2006 Site Environmental Report

BROOKHAVEN NATIONAL LABORATORY

SUMMARY

Green frog (Rana clamitans melanota)

ABOUT THE COVER

The photo on the front cover of the green frog was taken by a student intern working under Dr. Tim Green, BNL's Natural and Cultural Resource Manager. The green frog, wood frog, spring peeper, gray treefrog, and the bullfrog are common species found at BNL and throughout the Long Island region. The fowler's toad is also commonly found in the area, although numbers have declined in recent years. The pickerel frog, though not as common in all regions of Long Island, is also found at the Laboratory and looks similar to the southern leopard frog.

The southern leopard frog was once regarded as one of the most abundant frog species on Long Island, but has suffered drastic declines over the past 30 to 50 years. They now appear to be extremely rare in this region, if not entirely extinct. Their disappearance has occurred across a variety of landscapes ranging from areas of heavy development to pristine and well-protected natural areas. Many amphibian declines throughout the world today are being linked to global change (e.g. increasing disease outbreaks, invasive species, and contamination).

Southern leopard frog (Rana spehnocephala)

While working for the U.S. Fish & Wildlife Services, Jeremy Feinberg gathered three years of baseline information on the southern leopard frog at the Laboratory. He used the information to develop a PhD project at Rutgers University that will test and evaluate the potential negative impacts of four possible negative threats associated with global change and environmental perturbation–disease, contaminants, invasive vegetation, and increased interspecific competition from human subsidized competitors (two closely related frog species). Data will be collected by raising southern leopard frog tadpoles within historic wetland sites on Long Island where the species occurred in the past (including sites at BNL). By using tadpoles as bioindictors within in situ wetland enclosures, he will monitor the development and survivorship of tadpoles and young frogs under various conditions and treatments in an effort to isolate specific causes and trends that may help explain this decline and aid in future amphibian biodiversity conservation.

Gray treefrog (Hyla versicolor)

Fowler's toad (Bufo fowleri)

Wood frog (Rana sylvatica)

Pickerel frog (Rana palustris)

Spring peeper (Pseudacris crucifer)

Bullfrog (Rana catesbeiana)

The Brookhaven National Laboratory 2006 Site Environmental Report is a public document that is distributed to various U.S. Department of Energy sites, local libraries, and local regulators and stakeholders. The report is available to the general public on the internet at http://www.bnl.gov/esd/ser.asp. A summary of the report is also available and is accompanied by a compact disk containing the full report. To obtain a copy of the summary and CD, please write or call:

Brookhaven National Laboratory
Environmental and Waste Management Services Division
Attention: SER Project Coordinator
Building 120
P.O. Box 5000
Upton, NY 11973-5000
(631) 344-3711

2006 Site Environmental Report SUMMARY

A MESSAGE FROM THE LABORATORY DIRECTOR

2006 was an exciting year for Brookhaven National Laboratory, and for me as well. In April, I was named Interim Director of the Laboratory, and was fortunate to witness many achievements throughout the year before being named Director that August following a nationwide search. In this new role, I believe the future for scientific research at the Lab looks very bright—with the newly constructed Center for Functional Nanomaterials, the planned National Synchrotron Light Source II project, and proposed enhancements to the Relativistic Heavy Ion Collider, we believe we will have the scientific tools to make some truly special advances in basic and applied science.

Our environmental performance in 2006 continued to be a success. We received three awards from the DOE Office of Science for Best in Class for expanding the envelope of our Environmental Management System through voluntary participation, designing a system to compost animal bedding, and for recycling and reusing waste concrete on site. In addition, BNL was honored with a National Partnership for Environmental Priorities Award for reducing both our mercury waste generation and our inventory of polychlorinated biphenyls. I am proud of these awards, because they show how successful we have been with our pollution prevention and recycling programs.

As we continue to move forward with our scientific enhancements, we also retain our commitment to the environment and our many communities. This book is an annual example of our efforts to remain a good and considerate neighbor whose operations are open and transparent.

Samuel Aronson
Laboratory Director

BROOKHAVEN
NATIONAL LABORATORY

EXPLORING EARTH'S MYSTERIES
...PROTECTING ITS FUTURE

Preface

Each year, Brookhaven National Laboratory (BNL) prepares an annual Site Environmental Report (SER) in accordance with the U.S. Department of Energy (DOE) Order 231.1A, Environment, Safety and Health Reporting. The SER is written to inform the public, regulators, Laboratory employees, and other stakeholders of BNL's environmental performance during the calendar year in review. The report summarizes BNL's environmental data; environmental management performance; compliance with applicable DOE, federal, state, and local regulations; and compliance, restoration, and surveillance monitoring performance. BNL has prepared annual SERs since 1971 and has documented nearly all of its environmental history since the Laboratory's inception in 1947.

The SER is intended to be a technical document and is available in print and as a downloadable file. This summary provides a general overview of the SER and includes the full report on CD, which can be found on the inside back cover of this booklet. The summary is intended for public distribution in support of BNL's educational and community outreach and as part of DOE's commitment to conveying environmental performance to people living near DOE facilities and to other interested stakeholders. Both the full report and the summary are available as downloadable files on the BNL web page at http://www.bnl.gov/ewms/SER.asp.

ESSH Policy

The Laboratory's Environmental, Safety, Security, and Health (ESSH) Policy makes clear BNL's commitments to environmental stewardship, the safety of its employees, and the security of the site. Specific environmental commitments in the policy include compliance, pollution prevention, cleanup, community outreach, and continual improvement.

The ESSH Policy is posted throughout the site, on the BNL website at http://www.bnl.gov/ESHQ/ESSH.asp, and is included in all training programs for new employees, guests, and contractors.

Environmental, Safety, Security, and Health Policy

Brookhaven National Laboratory

This document is a statement of BNL's ESSH policy. BNL is a world leader in scientific research and strives to demonstrate excellence in protecting people, property, and the environment.

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 our other stakeholders.
- Continual Improvement: We continually improve ESSH performance.

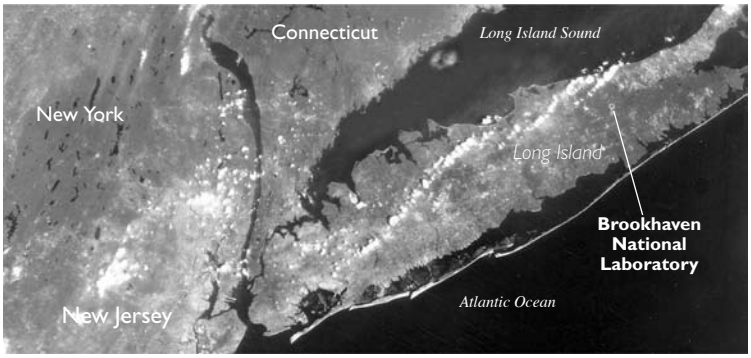
In addition to my annual review of BNL's progress on ESSH goals and adherence to this policy, I invite all interested parties to provide me with input on our performance relative to this policy, and the policy itself.

Samuel Aronson, Director — September 6, 2006

BROOKHAVEN NATIONAL LABORATORY

About Brookhaven National Laboratory

Brookhaven National Laboratory is one of ten national laboratories overseen and primarily funded by the Office of Science of the U.S. Department of Energy. The Laboratory conducts research in nuclear and high-energy physics, physics and chemistry of materials, environmental and energy research, nonproliferation, neurosciences and medical imaging, and structural biology. BNL also builds and operates major scientific facilities available to university, industry, and government researchers. Established in 1947, BNL is operated and managed by Brookhaven Science Associates (BSA). BSA, a non-profit, limited-liability company formed as a 50-50 partnership between Battelle Memorial Institute and The Research Foundation of State University of New York (SUNY) on behalf of SUNY-Stony Brook, the legal entity responsible for leading BNL successfully through the 21st century. Stony Brook University and Battelle have 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.



Satellite photo showing location of BNL. The small circle is the Relativistic Heavy Ion Collider, known as RHIC.

The Laboratory's broad mission is to produce world-class science and advanced technology in a safe and environmentally sound manner with the cooperation, support, and appropriate involvement of its scientific and local communities. BNL has a staff of approximately 2,700 scientists, engineers, technicians, and support staff. The fundamental elements of the Laboratory's role in support of DOE's strategic missions in energy resources, environmental quality, and national security are:

- To conceive, design, construct, and operate complex, leading-edge, user-oriented research facilities in response to the needs of DOE and the international community of users.
- To carry out basic and applied research in long-term, high-risk programs at the frontier of science.
- To develop advanced technologies that address national needs and to transfer them to other organizations and to the commercial sector.
- To disseminate technical knowledge to educate future generations of scientists and engineers, to maintain technical capabilities in the nation's workforce, and to encourage scientific awareness in the general public.

BNL is located on Long Island, 60 miles east of New York City. The Laboratory's 5,265-acre site is near Long Island's geographic center and is part of the Town of Brookhaven, the largest township (both in area and population) in Suffolk County. The Laboratory annually hosts an estimated 3,500 visiting scientists, more than 30 percent of whom are from New York State universities and businesses. The visiting scientists and their families, as well as students, reside in apartments and dormitories on site or in the surrounding communities. More than 75 percent of BNL employees live in Suffolk County.

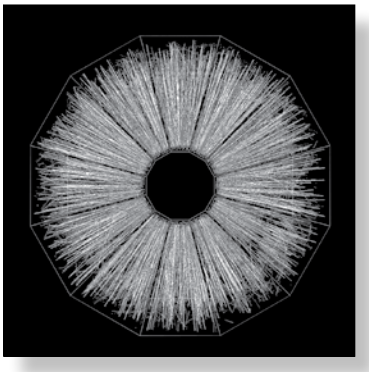
The Laboratory is one of five large, high-technology employers on Long Island. An independent Suffolk County Planning Commission concluded that BNL's spending for operations, procurement, payroll, construction, medical benefits, and technology transfer spreads throughout Long Island's economy, making BNL vital to the local economic health. Several of the Laboratory's currently planned projects, which include the Center for Functional Nanomaterials and the proposed building of a new synchrotron light source (NSLS-II), are expected to significantly enhance BNL's economic value to Long Island and New York State.

In 2006, BNL's total annual budget was approximately $490 million, of which approximately 57 percent was spent on employees' salaries, wages, and fringe benefits. In addition, the Laboratory purchased $36.5 million worth of supplies and services from Long Island businesses. Out of that amount, approximately $14.7 million was spent on approximately 3,000 purchases in Suffolk County and approximately $4.3 million went toward 507 purchases made in Nassau County.

Research and Discoveries at BNL

BNL is home to many world-class research facilities and scientific departments which attract resident and visiting scientists from all over the world in many fields. To date, research at the Laboratory has produced six Nobel Prizes http://www.bnl.gov/bnlweb/history/nobel/. Listed below are some examples of current research and discoveries at BNL. Further information can be found at http://www.bnl.gov/bnlweb/research_list.asp.

a.



b.

c.

a. End view of a collision of two 30-billion electron-volt gold beams in the STAR detector at RHIC. The beams travel in opposite directions at nearly the speed off light before colliding.

b. The Positron Emission Tomography (PET) facility is used to conduct brain research, including how drugs, mental illness, nicotine, alcohol, and normal aging affect the brain.

c. The goal at the Center for Functional Nanomaterials (CFN) is to help solve energy problems in the U.S. by exploring materials that use energy efficiently and by researching practical alternatives to fossil fuels.

Examples of Current Research

- Investigation of new nanostructures, objects on the scale of a billionth of a meter
- High-temperature superconductors—materials that, below a certain temperature, conduct electricity with no resistance
- New states of matter being produced at the Relativistic Heavy Ion Collider
- Nanoparticles which may lead to catalytic converters that are better at cleaning up auto exhaust
- Medical imaging techniques to investigate the brain mechanisms underlying drug addiction
- New methods of understanding the earth's climate
- Research into how infections begin, which may lead to better prevention

BNL Discoveries

- L-dopa, used to treat Parkinson's disease
- Pioneering work using x-rays and neutrons to study biological specimens, leading to the modern science of structural biology
- The radionuclide thallium-201, used in hundreds of thousands of heart stress-tests each year
- The radionuclide technetium-99m, used to diagnose heart disease and other ailments in over 11 million Americans each year
- X-ray angiography for non-invasive heart imaging
- Pioneering solar neutrino studies seeking the answer to the mystery of the "missing" neutrinos from our solar system's sun, and neutrino bursts from supernovae

Aerial photograph of the BNL site.

BNL Facilities and Operations

The Laboratory's 5,265 acres are mostly wooded and part of the native Long Island Pine Barrens ecosystem. Most of BNL's principal facilities are located near the center of the site. The developed area is approximately 1,650 acres:

- 500 acres originally developed by the U.S. Army (as part of Camp Upton) and still used for offices and other operational buildings
- 550 acres used for outlying facilities, such as the Sewage Treatment Plant, agricultural research fields, housing facilities, and fire breaks
- 400 acres of roads, parking lots, and connecting areas
- 200 acres occupied by large, specialized research facilities

The major scientific facilities at BNL are briefly described on the following page. The three former research reactors (the Brookhaven Graphite Research Reactor, the High Flux Beam Reactor, and the Brookhaven Medical Research Reactor) are no longer operating. Other facilities, which are briefly described below, support BNL's science and technology mission by providing basic utility and environmental services. All of the research and support facilities must undergo periodic environmental review as part of BNL's Environmental Management Program.

- *Central Chilled Water Plant.* This plant 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.* This facility 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. Condensate is collected and returned to the facility for reuse, to conserve water and energy.
- *Fire Station.* The BNL Fire Rescue Group provides on-site fire suppression, emergency medical services, hazardous material response, salvage, and property protection. The fire rescue group responds within 5 minutes to any emergency in the core area of the Laboratory and within 8 minutes to emergencies in the outer areas (Relativistic Heavy Ion Collider and eastern portions of the site).
- *Major Petroleum Facility.* This facility provides reserve fuel for the Central Steam Facility during times of peak operation. With a total capacity of 2.3 million gallons, the facility stores primarily No. 6 fuel oil. The 1997 conversion of the facility's boilers to burn natural gas as well as oil has significantly reduced BNL's reliance on oil as a fuel source.
- *Research Support Building.* This building consolidates frequently visited administrative and support functions in a single locaton for BNL employees and visiting scientists. The 65,000-square-foot building tops New York State Requirements for energy effieciency by 15 percent. The structure is considered "green," or environmentally friendly, based on a rating system by the U.S. Green Building Council's Leadership in Energy & Environmental Design, also known as LEED.
- *Sewage Treatment Plant.* This facility treats sanitary and certain process wastewater from BNL facilities prior to discharge into the Peconic River, similar to the operations of a municipal sewage treatment plant. The plant has a design capacity of 3 million gallons per day. Effluent is monitored and controlled under a permit issued by the New York State Department of Environmental Conservation.
- *Waste Concentration Facility.* This facility was previously used for the receipt, processing, and volume reduction of aqueous radioactive waste. At present, the facility houses equipment and auxiliary systems required for the storage and transfer of liquid low-level radioactive waste.
- *Waste Management Facility.* This facility is a state-of-the-art complex for managing the wastes generated from BNL's research and operations activities. It was built with advanced environmental protection systems and features, and began operation in December 1997.
- *Water Treatment Plant*. The potable water treatment facility has a capacity of 5 million gallons per day. Potable water is obtained from six on-site wells. Three wells located along the western boundary of the site are treated with a lime softening process to remove naturally occurring iron. The plant is also equipped with dual air-stripping towers to ensure that volatile organic compounds are below New York State drinking water standards. Three wells located along the eastern section of the developed site are treated with carbon to ensure that volatile organic compound levels meet drinking water standards. BNL's water met all drinking water standards in 2006.

Major Scientific Facilities at BNL

- *AGS Booster.* The AGS Booster is a circular accelerator used for physics research and radiobiology studies. It receives either a proton beam from the Linac or heavy ions from the Tandem Van de Graaff and accelerates these before injecting them into the AGS ring for further acceleration. The Booster also serves as the energetic heavy ion source for the NASA Space Radiation Laboratory, which is used to simulate the harsh cosmic and solar radiation environment found in space.
- *Alternating Gradient Synchrotron (AGS).* The AGS is a particle accelerator used to propel protons and heavy ions to high energies for physics research. The AGS is capable of accelerating protons and heavy ions, such as gold and iron. The Linear Accelerator, part of the AGS complex, serves as a proton injector for the AGS Booster.
- *Brookhaven Graphite Research Reactor (BGRR).* The BGRR was the first peace-time reactor to be constructed in the United States following World War II. It was used for scientific exploration in the fields of medicine, biology, chemistry, physics, and nuclear engineering. The BGRR is currently being decommissioned.
- *Brookhaven Medical Research Reactor (BMRR).* The BMRR was the world's first nuclear reactor built exclusively for medical research and therapy. It produced neutrons in an optimal energy range for experimental treatment of a type of brain cancer known as glioblastoma multiforme. The BMRR was shut down in December 2000 due to a reduction in medical research funding.
- *Center for Functional Nanomaterials (CFN).* Although not yet operational, the CFN will provide state-of-the-art capabilities for the fabrication and study of nanoscale materials, with an emphasis on atomic-level tailoring to achieve desired properties and functions. The CFN is a science-based user facility, simultaneously developing strong scientific programs while offering broad access to its capabilities and collaboration through an active user program. The overarching scientific theme of the CFN is the development and understanding of nanoscale materials that address the Nation's challenges in energy security, consistent with the Department of Energy mission.
- *Heavy Ion Transfer Line (HITL).* The HITL connects the Tandem Van de Graaff and the AGS Booster. This interconnection enables the transport of ions of intermediate mass to the AGS Booster, where they are accelerated before injection into the AGS. Ions are then extracted and sent to the AGS experimental and RHIC areas for physics research.
- *Linear Accelerator (Linac) and Brookhaven Linac Isotope Producer (BLIP).* The Linac provides beams of polarized protons for the AGS and RHIC. The excess beam capacity is used to produce radioisotopes for research and medical imaging at the BLIP. The BLIP is one of the nation's key production facilities for radioisotopes, which are crucial to clinical nuclear medicine. The BLIP also supports research on new diagnostic and therapeutic radiopharmaceuticals.
- *National Synchrotron Light Source (NSLS).* The NSLS uses a linear accelerator and booster synchrotron as an injection system for two electron storage rings that provide intense light spanning the electromagnetic spectrum from the infrared through x-rays. The properties of this light and the 80 specially designed experimental stations, called beamlines, enable scientists to perform a large variety of experiments.
- *Relativistic Heavy Ion Collider (RHIC).* The RHIC is a world-class scientific research facility. The RHIC accelerator drives two intersecting beams of gold ions, other heavy metal ions, and protons head-on to form subatomic collisions. What physicists learn from these collisions help us understand more about why the physical world works the way it does, from the smallest subatomic particles, to the largest stars.
- *Scanning Transmission Electron Microscope (STEM).* The STEM facility includes two microscopes, STEM 1 and STEM 3, used for biological research. Both devices allow scientists to see the intricate details of living things, from bacteria to human tissue.
- *Tandem Van de Graaff and Cyclotron.* These accelerators are used in medium energy physics investigations and for producing special nuclides. The Tandem Van de Graaff accelerators are used to bombard materials with ions for manufacturing and testing purposes, and supply the RHIC with heavy ions. The cyclotrons, operated by the Chemistry Department, are used for the production of radiotracers for use in Positron Emission Tomography (PET) and Magnetic Resonance Imaging (MRI) studies.

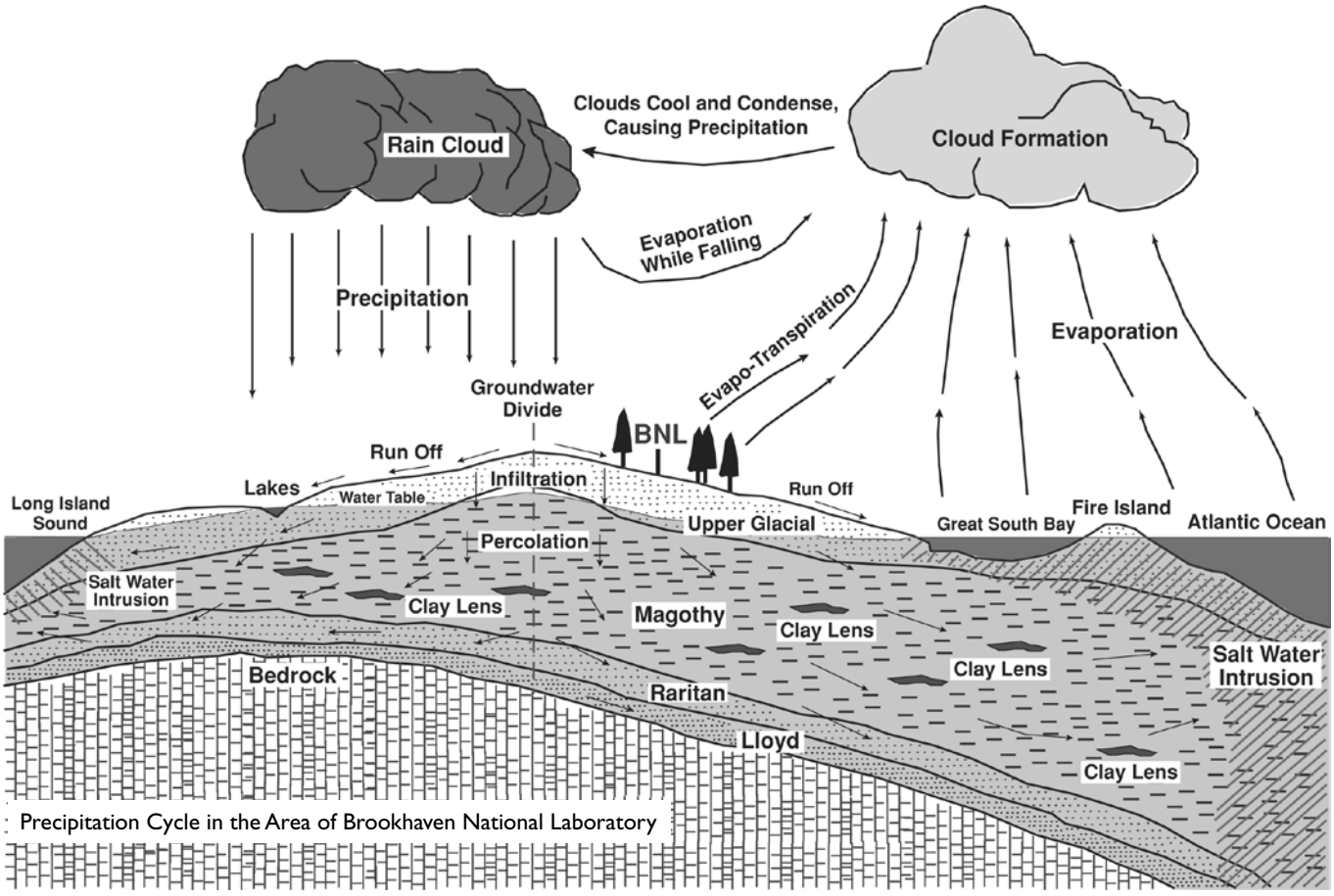
Hydrology and Geology of the BNL Site

BNL 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. The Peconic River both recharges to, and receives water from, the sole source aquifer system beneath Long Island. Long Island's aquifer system is one of 72 sole source aquifers in the nation recognized under the aquifer protection program authorized by the U.S. Safe Drinking Water Act.

The terrain of the BNL site is gently rolling, with elevations varying between 44 and 120 feet above mean sea level. Depth to groundwater from the land surface ranges from 5 feet near the Peconic River to about 80 feet in the higher elevations of the central and western portions of the site. The hydrology and geology of the local area are well defined. Studies in the vicinity of the Laboratory indicate that the uppermost Pleistocene deposits, composed of highly permeable glacial sands and gravel, are between 120 and 250 feet thick. Water penetrates these deposits readily and there is little direct runoff into surface streams unless precipitation is intense. These sandy deposits store large quantities of water in the Upper Glacial aquifer. On average, about half of the annual precipitation is lost to the atmosphere through evapotranspiration and the other half percolates through the soil to recharge the groundwater.

The BNL site is positioned within a deep-flow recharge zone for Long Island groundwater. Precipitation and surface water that recharge within this zone have the potential to replenish the deep Magothy and Lloyd aquifer systems lying below the Upper Glacial aquifer. It is estimated that up to 40 percent 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 through the use of an extensive network of shallow and deep wells installed at BNL and surrounding areas. This groundwater system is the primary source of drinking water for both on- and off-site private and public supply wells.

During 2006, BNL used approximately 1.3 million gallons of groundwater per day to meet potable water needs and heating and cooling requirements. Approximately 75 percent of the water pumped from Laboratory supply wells is returned to the aquifer through on-site recharge basins and permitted discharges to the Peconic River. Under normal hydrologic conditions, most of the water discharged to the river recharges to the Upper Glacial aquifer before leaving the site. Human consumption,

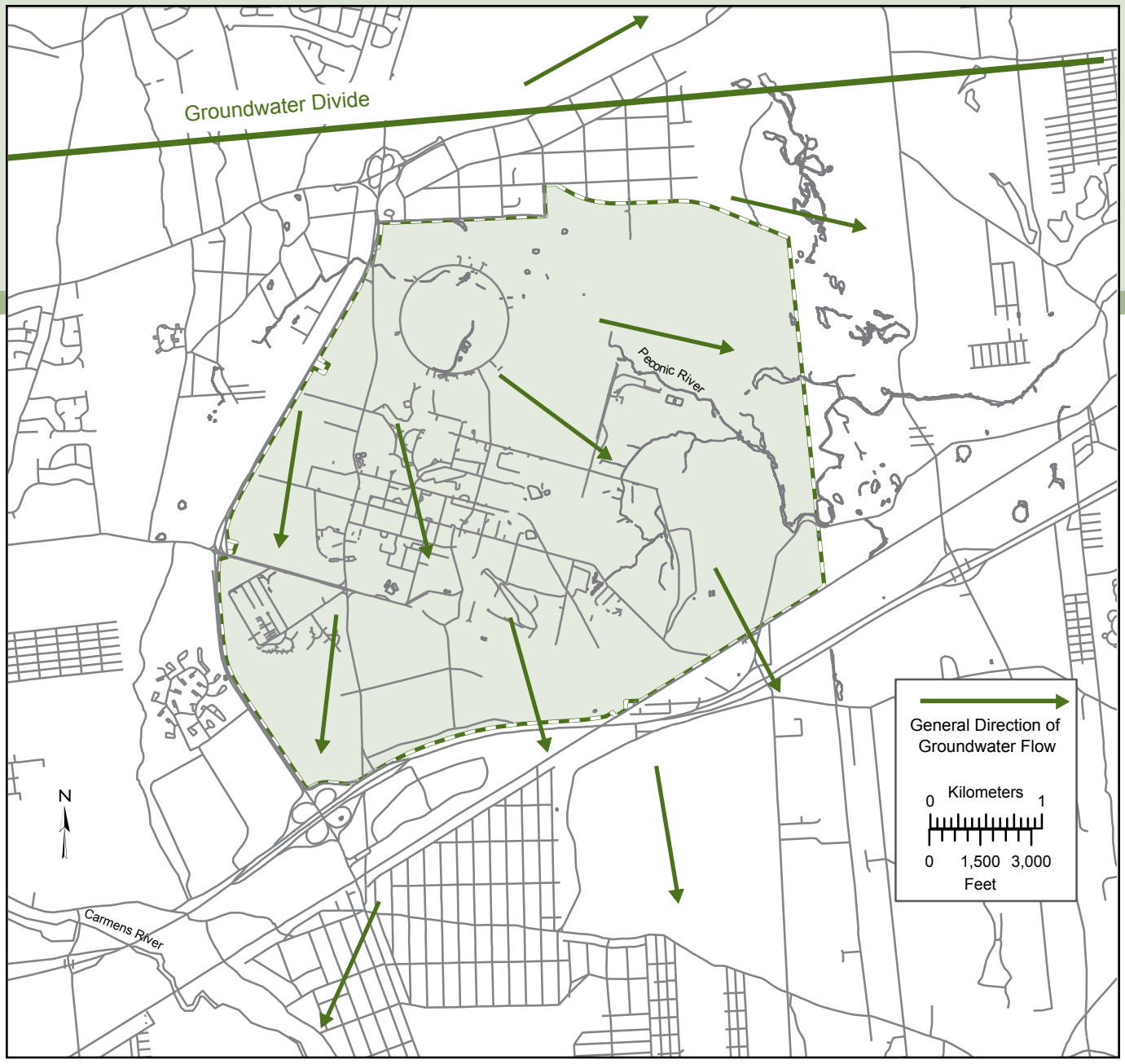


Precipitation Cycle in the Area of Brookhaven National Laboratory

evaporation (cooling tower and wind losses), and sewer line losses account for the remaining 25 percent. An additional 4.9 million gallons of groundwater are pumped each day from remediation wells for treatment and then returned to the aquifer by way of recharge basins.

Groundwater flow directions across the site are influenced by natural drainage systems that flow eastward along the Peconic River, southeast toward the Forge River, and south toward the Carmans River. Pumping from on-site supply wells affects the direction and speed of groundwater flow, especially in the central, developed areas of the site. The main groundwater divide on Long Island is aligned generally east–west and lies approximately one-half mile north of BNL. Groundwater north of the divide flows northward and discharges to the Long Island Sound. Groundwater south of the divide flows east and south, discharging to the Peconic River, Peconic Bay, south shore streams, Great South Bay, and Atlantic Ocean. In most areas at the Laboratory, the horizontal velocity of groundwater is approximately 0.75 to 1.2 feet per day. This means that groundwater travels for approximately 20 to 22 years as it moves from the central, developed area of the site to the BNL southern boundary.

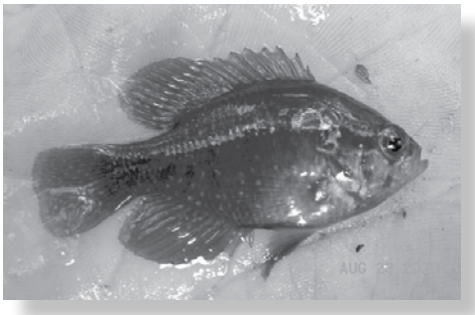
BNL Groundwater Flow Map



Wildlife Programs at BNL

Eastern Hognose Snake (Heteroden platyrhinos).

Banded Sunfish (Enneacanthus obesus). This fish was released immediately after the photo was taken.



Eastern Tiger Salamander (Ambystoma t. tigrinum).

Under BNL's Natural Resource Management Program, the Laboratory focuses on protecting New York State threatened and endangered species on site, and continuing it's leadership role within the greater Long Island Central Pine Barrens ecosystem.

A wide variety of vegetation, birds, reptiles, amphibians, and mammals inhabit the BNL site. The only New York State endangered species confirmed at the Laboratory is the eastern tiger salamander, although the Persius duskywing butterfly and the crested fringed orchid have been identified on site in the past. Several New York State threatened species identified at the Laboratory include the banded sunfish, swamp darter (a fish), stiff goldenrod plant, and northern harrier. The Pine Barrens bluet was confirmed at one of the many coastal plain ponds located on site in 2005. The frosted elfin butterfly has been identified as possibly being at the Laboratory, based on historic documentation and the presence of its preferred habitat and host plant (wild lupine). In addition, stargrass has historically been found and is likely to persist. Several other species that are listed by New York State as rare, species of special concern, or exploitably vulnerable are known to inhabit the site, visit during migration, or have historically been identified.

The Laboratory has precautions in place to protect on-site habitats and natural resources. Activities to eliminate or minimize negative effects on sensitive or critical species are either incorporated into BNL procedures or into specific program or project plans. Environmental restoration efforts remove pollutant sources that could contaminate habitats. Human access to critical habitats is limited. In some cases, habitats are enhanced to improve survival or increase populations. Even routine activities such as road maintenance are not undertaken until they have been evaluated and determined to be unlikely to affect habitat.

BNL sponsors a variety of educational and outreach activities involving natural resources. These programs are designed to help participants understand the ecosystem and to foster interest in science. Wildlife programs are conducted at the Laboratory in collaboration with DOE, local agencies, colleges, and high schools. Ecological research is also conducted on site to update the current natural resource inventory, gain a better understanding of the ecosystem, and guide management planning.

In 2006, interns worked on a variety of projects including: surveying dragonflies and damselflies, radio tracking turtles, analyzing the water chemistry of coastal plain ponds, investigating turtle and amphibian diseases, investigating the loss of the southern leopard frog on Long Island, genetics of resident gray and red fox at BNL, effects of insect damage on chlorophyll production in oak trees, and studying various ecological aspects of forest health.

Twelve-spotted Skimmer (Libellula pulchella).

Also in 2006, teachers from Suffolk County school districts launched the GREEN Institute Open Space stewardship Program in their schools. GREEN stands for "Gaining Research Experience in the ENvironment." The new program, initiated by BNL's Office of Educational Programs, aims to foster partnerships between schools and land stewards in thir local communities. Students in grades K through 12 perform environmental research on undeveloped land owned either by a public or private agency, and report their findings back to that agency.

Gray fox (Urocyon cinereoargenteus)

White-tailed Deer (Odocoileus virginianus).

Upton Ecological and Research Reserve

In 2000, the Upton Ecological and Research Reserve was established on site by DOE and managed by the U.S. Fish and Wildlife Service (FWS) to conduct resource management programs for the conservation, enhancement, and restoration of wildlife and habitat. The 530 acre reserve is located on the eastern boundary of BNL and is home to a wide variety of flora and fauna. It contains wetlands and is largely within the core preservation area of the Long Island Central Pine Barrens. Based on a biological survey of the Laboratory, the reserve is home to more than 200 plant species and at least 162 species of mammals, birds, fish, reptiles, and amphibians.

A transition from FWS management of the Upton Reserve to management by BNL and the Foundation for Ecological Research in the Northeast (FERN) occurred in 2005. During that year, FERN initiated its first pine barrens-wide monitoring program to assess the health of the various forest types within the Pine Barrens. To date, FERN has established 91 permanent plots as part of its monitoring program and is currently analyzing the data. These plots allow for the periodic assessment of forest health to determine whether management actions are having a positive or negative impact. One significant finding is the lack of forest regeneration. In virtually every forest type, there is a lack of survival of trees from seedlings through to saplings. This is likely a result of either deer over-abundance or lack of sunlight penetrating to the understory. Further information on the forest health initiative, as well as other activities of FERN, are available on the FERN website, at www.fern-li.org.

Educational programs have been a significant part of the Upton Reserve. Research on oak tree defoliators that was initiated by FWS and the Upton Reserve is continuing at the Laboratory. Much of the oak forest on site and immediately east of BNL has been subject to repeated defoliation by gypsy moth and orange-striped oak moth. This double defoliation, if it occurs year after year, can kill large sections of oak forest. Beginning in 2003, death of tree oaks was documented. Due to continued defoliation, oak mortality is now estimated at greater than 25 percent in many areas in the northeast quadrant of the Laboratory. The amount of defoliation increased in 2006, with a second year of defoliation by a geometrid moth that became established in 2005.

Research supported by FERN in 2006 included an investigation into the microbial world of soils located within the former Gamma Forest. This microbial research carried out by a scientist at Dowling College, identified several new species of fungus and bacteria that had not previously been known. Future work in the area of microbial diversity is expected to identify additional new species across the Pine Barrens.

World War I Trenches

From 1917 through 1920, the site of what is now the Laboratory was the U.S. Army's Camp Upton. Named for Civil War General Emory Upton, Camp Upton was one of 16 U.S. Army training camps. Here, recruits mostly from the New York metropolitan area were trained for the famed 77th Infantry Division, also known as the Liberty Division, which began leaving Camp Upton for fighting in France in March 1918.

Training included marching, weapons-use and, among other techniques, trench warfare. Trench warfare was a form of combat in which armies dug zig-zagging lines of interconnected ditches. Within these trenches, troops lived in muddy water, among rats and lice while defending their territory and combating their opponents.

The trenches shown here may be some of the only surviving examples of WWI earthworks in the U.S., and they have been determined to be eligible for listing on the National Register of Historic Places.

BNL's Cultural Resource Management Program

The Cultural Resource Management Program at BNL ensures that the Laboratory fully complies with numerous historic preservation requirements. A Cultural Resource Management Plan (CRMP) for BNL was approved by DOE in 2005, and is used to guide the management of all of the Laboratory's historic resources. These resources include World War I trenches, the Camp Upton Historical Collection, scientific equipment, photo/audio/video archives, and institutional records.

BNL currently has three facilities that have been determined to be eligible for listing on the National Register of Historic Places: the Brookhaven Graphite Research Reactor complex, the High Flux Beam Reactor complex, and the World War I training trenches associated with Camp Upton. The training trenches at BNL are examples of the few surviving WWI earthworks in the United States.

As cultural resources are identified, plans for their long-term stewardship are developed and implemented. Achieving these goals ensure that the contributions BNL and the BNL site have made to our history and culture are documented.

Activities under this program in 2006 included:

- Completing a National Historic Preservation Act (NHPA) Section 106 review of the remaining Camp Upton–era buildings at BNL. The review determined that none of the structures were eligible for listing on the National Register.
- A NHPA Section 106 Determination of Effects was performed to address decommissioning of the High Flux Beam Reactor (HFBR). The decommissioning action was determined to have "Adverse Effects" for its historical status, as defined by the NHPA regulations. Therefore, the Laboratory and DOE will be entering into consultation with the New York State Historic Preservations Officer to discuss ways of mitigating the adverse effects to this historic resource.
- In accordance with the guidelines prescribed in the BNL CRMP, an archaeological survey of the proposed site of NSLS-II was performed in December 2006. A total of 356 shovel test pits were dug over the 24-acre area. Based on the results of the survey, no further archaeological investigations were recommended.
- Cultural resource management concepts were strengthened by integrating specific strategies into the Laboratory's maintenance planning and scheduling programs.
- Presentations on the Laboratory's cultural resources and tours of the WWI trenches were provided and presentations were given at local fairs.
- An article featuring BNL cultural resources was published in the DOE newsletter 'Partners In Preservation', April 2006 edition.

BNL's Environmental Management System

One of BNL's highest priorities is ensuring that the Laboratory's environmental performance measures up to its world-class status in science. An Environmental Management System (EMS) was established at the Laboratory in 2001 to ensure that environmental issues are systematically identified, controlled, and monitored. BNL's EMS also provides mechanisms for responding to changing environmental conditions and requirements, reporting on environmental performance, and reinforcing continual environmental improvement.

The Laboratory also has an Integrated Safety Management System (ISMS) in place that integrates environment, safety, and health management into all work planning. The integrated safety processes within ISMS contributed to BNL's EMS achieving the International Organization for Standardization (ISO) 14001 registration and the Laboratory's Safety and Health Program achieving Occupational Safety and Health Assessment Series (OHSAS) 18001 registration.

BNL was the first laboratory under the DOE Office of Science to become officially registered to the ISO 14001 standard. Annual independent audits, which are required to maintain the registration, are conducted to validate that BNL's EMS is being maintained and to identify evidence of continual improvement. In 2006, an EMS surveillance audit determined that the Laboratory continues to conform to the standard. During the audit, eight examples of BNL's continual improvement were highlighted, including the Laboratory's commitment to fund pollution prevention and safety projects, improved methods for addressing corrective actions, the use of lessons learned, and management's response to comments and suggestions from employees. There were two minor nonconformances in document control and management review and two opportunities for improvement in "objectives, targets and programs," and "nonconformances." A corrective action plan was prepared to track the minor nonconformances to closure.

The Laboratory's strong Pollution Prevention (P2) Program is an essential element for the successful implementation of BNL's EMS. The P2 Program reflects the national and DOE pollution prevention goals and policies, and represents an ongoing effort to make pollution prevention and waste minimization an integral part of the BNL operating philosophy.

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Certificate of Registration

This certifies that the Environmental Management System of

Brookhaven National Laboratory

Building 460 Brookhaven Avenue
P.O. Box 5000
Upton L.I., NY 11973-5000 US

has been assessed by NSF-ISR and found to be in conformance to the following standard(s):

ISO 14001:2004

Scope of Registration:

Facilities, experiments, and operations managed by Brookhaven Science Associates at Brookhaven National Laboratory in accordance with the Environmental Management System.

Industrial Classification:

IAF: 34
SIC: 8733
NACE:

ANAB ACCREDITED

Certificate Number: 69525-E3
Certificate Issue Date: 08/10/2005
Company Initial Date: 07/10/2001
Registration Date: 06/25/2004
Expiration Date*: 06/24/2007

Signature on file

Christian B. Lupo, General Manager
NSF-ISR, Ltd.

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Environmental Management Programs

BNL's Environmental Management Program consists of several Laboratory-wide and facility-specific environmental monitoring and surveillance programs. These programs identify potential pathways of public and environmental exposure and evaluate the impacts BNL activities may have on the environment. An overview of the Laboratory's environmental programs and a summary of performance for 2006 follows:

BNL's P2 accomplishments in 2006 include:

- *Three P2 awards from the DOE Office of Science:*
  - *"Best in Class" award for "On-Site Reuse of Concrete from Demolition Projects for New Construction Projects"*
  - *Noteworthy Practice for "Environmental Stewardship: Expanding the Envelope of the BNL Environmental Management System (EMS) Through Voluntary Participation"*
  - *Noteworthy Practice for "Animal Bedding Composting"*
- *Several jointly funded P2 projects, which greatly decreased both environmental and safety risks to the Laboratory:*
  - *Disposal of a researcher's #6 fuel oil and biofuels at the Central Steam Facility*
  - *On-site recycling of more than 5,000 tons of concrete from building demolition projects for use as a base material for parking lots for two new Laboratory buildings*
  - *Replacement of Halogen 1211 fire extinguishers*
  - *Disposal/replacement of BNL's Weather Station mercury barometer*
  - *Purchase of an Animal Bedding Facility dumpster to allow for composting*
- *A National Partnership for Environmental Priorities (NPEP) Achievement award for reducing mercury waste generation and reducing the inventory of PCBs. NPEP encourages public and private organizations to form voluntary partnerships with the U.S. Environmental Protection Agency (EPA) to reduce the use or release of any of 31 priority toxic chemicals and metals identified by the EPA. The goal of the program is to reduce the use or release of four million pounds of these substances by 2011.*

POLLUTION PREVENTION PROGRAM

The Laboratory's Pollution Prevention (P2) Program represents an ongoing effort to make pollution prevention and waste minimization integral parts of the BNL operating philosophy. Key elements of the Laboratory's P2 Program include:

- Eliminate or reduce emissions, effluents, and waste at the source where possible, and ensure that they are as low as reasonably achievable
- Procure environmentally preferable products (known as "affirmative procurement")
- 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
- Identify funding mechanisms for evaluating and implementing P2 opportunities
- Implement P2 projects
- Improve employee and community awareness of P2 goals, plans, and progress

Eighteen P2 proposals were submitted by employees to the BNL P2 Council for funding in FY 2006. Seven proposals were funded, in addition to four special projects, for a combined investment of approximately $37,200. The anticipated annual savings from these projects is estimated at $74,200, for an average payback period of less than one year. The four special projects were jointly funded with other BNL divisions and significantly limit future environmental and worker safety risks.

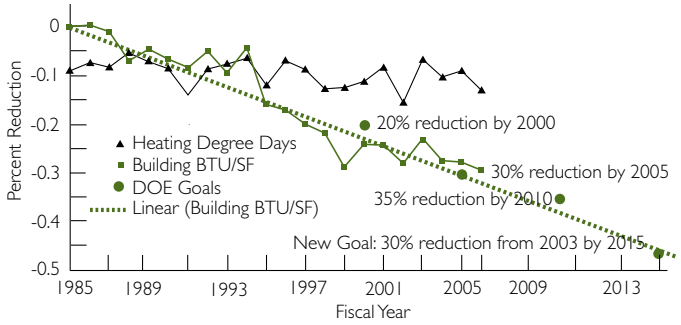
The efforts of the BNL P2 and recycling programs have achieved significant reductions in waste generated by routine operations. This continues a positive trend and is further evidence that pollution prevention planning is well integrated into the Laboratory's work planning process. These positive trends are also driven by the EMS emphasis on preventing pollution and establishing objectives and targets to reduce environmental impacts.

ENERGY MANAGEMENT AND CONSERVATION PROGRAM

Since 1979, BNL's Energy Management Group has been working to reduce energy use and costs by identifying cost-effective and energy-efficient projects, monitoring energy use and utility bills, and assisting in obtaining the least expensive energy sources possible. In 2006, the Laboratory used approximately 242 million kilowatt hours of electricity, 3.2 million gallons of fuel oil, 36 thousand gallons of propane, and 108 thousand ft^3 of natural gas. Due to market conditions, fuel oil was predominately used in 2006, resulting in a cost savings of approximately $1,637,000.

BNL is a participant in the New York Independent System Operator (NYISO) Special Case Resource Program. Through this program, the Laboratory has agreed to reduce electrical demand during critical days throughout the summer when NYISO expects customer demand to meet or exceed the company's available supply. In return, BNL receives a rebate for each megawatt reduced on each critical day. In 2006, participation in this program produced a rebate of $165,000, with a 6.5 kw of load reduction.

BNL also maintains a contract with the New York Power Authority (NYPA). Participation in NYPA's 2006 Load Curtailment Program produced savings of over $20 million. The National Energy Conservation Policy Act requires federal agencies to apply energy conservation measures and to improve federal building design to reduce energy use per square foot. Current goals at BNL are to reduce energy consumption per square foot, relative to 2003, by 2 percent per year from FY2006—FY2015.



Building Energy Performance, 1985 – 2015

BNL will continue to seek alternative energy sources to meet its future energy needs, support federally required "green" initiatives, and reduce energy costs.

WASTE MANAGEMENT PROGRAM

Wastes are produced as a byproduct of the research BNL conducts. These wastes include materials common to many businesses and industries, such as aerosol cans, batteries, paints, and oils. However, BNL's unique scientific activities also generate waste streams that are subject to additional regulation and special handling, including radioactive, hazardous, and mixed waste.

The Laboratory's Waste Management Facility is responsible for the collection, transportation, storage, and off-site disposal of generated waste. The facility is used for the short-term storage of these wastes before they are packaged or consolidated for off-site shipment to permitted treatment and disposal facilities. In 2006, BNL generated the following types and quantities of waste from routine operations:

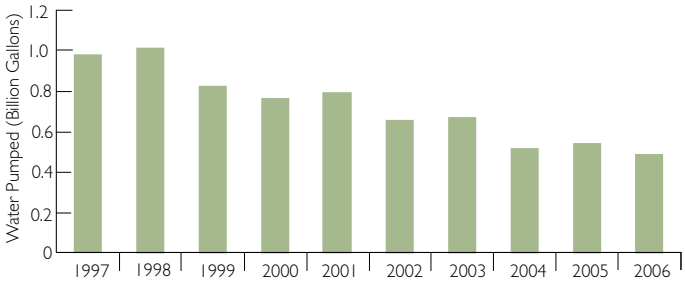
- Hazardous waste: 3.9 tons
- Mixed waste: 8.9 ft^3
- Radioactive waste: 3,678 ft^3

These hazardous and mixed wastes represent a significant reduction from previous years. The radioactive waste quantity for routine operations increased in 2006, but remained below quantites typically generated in previous years. This increase is attributed to increased funding and resulting operations within the high-energy nuclear physics program. BNL will continue to clean up facilities and areas containing radioactive and chemical contamination to further reduce these quantities.

WATER CONSERVATION PROGRAM

BNL has a strong Water Conservation Program in place. The Laboratory evaluates water conservation efforts when planning facility upgrades and new construction projects. These efforts include more efficient and expanded use of chilled water for cooling, ventilation, and air conditioning.

Water conservation initiatives have greatly reduced potable (drinking) water use at the Laboratory since the mid 1990s. As of 2006, BNL used less than half the water used in 1997—a reduction of nearly a half-billion gallons.



BNL Water Consumption Trend

EPA PERFORMANCE TRACK PROGRAM

BNL was accepted into the EPA's Performance Track (PTrack) Program in 2004. The program recognizes top environmental performance among participating U.S. facilities of all types, sizes, and complexity, both public and private. It is considered the "gold standard" for facility-based environmental performance—a standard that participating members strive to attain as they "meet or exceed their performance commitment." Under this program, partners provide leadership in many areas, including preventing pollution at its source. The PTrack Program requires that sites commit to several improvement goals for a 3-year period and report on the progress of these goals annually.

Progress in 2006 included:

- *Increasing land and habitat conservation.* Fifteen acres of forest were returned to fire rotation through a prescribed burn conducted in October. Prescribed burns improve the health of the forest and allow for forest regrowth by removing dead vegetation, eliminating underbrush and leaf litter, and opening the forest floor to new growth. In addition, an acre of land was restored during building demolition. To date, the Laboratory has recovered or returned to fire rotation a total of 42 acres of land.

- *Reducing Radioactive Air Emissions.* BNL had a performance goal to reduce radiological emissions from the Brookhaven Linear Isotope Producer (BLIP) by less than 30 percent. The emissions data confirmed that the overall reduction in emissions ranged between 29 and 35 percent under normal operating conditions. BNL will continue to evaluate additional measures to reduce emissions.
- *Reducing the use of ozone-depleting substances (ODS), specifically Class I ODS.* In total, BNL eliminated 35.5 tons of Class I ODS from 2003 through 2006, which surpassed the original goal by 5.5 tons. In addition, 117 Halon 1211 portable extinguishers were removed from service. BNL's long-term goal is to replace all Halon 1211 portable extinguishers with ABC dry-chemical or with clean agent FE-36 extinguishers by the end of 2010.
- *Reducing hazardous materials use.* The Laboratory continued to revise its baseline inventory of mercury and mercury-containing devices, as new devices were located or identified. Of the 499 pounds subject to this commitment, 194 pounds were determined to be essential and 305 pounds nonessential. By the end of 2006, BNL had removed and recycled approximately 233 pounds of elemental mercury from the nonessential inventory, resulting in a remaining total inventory of 266 pounds. In total, 47 percent of the mercury inventory was eliminated. While the goal of 80 percent was not achieved, the reduction effort was notable.

COMPLIANCE MONITORING PROGRAM

BNL's Regulatory Compliance Program ensures that the Laboratory complies with more than 100 sets of federal, state, and local environmental regulations, numerous site-specific permits, equivalency permits for the operation of 12 groundwater remediation systems, and several other binding agreements. BNL is committed to maintaining full compliance with these requirements and agreements to help eliminate or minimize any impact Laboratory operations may have on the environment. Under this program, compliance monitoring is conducted to ensure that air emissions, wastewater effluents, and groundwater monitoring data comply with regulatory limits issued under the federal Clean Air Act, Clean Water Act, Oil Pollution Act, Safe Drinking Water Act, and associated New York State programs. In 2006, BNL fully complied with the majority of these requirements, and instances of noncompliance were reported to regulatory agencies and corrected expeditiously.

Compliance monitoring in 2006 showed that emissions of nitrogen oxides, carbon monoxide, particulate, and sulfur dioxide were all within permit limits. Approximately 132 pounds of ozone-depleting refrigerants were recovered from refrigeration equipment for recycling on site or offered for use by other DOE or federal facilities. In addition, one hundred sixteen 17-pound and four 13-pound Halon 1211 portable fire extinguishers were removed from service and have been made available to other DOE facilities.

Monitoring of the potable water supply showed that all drinking water quality requirements were met. Groundwater monitoring at the Major Petroleum Facility continued to demonstrate that current oil storage and transfer operations are not affecting groundwater quality. With the exception of three minor permit excursions at the Sewage Treatment Plant and at one recharge basin, liquid effluents discharged to surface water and groundwater met all applicable State Pollutant Discharge Elimination System (SPDES) permit requirements. The three SPDES excursions at the Sewage Treatment Plant included two for total nitrogen, and one for iron. These excursions were investigated by BNL staff, corrected where possible, and reported to the New York State Department of Environmental Conservation (NYSDEC) and the Suffolk County Department of Health Services (SCDHS). The final excursion at the recharge basin was for non-reporting of oil and grease data. The contract analytical laboratory conducting the analysis was unable to report a valid result due to quality control issues.

Efforts to reduce spills continue to be effective. Reportable spills were reduced by 50 percent, from 14 in 2005 to 7 in 2006. There were four reportable spills involving very small volumes of ethylene glycol spilled from employee- or Laboratory-owned vehicles, two releases from hydraulic systems on earth-moving equipment, and one spill of diesel fuel from a Fire Rescue off-road vehicle. All releases were cleaned up or addressed to the satisfaction of NYSDEC. The total number of spills was reduced by 21 percent, from 34 spills in 2005 to 27 in 2006.

Ten external environmental audits were conducted by regulatory agencies in 2006, including inspections of BNL's potable water system, Sewage Treatment Plant operations, several State Pollutant Discharge Elimination System-regulated outfalls, the Major Petroleum Facility, Chemical Bulk Storage Facilities, and the hazardous waste program. No formal notices of violation or enforcement actions were issued as a result of these inspections. The Laboratory took immediate corrective actions to address two conditions identified during a NYSDEC inspection of the Major Petroleum Facility. The two conditions that required corrective action included management of vegetative growth in the secondary containment berms at Building 610, and the need to further evaluate the secondary containment system for tanks 5 and 6, based on results of in depth integrity tests performed to ensure that the secondary containment systems will adequately impede the migration of oil in the event of a spill. Two Notices of Violation (NOV) were received in May for excursions of opacity standards at the Central Steam Facility that were reported in 2005. Since corrective actions addressed all future opacity problems, the NOVs were considered closed upon issuance.

AIR QUALITY PROGRAM

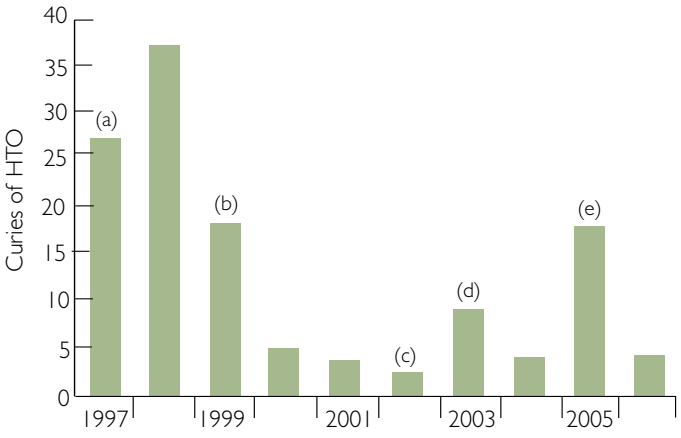
BNL monitors radioactive emissions at three facilities on site to ensure compliance with the requirements of the Clean Air Act. During 2006, BNL facilities released a total of 4,410 curies of radioactive gases; all with short half-lives of less than 30 minutes. Environmental Protection Agency (EPA) regula-

tions require continuous monitoring of all sources that have the potential to deliver an annual radiation dose greater than 0.1 mrem to a member of the public. All other facilities capable of delivering any radiation dose require periodic confirmatory sampling. Although the dose to the public is less than 0.1 mrem and monitoring is not required by EPA, the Brookhaven Linac Isotope Producer (BLIP) is continuously monitored. Oxygen-15 (half-life: 122 seconds) and carbon-11 (half-life: 20.48 minutes) emitted from the BLIP constituted more than 99.9 percent of BNL's radiological air emissions for 2006. The combined emissions were approximately 35 percent higher than in 2005, primarily due to five additional weeks of operation.

At BNL, radiological air emissions monitoring is conducted at one other active facility, the Target Processing Laboratory (TPL), and one inactive facility, the High Flux Beam Reactor (HFBR). As in past years, releases from the TPL in 2006 continued to be very small (0.0035 µCi). Tritium releases from the HFBR in 2006 decreased substantially from releases in 2005, from 17.9 Ci to 4.03 Ci, following the previous downward trend in 2004. An investigation determined that the probable source for the rise in 2005 was the evaporation of residual heavy water through an open drain-tank vent line, which was subsequently closed.

The Laboratory conducts ambient radiological air monitoring to verify local air quality and assess possible environmental and health impacts from BNL operations. Air monitoring stations around the perimeter of the site measure tritium and gross alpha and beta airborne activity. Results for 2006 continued to demonstrate that on-site radiological air quality was consistent with off-site measurements and with results from locations in New York State that are not located near radiological facilities.

Various state and federal regulations governing nonradiological releases require facilities to conduct periodic or continuous emission monitoring to demonstrate compliance with emission limits. The Central Steam Facility (CSF) is the only BNL facility that requires this monitoring. Two of the four boilers at the CSF are equipped with continuous emission monitors to measure nitrogen oxide emissions and opacity. In 2006, these monitors measured no periods of excess nitrogen oxide or opacity.



Notes: (a) Shut down during evaluation process
(b) Permanent shutdown of the HFBR announced in November 1999
(c) Frequency of sampling reduced to one week per month in 2002
(d) Temporary increase due to decommissioning activities
(e) Increase thought to be due to evaporation of residual heavy water from a drain-tank vent line

High Flux Beam Reactor Tritium Emissions, 10-Year Trend, 1997 – 2006

Because natural gas prices were lower than residual fuel oil prices from June through October in 2006, BNL used natural gas for most heating and cooling needs during these months. As a result, annual facility emissions of particulate matter, nitrogen oxides, and sulfur dioxide were considerably lower than in years when residual fuel oil was predominantly used.

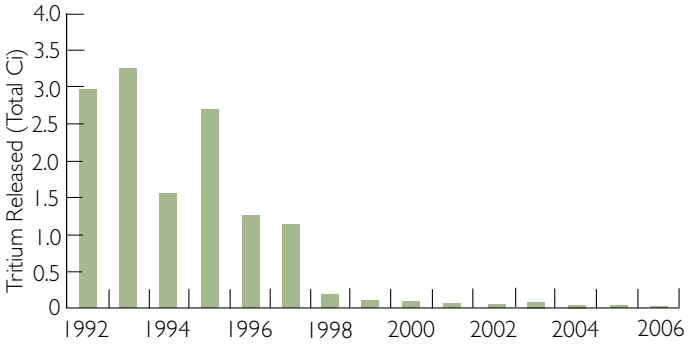
WATER QUALITY SURVEILLANCE PROGRAM

BNL discharges wastewater treated at the Sewage Treatment Plant (STP) into the headwaters of the Peconic River, and non-contact cooling water and storm water runoff to groundwater via recharge basins. Some wastewater may contain very low levels of radiological, organic, or inorganic contaminants. Monitoring, pollution prevention, and careful operation of treatment facilities ensure that these discharges comply with all applicable requirements and that the public, employees, and the environment are protected.

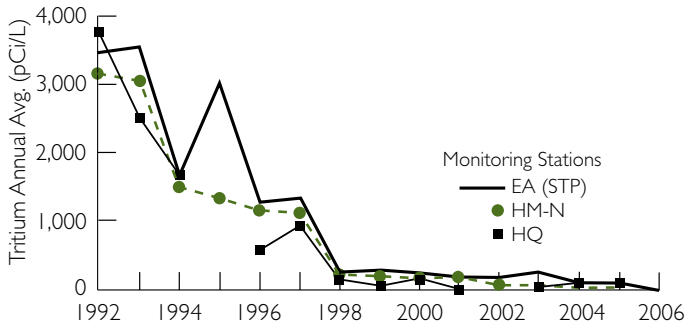
To assess the potential impact of discharges on the water quality of the Peconic River, surface water monitoring is conducted at several locations upstream and downstream of the STP point-source discharge. The Carmans River, located to the west of BNL, is monitored as a geographical control location for comparative purposes, as it is not affected by Laboratory operations.

In 2006, the average gross alpha and beta activity levels in the STP discharge were well below drinking water standards. Tritium releases to the Peconic River continued to decline in 2006 and were the lowest ever recorded due to the continued decommissioning and decontaminating at the High Flux Beam Reactor (HFBR). Although tritium was not detected at the influent or effluent for most of 2006, low concentrations were detected in the STP discharge in December. Investigations did not reveal any single source, but did identify several low-concentration sources, which when combined, may have resulted in this slight increase. The maximum concentration of tritium released was approximately 7.5 percent of the drinking water standard. There were no detections of cesium-137 (Cs-137), strontium-90 (Sr-90), or other gamma-emitting nuclides in the STP effluent.

On-site recharge basins are used for the discharge of "clean" wastewater streams, including once-through cooling water, storm water runoff, and cooling tower blow-down, and are suitable for direct water recharge to the aquifer. Radiological analyses in 2006 showed that the low levels of gross alpha and beta activity detected in most of water discharged to the basins were attributable to naturally occurring radionuclides, such as potassium-40, and not to BNL operations. Very low levels of tritium were detected in a single sample collected at one of the recharge basins (430 pCi/L). Considering the low level of detection and analytical method uncertainties, positive identification of tritium in this sample is questionable.



Tritum Released to the Peconic River, 15-Year Trend, 1992 – 2006



Notes:
NYS Drinking Water Standard is 20,000 pCi/L.
There were no samples collected at monitoring Station HQ in 1995 and 2002 due to low water table conditions.

Sewage Treatment Plant/Peconic River Annual Average Tritium Concentrations, 1992 – 2006

In 2006, nonradiological analyses of water directed to the recharge basins showed low concentrations of volatile organic compounds (VOCs), including disinfection byproducts generated by the use of chlorine for the control of bacteria and algae in cooling water systems. Acetone was also detected, above the minimum detection level (MDL) for most recharge basins. Due to the common use of acetone in analytical laboratories and the finding of acetone in the contract analytical laboratory control samples, confirmation of acetone in waste water samples is questionable.

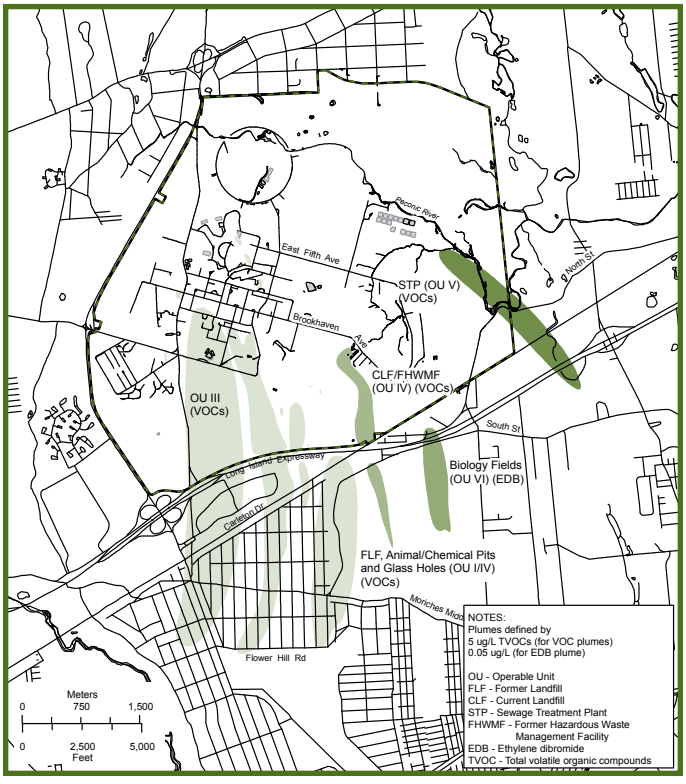
Along the Peconic River, several locations are monitored for radiological and nonradiological parameters to assess overall water quality. Radiological data from Peconic River surface water sampling in 2006 showed that, with the exception of a single detection of gross alpha activity at one upstream station, all parameters were less than the detection limit. While single detections of gross beta activity were reported at two downstream stations, average gross beta measurements were indistinguishable from background measurements. Aluminum, copper, iron, and zinc were present at some locations both upstream and downstream of the STP point-source discharge at concentrations that exceeded the NYS Ambient Water Quality Standards. Mercury was found at very low levels in water samples collected downstream of the STP. As part of the follow-up surveillance activities for the Peconic River remediation project, mercury concentrations in water samples are being evaluated to determine if the levels impact freshwater organisms.

GROUNDWATER PROTECTION MANAGEMENT PROGRAM

The primary goal of BNL's Groundwater Protection Management Program is to ensure that plans for groundwater protection, management, monitoring, and restoration are fully defined, integrated, and managed in a manner that is consistent with federal, state, and local regulations. BNL's extensive groundwater monitoring well network is used to evaluate progress in restoring groundwater quality, to comply with regulatory permit requirements, and to monitor active research and support facilities. In 2006, the Laboratory collected groundwater samples from 852 on- and off-site monitoring wells during 2,337 individual sampling events. BNL has not detected any new impacts to groundwater quality since 2001.

Under the environmental surveillance program, 125 groundwater wells at 10 active research and support facilities were monitored during 240 individual sampling events. Although no new impacts to groundwater quality were discovered in 2006, groundwater quality continues to be impacted from past releases at four facilities. Tritium continues to be routinely detected at concentrations above the 20,000 pCi/L drinking water standard (DWS) in wells immediately downgradient of the g-2 source area in the Alternating Gradient Synchrotron (AGS) facility, although tritium concentrations have shown a steady decline over the past three years. In January 2006, tritium concentrations exceeded the 20,000 pCi/L DWS in one well immediately downgradient of the Brookhaven Linear Isotope Producer (BLIP). However, tritium concentrations at BLIP declined to less than the DWS

Extent of Volatile Organic Compound Plumes.



limit for the remainder of the year. Monitoring data suggest that the continued release of tritium from these areas is due to residual tritium being flushed out of the unsaturated zone close to the water table by natural water table fluctuations. The amount of tritium available to be flushed out of the deep soils appears to be declining. In October 2006, DOE released for public comment a proposed plan to address the sources of tritium and groundwater contamination at g-2 and BLIP. This plan will be finalized in the spring of 2007.

As in previous years, volatile organic compound (VOCs) associated with historical petroleum and solvent spills were detected in several monitoring wells directly downgradient of the Motor Pool and Service Station areas. Monitoring of the leak detection systems at both vehicle maintenance facilities indicated that gasoline storage tanks and associated distribution lines were not leaking. Furthermore, BNL's ongoing evaluation of vehicle maintenance operations indicated that all waste oils and used solvents are being properly stored and recycled.

ENVIRONMENTAL RESTORATION PROGRAM

Under the Environmental Restoration Program, on- and off-site contaminant plumes are monitored to track the progress that the groundwater treatment systems are making toward plume remediation.

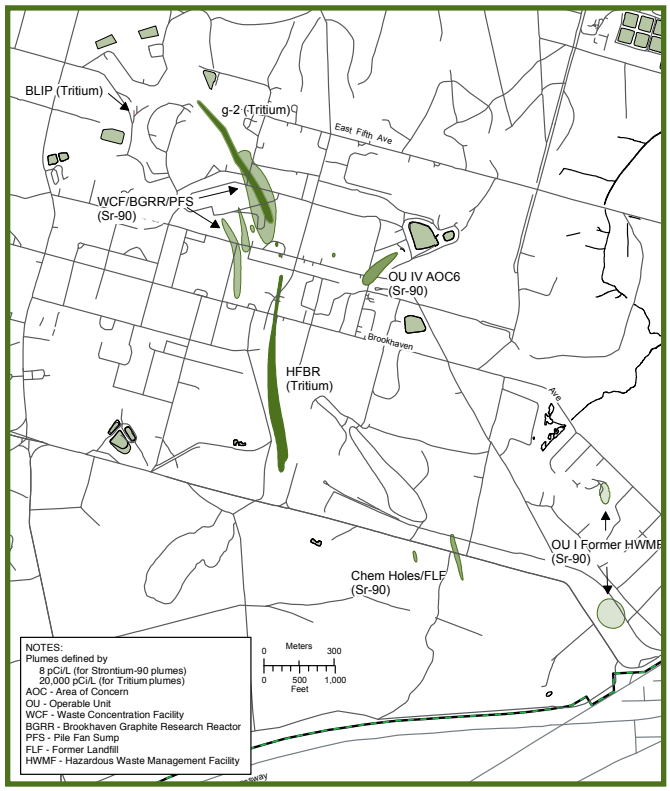
In 2006, 727 groundwater wells were monitored during 2,097 individual sampling events. The Laboratory's groundwater cleanup goals include minimizing plume growth and reducing contaminant concentrations in the Upper Glacial aquifer to below Maximum Contaminant Level (MCL) standards by 2030. For the srontium-90 (Sr-90) plumes associated with the Brookhaven Graphite Research Reactor/Waste Concentration Facility, MCLs must be reached within 70 years. For the Chemical/Animal Holes area, MCLs must be reached within 40 years. Volatile organic compound (VOC) levels in the Magothy aquifer must meet MCLs within 65 years. The cleanup objectives will be met by a combination of active treatment and natural attenuation.

The Laboratory continues to make significant progress in restoring groundwater quality on site, with 13 groundwater remediation systems in active operation. During 2006, 372 pounds of VOCs and 5.3 mCi of Sr-90 were removed from the groundwater, and more than 1.5 billion gallons of treated groundwater were returned to the aquifer. To date, approximately 5,592 pounds of VOCs have been removed from the aquifer.

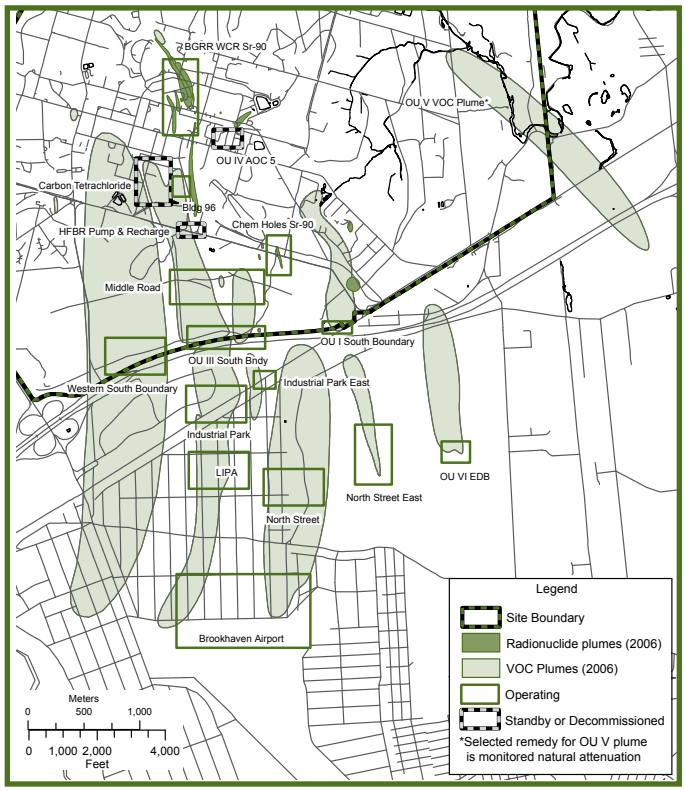
Significant issues associated with the restoration program during 2006 were:

- The Operable Unit (OU) III Record of Decision (ROD) contingency of 20,000 pCi/L for the High Flux Beam Reactor (HFBR) Tritium Plume at Weaver Dive was triggered when tritium was detected at 21,000 pCi/L in a temporary well. A new extraction well will be in operation to treat this area of the plume by the third quarter of 2007.
- Due to the continued presence of high levels of VOCs in the groundwater following three injections of potassium permanganate in the Building 96 source area from December 2004 through January 2006, it appears that additional remedial action will be required in order to meet the cleanup goals. An engineering study to evalu-

Extent of Radionuclide Plumes On Site.

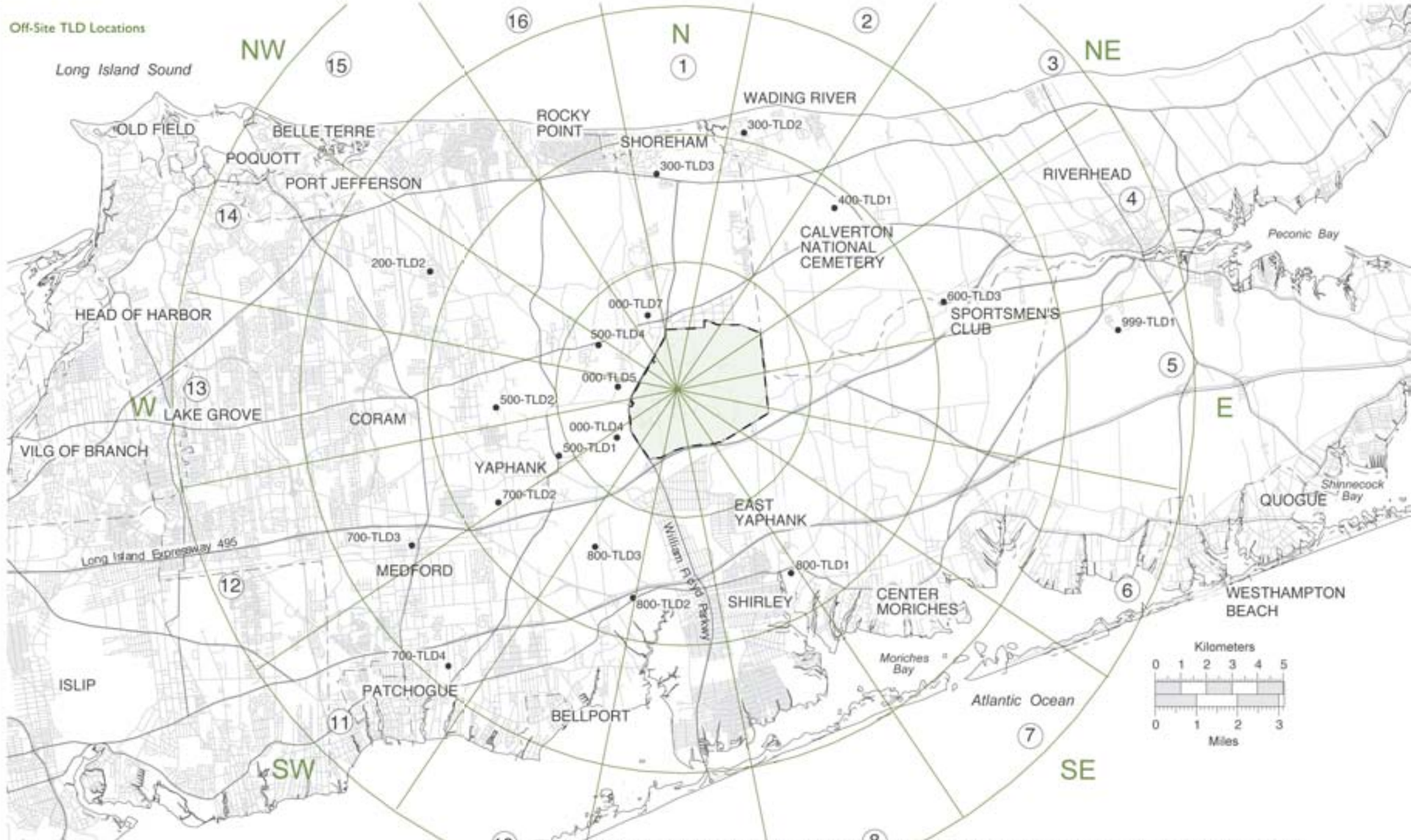


Locations of BNL Groundwater Remediation Systems.



ate possible remedial alternatives will be completed by the end of 2007, and one of the existing extraction wells will be restarted to maintain hydraulic control of groundwater contamination in the source area.

- Continued characterization of the downgradient portions of the Chemical/Animal Holes Sr-90 plume indicated that additional extraction wells are needed in order to achieve the cleanup goals specified in the OU III ROD. Two new wells will be operational by the end of 2007.
- Elevated levels of VOCs were observed in one of the western perimeter wells for the Airport treatment system. Based upon additional groundwater characterization of the plume in this area, an additional extraction well will be installed to allow for complete capture of the plume. The new extraction well will be operational by the third quarter of 2007.
- Two of the OU III South Boundary treatment system extraction wells will be placed in standby mode due to consistently low VOC concentrations in these wells. Combined with the two extraction wells previously placed in standby mode, only three of the seven South Boundary extraction wells remain in full-time operation. All wells placed in standby mode continue to be monitored on a quarterly basis and would be restarted if VOC concentrations rebound.
- Based upon consistently low VOC concentrations in the Industrial Park treatment system area (with concentrations less than the capture goal of 50 ug/L total VOCs [TVOCs]), pulse pumping of the system will begin in 2007, and one of the treatment wells will be placed in standby mode. Only five of the seven Industrial Park treatment wells will remain in full-time operation.
- Based upon consistently low VOC concentrations in two of the Long Island Power Authority (LIPA) treatment system extraction wells and nearby monitoring wells (with concentrations less than the capture goal of 50 ug/L TVOCs), the two extraction wells will be placed in standby mode.



RADIOLOGICAL DOSE ASSESSMENT PROGRAM

BNL routinely assesses its operations to ensure that any potential radiological dose to members of the public, BNL workers, and the environment is "As Low As Reasonably Achievable" (ALARA). All scientific and operational processes and activities that can in any way impact the health and safety, or potentially contribute to radiological dose are reviewed for their environmental impacts.

The potential radiological dose is calculated as the largest possible dose to a hypothetical Maximally Exposed Individual (MEI) at the BNL site boundary. For dose assessment purposes, the pathways include direct radiation exposure, inhalation, ingestion, immersion, and skin absorption. Radiological dose assessments at the Laboratory have consistently shown that the "effective dose equivalent" from operations is well below the Environmental Protection Agency (EPA) and DOE regulatory dose limits for the public and the environment. The dose impact from all BNL activities in 2006 was found to be insignificant above natural background radiation levels.

To measure direct radiation from Laboratory operations, thermoluminescent dosimeters (TLDs) are placed on site and in surrounding communities. In 2006, the average doses from all TLDs showed there was no additional contribution to dose from BNL operations above natural background radiation. The annual on-site external dose from all potential sources, including cosmic and terrestrial radiation, was 68 ± 11 mrem (680 ± 110 µSv), and the annual off-site external dose was 63 ± 9 mrem (630 ± 90 µSv).

The effective dose to the MEI from air emissions was 8.14E-2 mrem (0.81 µSv). The ingestion pathway dose was estimated as 2.96 mrem (30 µSv) from consumption of deer meat and 0.07 mrem (0.7 µSv) from consumption of fish caught on site. The total annual dose to the MEI from all pathways was estimated as 3.11 mrem (31 µSv). The dose from the air inhalation pathway attributable to BNL operations was less than 1 percent of EPA's annual regulatory dose limit of 10 mrem (100 µSv), and the total dose was less than 4 percent of DOE's annual dose limit of 100 mrem (1,000 µSv) from all pathways. Doses to aquatic and terrestrial biota were also evaluated and found to be well below the regulatory limits.

As a part of the National Emission Standards for Hazardous Air Pollutants (NESHAPs) review process at BNL, any source that has the potential to emit radioactive materials is evaluated for regulatory compliance. In 2006, several NESHAPs compliance reviews were performed, including decontamination activities from removal of the Brookhaven Graphite Research Reactor (BGRR) belowground duct liner; a dose assessment to evaluate the potential dose impact (in this case, a firefighter) in the event of an accidental fire at the former Hazardous Waste Management Facility (HWMF); continued decommissioning activities at the High Flux Beam Reactor (HFBR); and a pre-NESHAPS evaluation for emissions of radiological gases from the newly proposed National Synchrotron Light Source-II. All assessments showed there to be no significant dose impacts from these activities.

DOSE IN PERSPECTIVE

Radiological materials are used in many research activities conducted at the Laboratory. This fact sheet explains Brookhaven National Laboratory's (BNL) maximum possible contribution to the radiation dose that a member of the public might receive in any given year and compares that dose to other typical radiation exposures.

What radiation dose might I receive each year?

The radiation dose received by a person is commonly expressed in "rem" or "millirem" (a millirem is one-thousandth of a rem). The average U.S. (and Long Island) resident's radiation dose from natural sources is approximately 300 millirems per year. This originates from natural cosmic and terrestrial radiation, radon, and minerals in food, water, and air. The average U.S. resident is also exposed to about 60 millirems per year from manmade sources, including medical procedures and consumer products. People who smoke tobacco receive a much higher dose, as do people who live in areas where radon is prevalent in the soil or at high altitudes where cosmic radiation is not so effectively shielded by the atmosphere.

Here are some examples of radiation doses from common sources, in millirem per year:

- Cigarette smoking (one pack per day) — 1,300
- Radon from the ground — 200
- Minerals in water, food, and air — 40
- Cosmic radiation — 26
- Chest x-ray — 9
- Fallout from historical worldwide nuclear weapons testing — 1

What radiation dose might I receive from BNL?

The largest hypothetical radiation dose that a member of the public could have received in 2006 from all pathways potentially affected by Laboratory operations—including air, water, deer, and fish — was 3.11 millirems. This is less than 1 percent of the dose Long Island residents receive from natural sources of radiation each year, and less than 4 percent of the limit set by DOE for man-made sources of radiation. The radiation dose is calculated for a hypothetical person living at the Laboratory boundary for the entire year, eating 64 pounds of local deer meat and 15 pounds of fish caught on site.

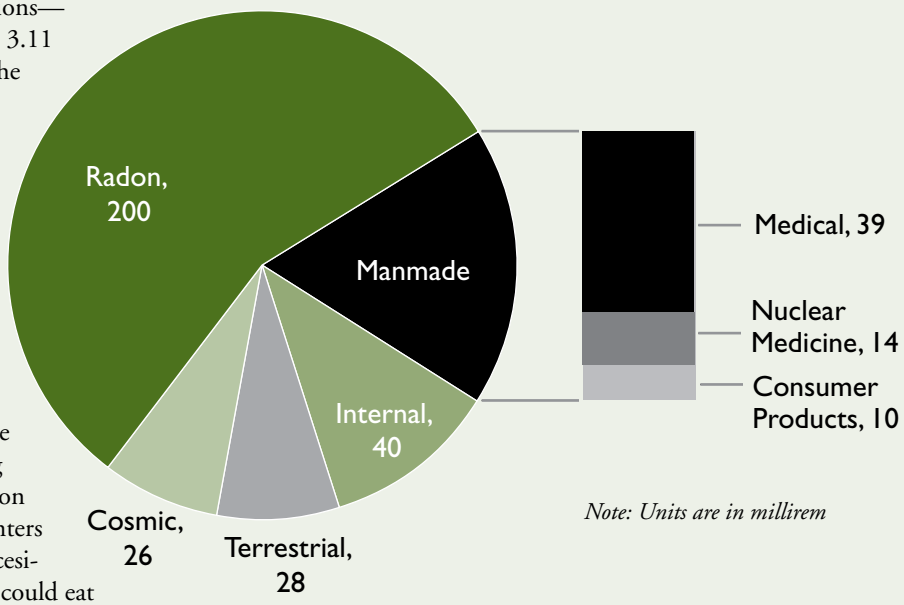
The largest portion of this worst-case dose (1.31 millirems) would result from eating deer meat. (Testing of deer killed by cars on and near Laboratory grounds, and by hunters near the site, shows elevated amounts of cesium-137 in the meat.) However, a person could eat four times as much (256 pounds) and still not exceed the New York State Department of Health "action level" of 10 millirems. In 1999, the state department of health formally concluded that there was no reason to issue health restrictions on consumption of deer taken near the Laboratory. (Hunting is not allowed on site, but deer typically range up to one mile.) The N.Y. State Department of Environmental Conservation and BNL have informed hunters of the test results so they may make their own decisions about whether to eat meat from deer taken near the site.

The radiation dose a person would receive from eating 15 pounds of fish containing cesium-137 at the highest level seen in any part of the Peconic River system would be 0.07 millirem. This dose can be compared to the dose of about 40 millirems a person receives annually from naturally occurring radionuclides in food, air, and water.

The maximum credible radiation dose a member of the public could receive due to Laboratory air emissions in 2006 was 0.08 millirem.

The internal radiation dose from drinking groundwater was expected to be zero. No radionuclides at levels above the Environmental Protection Agency's drinking water standards have been detected off the Laboratory site. On site, there are pockets of groundwater that contain radionuclides; these areas are regularly monitored and drinking water is not drawn from these areas.

For a person to be exposed to even the low levels cited in this fact sheet is an extremely unlikely "worst case" scenario. In reality, it is unlikely that anyone receives the maximum dose from any one pathway, and implausible that anyone receives all of the individual pathway doses together.

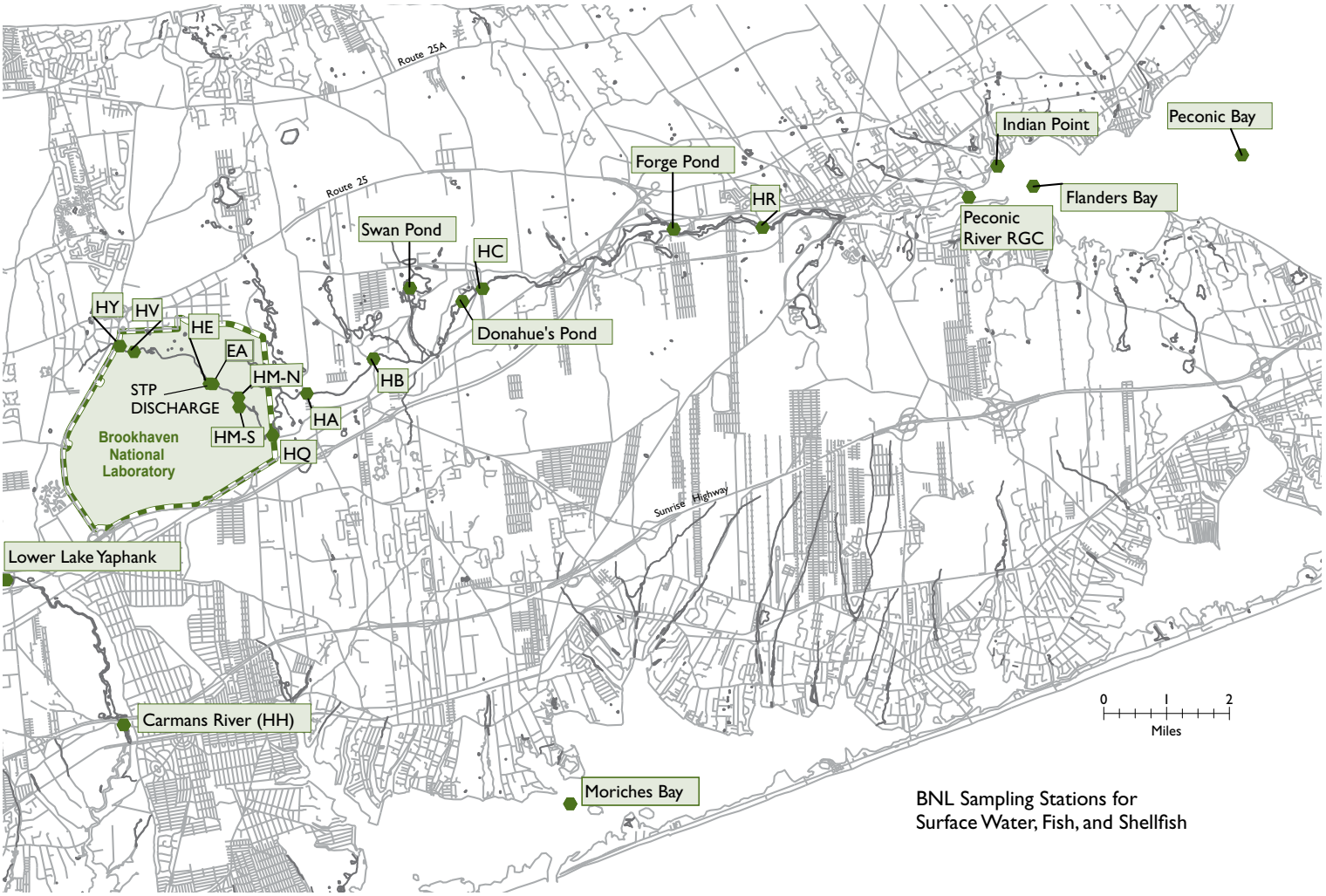


Note: Units are in millirem

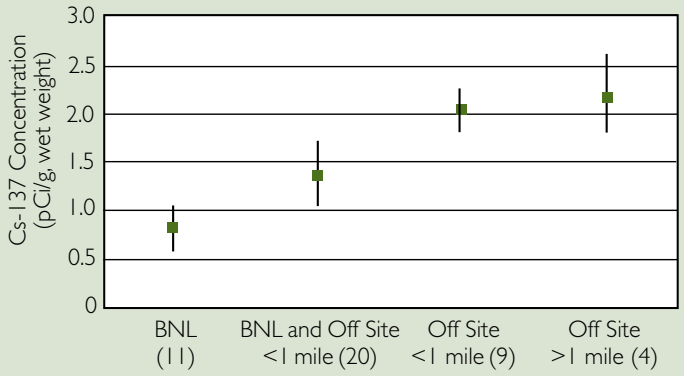
NATURAL RESOURCE MANAGEMENT PROGRAM

The BNL Natural Resource Management Program is designed to promote stewardship of the natural resources found on site and to integrate natural resource management and protection with BNL's scientific mission. The goals of the program include protecting and monitoring the ecosystem, conducting research, and communicating with the public, stakeholders, and staff members regarding environmental issues. BNL conducts routine monitoring of flora and fauna to assess the impact, if any, of past and present activities on the Laboratory's natural resources. Generally, deer sampled on site contain higher concentrations of cesium-137 (Cs-137) than deer sampled from more than 1 mile off site. This is most likely because on-site deer consume small amounts of contaminated soil and graze on vegetation growing in soil where elevated Cs-137 levels are known to exist. A nine-year trend of on-site and near off-site Cs-137 averages in deer meat showed a statistically significant increase in Cs-137 concentrations in deer meat samples in 2006. The unexplained increase was due to a single sample taken off site along the William Floyd Parkway. While the sample was high compared to samples taken within the recent past, it was still within the historic range of samples taken within the same geographic area. There are no known unremediated sources of Cs-137 in the area. Remediation of areas of contaminated soil at BNL began in 2000, and all major areas were remediated by the end of 2005. The New York State Department of Health (NYSDOH) has reviewed the potential public health risk associated with the low levels of Cs-137 in on-site deer and determined that neither hunting restrictions or formal health advisories are warranted. Testing of deer bones for strontium-90 (Sr-90) indicated background levels. BNL will continue to test for Sr-90 in bone to develop baseline information.

In an effort to restore fish populations, the Laboratory suspended most on-site fish sampling in 2001. The reluctance to sample fish continued in 2006, due to impacts of the Peconic River cleanup project and drought conditions in 2005. However, four fish were sampled on site in 2006; although due to the size of the fish, only metals analyses could be performed. Off-site sampling of fish found low levels of Cs-137; all levels of Cs-137 appear to be declining, compared with historic values. Cleanup of both on- and off-site portions of the Peconic River in 2004 and 2005 removed approximately 88 percent of Cs-137 in the sediment, and further decreases in the concentrations of Cs-137, as well as mercury, are expected. Low levels of mercury and pesticides were also detected in off-site fish samples, but did not exceed any standards and do not present a health impact to consumers of such fish. On- and

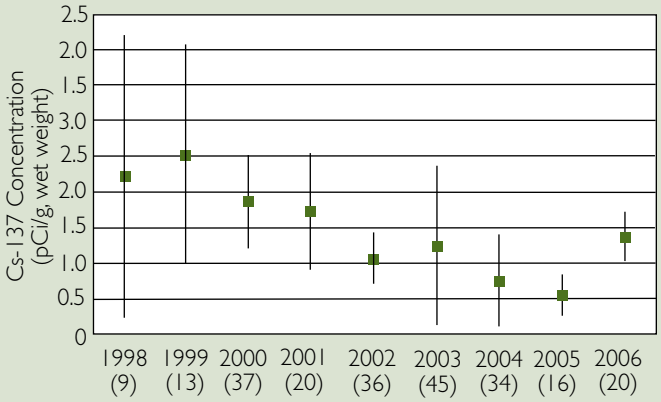


BNL Sampling Stations for Surface Water, Fish, and Shellfish



Notes: Averages are shown for samples collected at BNL, on site and off site within 1 mile, off site but within a 1-mile radius, and off site greater than a 1-mile radius.
Numbers in parentheses indicate the number of samples in that data set.
All values are shown with a 95% confidence interval.

Comparison of Cesium-137 Average Concentrations in Deer, 2006



Notes: Averages are shown for samples collected at BNL, and within 1 mile.
Numbers in parentheses indicate the number of samples in that data set.
All values are shown with a 95% confidence interval.

Cesium-137 Concentration Trends in Deer Meat at BNL and within 1 Mile of BNL, 1998 – 2006

off-site aquatic vegetation and sediments contained low levels of Cs-137, metals, pesticides, and PCBs, in amounts that were consistent with levels detected in previous years.

Under the Peconic River remediation project, sediment from the Peconic River was remediated to remove mercury and associated contaminants from the river. This project was completed in the spring of 2005. Sampling results for 2006 showed that 93 percent of samples analyzed at 16 on-site locations and 14 off-site locations met the cleanup goals of 2.0 mg/kg. Two samples exceeded the goal and another was close to exceeding the goal. Additional samples were collected at these locations which confirmed that mercury levels in this area of the Peconic River exceeded the clean-up goal. Additional sampling procedures to characterize the nature and extent of contamination were prepared for implementation in 2007.

Under the Peconic River remediation project, sediment from the Peconic River was remediated to remove mercury and associated contaminants from the river. This project was completed in the summer of 2005. Sampling results for 2006 showed that 93 percent of samples analyzed at 16 on-site locations and 14 off-site locations met the cleanup goals of 2.0 mg/kg. Two samples exceeded the goal and another was close to exceeding the goal. Additional samples were collected at these locations which confirmed that mercury levels in this area of the Peconic River exceeded the clean-up goal. Additional sampling procedures to characterize the nature and extent of contamination were prepared for implementation in 2007.

Following the completion of the Peconic River remediation project in the summer of 2005, BNL started a routine water column sampling program for mercury, with samples being collected at up to 20 on-and off-site locations during the June and August time periods. Compared to the 2005 baseline sample results, the June 2006 average total mercury and average methyl mercury concentrations were substantially lower in both the on- and off-site locations. The August 2006 average total mercury and average methyl mercury concentrations in the Peconic River were substantially lower than the June 2006 results. Furthermore, the August 2006 total mercury and methyl mercury concentrations were substantially lower in off-site samples compared to samples collected on-site.

Analysis of the Sewage Treatment Plant (STP) effluent samples indicate that the STP discharge contains trace levels of mercury, which may be contributing to the mercury concentrations observed in the on-site section of the river. It is important to note that these trace levels of mercury observed in the effluent are well below the SPDES discharge limit. Additional surface water monitoring and monitoring of the STP effluent will be conducted in 2007.

Wetland monitoring results showed that vegetation restoration along the Peconic River was at 92 percent over 64 monitoring transects with less than one percent coverage of invasive species. Monitoring of invasive species will continue until 2008.

QUALITY ASSURANCE PROGRAM

The multilayered components of the BNL Quality Assurance (QA) Program ensure that all analytical data reported in this document are reliable and of high quality, and that all environmental monitoring data meet quality assurance and quality control objectives.

Samples are collected and analyzed in accordance with Environmental Protection Agency (EPA) methods and standard operating procedures that are designed to ensure samples are representative and the resulting data are reliable and defensible. Quality control in the analytical laboratories is maintained

through daily instrument calibrations, efficiency and background checks, and testing for precision and accuracy. Data are verified and validated as required by project-specific quality objectives before being used to support decision making.

In 2006, the Laboratory used five off-site contract analytical laboratories to analyze environmental samples: General Engineering Lab (GEL), H2M Lab, Severn-Trent Lab (STL), Chemtex Lab, and Brooks Rand. All analytical laboratories were certified by New York State for the tests they performed, and were subject to oversight that included state and national performance evaluation (PE) testing, review of QA programs, and audits.

Four of the contract analytical laboratories participated in several national and state PE testing programs in 2006. Results of the tests provide information on the quality of a laboratory's analytical capabilities. Testing was conducted by Environmental Resource Associates (ERA), the National Voluntary Laboratory Accreditation Program (NVLAP), the voluntary Mixed Analyte Performance Evaluation Program (MAPEP), and New York State Department of Health (NYSDOH) Environmental Laboratory Accreditation Program (ELAP). GEL and STL participated in the ERA radiological program: 95.7 percent of GEL's tests were in the acceptable range and 92.9 percent of STL's tests were in the acceptable range. GEL also participated in the MAPEP evaluations; 88.1 percent of GEL's tests on radiological samples were in the acceptable range and 6.7 percent were in the warning (but acceptable) range.

H2M and GEL participated in the NYSDOH ELAP evaluations of performance on tests of nonpotable water, potable water, and solid wastes. NYSDOH found 98.1 percent of H2M's nonradiological tests to be in the acceptable range and 92.1 percent of GEL's nonradiological tests to be in the acceptable range.

Also in 2006, H2M, STL, and GEL voluntarily participated in the ERA water supply and water pollution studies, although this evaluation is not required for New York State certification. ERA found that 96.2 percent of H2M's tests were in the acceptable range, 94.7 percent of STL's tests were in the acceptable range, and 95.1 percent of GEL's tests were in the acceptable range**.** GEL also voluntarily participated in MAPEP evaluations. These evaluations showed that 98.8 percent of GEL's nonradiological tests were in the acceptable range. H2M voluntarily participated in NIST-NVLAP evaluations. These evaluations showed that 98.0 percent of H2M's nonradiological tests were in the acceptable range.

STL and GEL were audited as part of DOE's Integrated Contract Procurement Team Program. There were no Priority I ("serious") findings for either laboratory. The STL audit resulted in 14 Priority II findings and the GEL audit resulted in 7 Priority II findings. Priority II status indicates problems that do not result in unusable data and do not indicate that the contract analytical laboratory cannot adequately perform services for DOE. Corrective action plans were submitted to DOE by the contract analytical laboratories to document that procedures were put in place to correct the findings.

Communication and Community Involvment Program

Communication and community involvement are commitments under BNL's Environmental Management System. The Laboratory maintains relationships with its employees, key stakeholders, neighbors, elected officials, regulators, and other community members. The goals are to provide an understanding of BNL's science and operations, including environmental stewardship and restoration activities, and to incorporate community input in the Laboratory's decision making.

Summer Sundays at BNL

To facilitate effective dialogue between BNL and key stakeholders, several forums for communication and involvement have been established. The Brookhaven Executive Roundtable (BER), established in 1997 by DOE's Brookhaven Site Office, meets routinely with BNL and DOE. These meetings enable Laboratory and DOE representatives to update local, state, and federal elected officials and regulatory agencies regarding environmental and operational issues, as well as scientific discoveries and initiatives.

The Community Advisory Council (CAC), established by BNL in 1998, advises the Laboratory Director on issues related to the Laboratory that are important to the community. The CAC is composed of approximately 30 member organizations representing business, civic, education, employee, community, and environmental and health organizations. The CAC meets monthly in sessions open to the public, and sets its own agenda in cooperation with the Laboratory.

BNL's Envoy Program educates employee volunteers regarding Laboratory issues and provides a link to local community organizations. Feedback shared by envoys helps BNL gain a better understanding of local community

Annual Pollution Prevention Award

Annual Earth Day Awards Ceremony

concerns. The Speakers' Bureau provides speakers for educational and other organizations interested in the Laboratory, and the Volunteers in Partnership Program supports employee volunteer efforts for charitable organizations. The BNL Summer Sunday tours enable the Laboratory to educate the public by featuring different facilities and program areas each week. In addition, BNL hosts various events annually in celebration of Earth Day.

To keep employees and the community informed about the Laboratory's research, activities, and issues, including those related to the environment, BNL issues press releases; publishes *Laboratory Link*, a monthly update on BNL science and events; *the Bulletin*, a weekly employee newsletter; and *discover Brookhaven*, BNL's quarterly science magazine. The Laboratory maintains an informative website at http://www.bnl.gov, where these publications are posted, as well as information about BNL's science and operations, past and present. In addition, employees and the community can subscribe to the Laboratory's e-mail update service at http://lists.bnl.gov/mailman/listinfo/bnl-announce-1.

2006 SITE ENVIRONMENTAL TEAM

a. The Environmental Information Management Services Group

(From left to right) SusanYoung, Alain Domingo, William Dorsch, Frank Tramontano, and John Burke

b. The Environmental and Waste Management Services Division Field Sampling Team

(From left to right) Robert Metz, Carlee Ogeka, Richard Lagattolla, and Lawrence Lettieri

c. The SER Team

(Back row) Jeffrey Williams, John Burke, Robert Lee, Douglas Paquette, George Goode, William Dorsch, Timothy Green, Balwan Hooda, Mark Davis, and John Selva (Front row) Jennifer Higbie, Patricia Yalden, Arland Carsten, Karen Ratel, and Kathleen Robinson (Jason Remien not pictured)

2006 SITE ENVIRONMENTAL REPORT
READER RESPONSE FORM

The 2006 Site Environmental Report (SER) Summary provides highlights from the Brookhaven National Laboratory 2006 SER report. The report and summary are written to meet the requirements and guidelines of the U.S. Department of Energy and the informational needs of the public.

BNL welcomes your comments, suggestions for improvements, or any questions you may have. Please fill in the information below, and mail your response form to:

Brookhaven National Laboratory
Environmental and Waste Management Services Division
Attention: SER Project Coordinator
Building 120
P.O. Box 5000
Upton, NY 11973-5000

Name _____

Address _____

_____

Phone _____

E-mail _____

Comments, Suggestions, or Questions

_____

_____

_____

☐ I would like to be added to your Environmental Issues mailing list.

BROOKHAVEN
NATIONAL LABORATORY

SER Project Coordinator
Environmental & Waste Management Services Division
Building 120
Brookhaven National Laboratory
PO Box 5000
Upton, NY 11973-5000

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To celebrate Earth Day 2007, students from local schools in grades 3-5 were invited to participate in BNL's annual "Your Environment" art contest. Students were asked to create a poster that focused on cleaning up and protecting Long Island's environment.

The winning posters shown above were created by a) Beichen Liu, Grade 4, Coram Elementary School. b) Eric Milton, Grade 5, Dayton Avenue Elementary School, c) Kimberly Cresser, Grade 4, Ridge Elementary School.