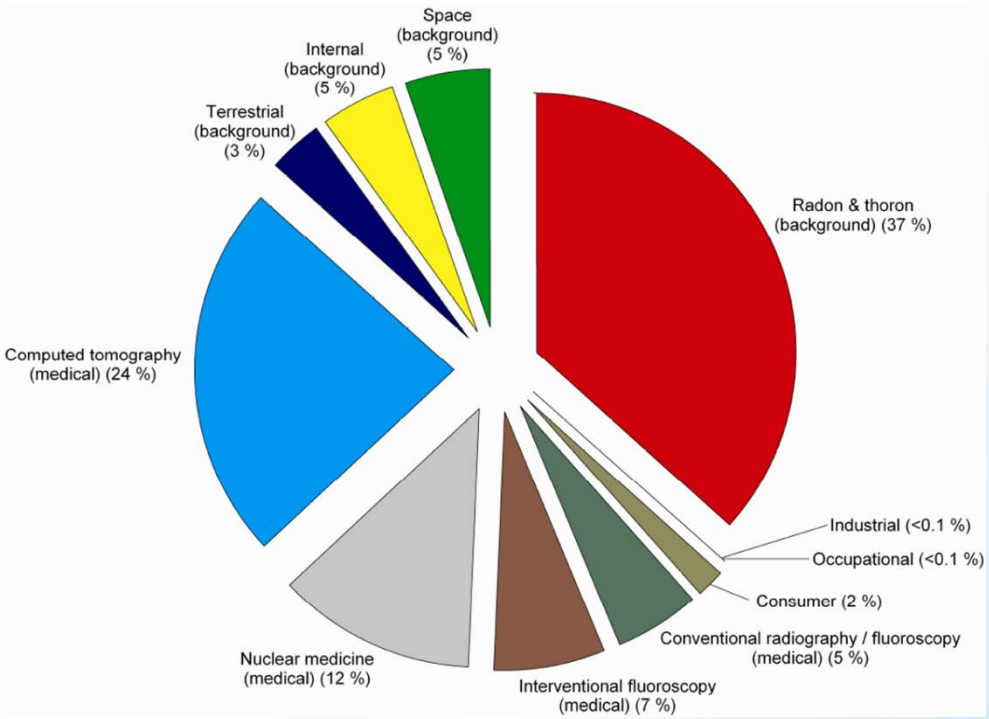
Chapter 4 – Air Quality (Non-Radiological)

- **Continuous emissions monitoring required for Central Steam Facility Boiler Nos. 6 & 7**
  - No measured exceedances of NO_x limits
  - One 6-min period opacity exceedance (Boiler 6 on August 5)
  - Fuel oil use was 117,214 gallons; 43,438 gallons 2012
  - SO_2 , NO_x, TSP, and VOC emissions well under respective permit limits of 445, 159, 113.3, and 39.7 tons.



Chapter 8 - Radiological Dose Assessment

- **Ambient external dose (TLDs)**
  - 66 mrem on site and 61 mrem off site (includes cosmic and terrestrial background)
  - no external dose contribution from BNL operations
- **Total effective dose to the Maximally Exposed Off-site Individual (MEOSI) in 2013 from inhalation and ingestion pathways was 2.55 mrem**
- **Well Below Regulatory Limits**
  - EPA: 10 mrem (air pathway)
  - NYSDOH: 10 mrem (ingestion pathway)
  - DOE: 100 mrem (from all pathways)



Average dose to individual is **620 mrem/year**

From NCRP Report No. 160, “Non-Occupational Ionizing Radiation Exposure of the Population of the United States” (2009)

Future Presentations

- Chapter 6: Natural and Cultural Resources (October)

- Chapter 7: Groundwater Protection (November)

QUESTIONS?