

# cleanup date

U.S. DEPARTMENT OF ENERGY/BROOKHAVEN NATIONAL LABORATORY/ASSOCIATED UNIVERSITIES, INC.

THE OFFICE OF ENVIRONMENTAL RESTORATION — VOL.3/NO.1/JANUARY 1998

## *New contractor, new challenges*

*From Bob Howe, Interim Manager,  
Office of Environmental Restoration*

The months ahead will be very challenging at Brookhaven National Laboratory (BNL) as we enter a transition period in which operation of the Lab is transferred to Brookhaven Science Associates (BSA).

While a management change and its associated expectations can be a time of uncertainty for any organization to go through, we at the Office of Environmental Restoration are eagerly looking forward to working as a team with BSA.

Our remediation program under Superfund will go on as scheduled and our commitment to the cleanup and the community will be as strong as ever. Our determination to do everything possible to protect public health and the environment will become even more apparent as additional programs are implemented to continue the cleanup at the Lab.

We believe that the new contractors from BSA are as committed as we are to these goals and we are confident that our program will be strengthened through our association with them. We are certain that working with them as a team will enhance efforts to clean up on- and off-site contamination in 1998 and beyond. ■



**Last landfill capped**

*The Lab's interim landfill (used in 1966) was capped in a project completed in October 1997. The cap, which is made up of layers of soil, clay, geotextile fabric and an impermeable plastic liner, prevents precipitation from reaching the landfill's contents. This landfill was the last of the three site landfills to be capped in the past two years.*

## Dual cleanup begins at Lab's steam facility

Brookhaven National Laboratory's fourth cleanup system is now operational. The system is removing contamination from soils and groundwater in the central portion of the Lab's 5,300-acre site.

The cleanup system, which began operating in November, combines two innovative technologies, known as air sparging and soil vapor extraction, to remove chemical compounds from the soil and groundwater.

Forty-eight air sparging wells (pipes that reach 80 feet below the ground) force pressurized air into the groundwater. The resulting air bubbles trap the compounds and carry them upward. Then 23 soil

vapor extraction wells (pipes that reach 30 feet below ground and are connected to powerful vacuum blowers) recover the resulting vapors and pipe them to a treatment facility. Carbon filters remove the contamination from the air before it is released.

The source of the contamination was a 1977 spill of approximately 25,000 gallons of fuel oil

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### inside

Innovative cleanup planned  
**see page 3**

Advisory board considered  
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## ***Spent fuel pool pumping done at High Flux Beam Reactor***

On January 7, Brookhaven National Laboratory (BNL) finished pumping water out of the spent fuel pool of the High Flux Beam Reactor (HFBR). This action will stop the tritium leak from the pool and is a major milestone in addressing tritium contamination in groundwater on the BNL property.

Between December 18 and January 7 approximately 65,000 gallons of water were pumped from the spent fuel pool and transferred via a double-walled underground pipe to double-walled storage tanks on the BNL property. The Suffolk County Department of Health Services (SCDHS) inspected the piping and the tanks, as well as a leak detection system for the tanks and transfer piping. In addition, the tanks were pressure-tested and certified by Underwriters Laboratory.

Last January, monitoring wells immediately south of the HFBR showed tritium in the groundwater at concentrations above the federal drinking water standard. BNL subsequently determined that tritiated water was leaking at a rate of six to nine gallons a day from the spent fuel pool located in the basement of the HFBR building. When the leak was discovered, the HFBR was already shut down for routine maintenance. The reactor has remained shut down.

After installing over 180 monitoring wells and analyzing over 1,800 samples in cooperation with the U.S. Environmental Protection Agency (EPA) and SCDHS, the Lab's Office of Environmental Restoration was able to define the contamination, which is confined to the Lab property. Both EPA and the County have stated that the tritium poses no danger to BNL employees or the public.

In May, groundwater pumping was begun to prevent further spread of contamination above the drinking water standard. Between May and September, BNL removed spent fuel elements from the spent fuel pool and shipped them off-site, in preparation for pumping water out of the pool.

The final remediation of the tritium plume will be addressed as part of the Operable Unit III study, which is

currently underway. The Operable Unit III decision process will include several opportunities for the public to review and comment on the remediation plans. These activities will include a public meeting and document comment periods. ■

## ***BGRR water pumping begins***

In early December, Brookhaven National Laboratory (BNL) began pumping radiologically contaminated water out of two air ducts at the Lab's former graphite reactor, which operated from 1950 to 1968.

On September 15, as part of an ongoing investigation of the Brookhaven Graphite Research Reactor (BGRR) complex, BNL inspected a sump and below-ground exhaust air ducts that were used to cool the reactor when it was operating. Subsequently, the Lab determined that the air ducts contained approximately 60,000 gallons of water, and sampling and analyses indicated that the water is radiologically contaminated.

The water is being pumped into tanker trucks, which transport it to larger holding tanks located at the Lab's newly opened, state-of-the-art Waste Management Facility. The water will be stored in the tanks temporarily until off-site disposal can be arranged. Pumping is expected to be completed in March.

Past leakage from cooling coils is the most likely source of water in the air ducts. Clean water apparently leaked from the coils, which are no longer used, and picked up existing contamination within the ducts. In early November, the Lab began additional groundwater monitoring to see if the ducts have leaked. Results of this sampling are expected in the near future. ■

## ***CR chief moves to DOE spot***

After two-and-a-half years with the Office of Environmental Restoration, lead community relations coordinator John Carter has taken a new position with the U.S. Department of Energy's Brookhaven Group (BHG). Carter is now serving as community and government relations manager for BHG. All of us at OER wish John the best of luck in his new position. ■

### **cleanupupdate**

A bi-monthly newsletter from the Office of Environmental Restoration ([www.oer.dir.bnl.gov](http://www.oer.dir.bnl.gov)) at Brookhaven National Laboratory, *cleanupupdate* is part of an on-going effort to inform people about environmental restoration issues and activities at the Lab. If you would like to be on the Office of Environmental Restoration mailing list, or if you have any questions about the cleanup, please contact:

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516-344-5588 ([howe@bnl.gov](mailto:howe@bnl.gov))

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# BNL receives \$1.5 million DOE grant for innovative cleanup technology

Brookhaven National Laboratory's Office of Environmental Restoration (OER) has received a \$1.5 million grant from the U.S. Department of Energy (DOE) to help finance the construction of an innovative groundwater treatment system.

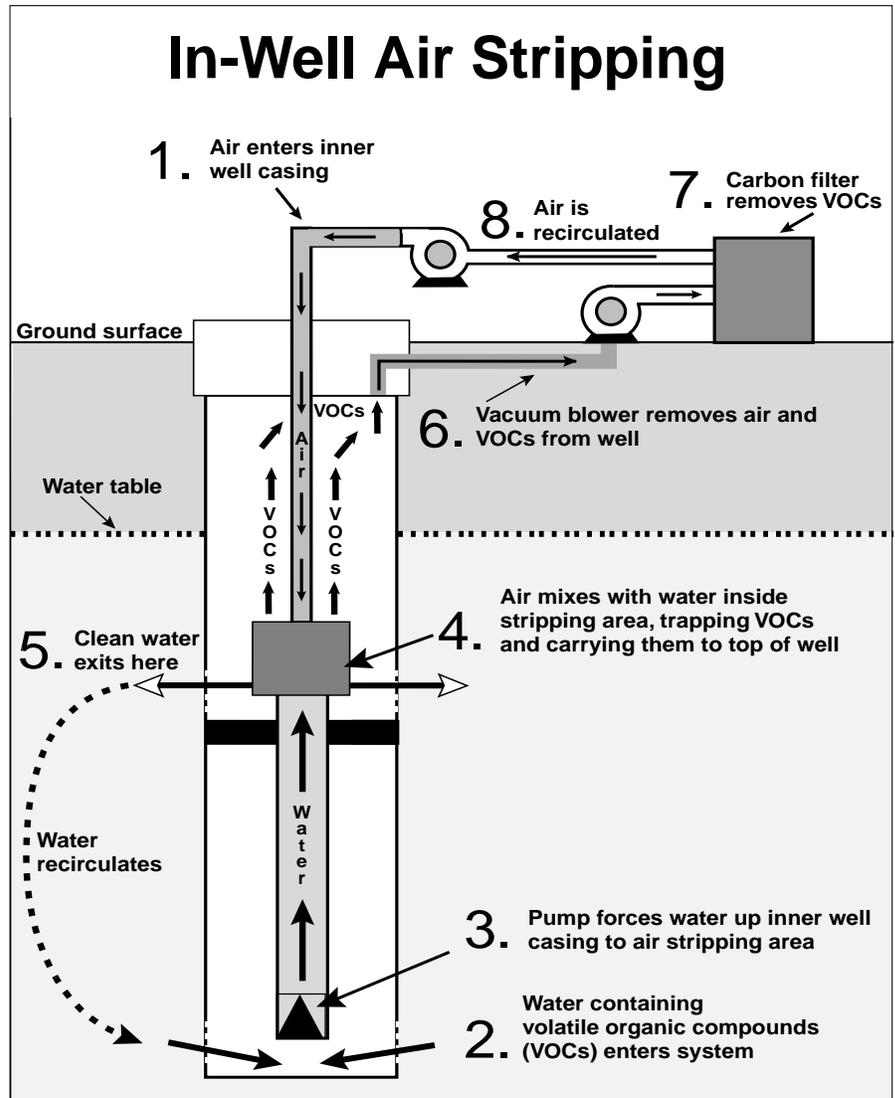
The "Technology Deployment Initiative" program was established in 1997 by DOE's Environmental Management division to promote the use of new and innovative technologies in site cleanups across the United States. Last November, OER submitted a proposal to use the funding to construct a cutting-edge groundwater treatment system.

The system, which would be located in the industrial park just south of the Lab and the Long Island Expressway, would address portions of a chemical groundwater plume extending beyond the Lab's southern boundary. In December, OER learned the proposal had been approved, and a portion of the grant money has already been made available.

## In-Well Air Stripping

This innovative technology employs in-well air stripping, which works by mixing air with contaminated groundwater. The mixing process "strips" or removes volatile organic compounds (i.e., solvents like carbon tetrachloride) from the water. The clean water exits the well and recirculates (see diagram), and the air carries the volatile organic compounds, now in gaseous form, upward within the well to the surface. The air is then vented from the well and sent through a carbon filter to remove the contaminants. The clean air is then forced back into the well under pressure and the cycle repeats. This closed-loop system prevents any air emissions, and the contaminated water is treated within the well without ever reaching the surface.

In-well air stripping was shown to be effective in removing contamination during a 1996 pilot study at the Lab. Similar systems have proven successful at several sites across the country, including the Savannah River Site in South Carolina, the Edwards Air



Force Base in California, and the Massachusetts Military Reservation.

## Off-site plume is focus

The portion of the groundwater plume that is the focus of this cleanup action extends from the central, developed portion of Brookhaven National Laboratory (BNL) into an industrial park just south of the Lab's southern boundary. The off-site portion of this plume is comprised primarily of carbon tetrachloride, a solvent once widely used at the Lab and in industry for degreasing equipment. The solvent, which was once commonly used as a dry cleaning chemical, has been detected in on- and off-site monitoring wells at depths of 180-300 feet below land surface. Concentrations as

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# Department of Energy seeks input on potential citizen advisory board

In November, the U.S. Department of Energy (DOE) hosted an interactive workshop to discuss the formation of an independent site-specific advisory board (SSAB) to advise DOE on specific environmental, safety and health issues, including environmental restoration activities, at the Brookhaven National Laboratory site.

The meeting, held on November 20 at the Lab's Brookhaven Center, brought together community members, members of existing advisory boards from DOE sites across the nation and other interested parties. The purpose of the workshop was to exchange information about board successes and problems as a first step towards deciding if an SSAB should be formed at BNL.

The workshop included the presentation of general information about functioning site-specific advisory boards at other DOE sites around the country and featured an evening panel discussion between community members and members of existing boards. Workshop participants included advisory board members from the Rocky Flats Environmental Technology Site in Colorado, the Nevada Test Site, the Savannah River Site in South Carolina, the Oak Ridge Reservation in Tennessee, the Fernald Site in Ohio and the Hanford Site in the state of Washington.

## Types of boards

These boards are structured groups that have been formed under the guidelines of the 1972 Federal Advisory Committee Act (FACA). FACA provides standards that govern the establishment,



*Reed Hodgin, facilitator for the Rocky Flats, Colorado Site-Specific Advisory Board, addresses an audience member's question during the evening session of the November 20 meeting.*

operation, administration, and duration of advisory committees and stresses that such boards exist to advise and recommend, not decide. According to FACA, the purpose of the board must be clearly defined, its membership must be balanced, and its recommendations should be the result of its members' independent judgment.

FACA is just one of several ways to form an oversight board. Some groups, believing the constraints of FACA pose a barrier to meaningful discussion and input, have formed boards that are run under a charter drafted and agreed upon by all members. Also, even if a FACA board is established at a site, it does not preclude other groups from forming non-FACA oversight boards.

## Roles and responsibilities

Site-specific advisory boards are but one method to increase public participation in decision making at

a DOE site. They do not, and are not intended to, replace existing or future public participation activities. Although the role of such a board varies at different sites, the basic responsibilities are similar for most of these boards. These responsibilities include:

- Providing policy information, advice and recommendations concerning environmental restoration, waste management and technology development to the assistant secretary of DOE's Environmental Management program, the director of DOE's Office of Intergovernmental and Public Accountability, and DOE field site managers.
- Providing input and recommendations on strategic decisions that impact future use of the site, risk management, economic development and budget prioritization activities.
- Providing site-specific input and recommendations.

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## Advisory board...

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### Membership key to success

According to the DOE's *SSAB Final Guidance* document, the member selection process is crucial to any board's success, and the formation process should provide an opportunity to include representation of all interested parties. Board membership (usually 10 to 20 members) should reflect the diversity of views in affected communities and regions, and include members representing local governments, environmental and civic groups, labor unions, site employees and any other interested parties. Ex-officio (non-voting) members may include representatives from DOE, the U.S. Environmental Protection Agency (EPA), and state and local governments. All meetings are open, and the public is encouraged to attend.

Members, who are not paid for their participation, must be willing to dedicate a significant amount of time to the board, as meeting attendance is just one requirement. Members are expected to:

- Participate in an open and constructive manner.
- Provide advice and comment on environmental management issues to the decision makers.
- Represent and communicate community interests and concerns.
- Act as a conduit for the exchange of information among the community, DOE and environmental oversight agencies regarding the environmental management program at the facility.
- Review, evaluate and comment on documents and other materials related to environmental management at the facility.

Members may also receive training in team building; reaching a consensus; environmental regulations; roles and responsibilities of DOE, its laboratories, EPA, and state regulators; and the history of environmental contamination at the specific site.

### Lead agency must contribute as well

Although a significant time contribution on the part of the members is required, DOE must also do its part. DOE must be willing to participate in a open and constructive manner, commit to financial support for the group, and ensure that the board has the opportunity to offer advice in the environmental management decision-making process.

While much information was shared during the November meeting, this workshop was intended to be a starting point for any interested parties. Over the next few weeks and months, DOE will continue to distribute information about SSABs to the community and other interested parties and gather feedback. After that feedback is collected and reviewed, a decision will be made whether such a board is right for both the Lab and the community as a whole.

For more information, contact John Carter, U.S. Department of Energy-Brookhaven Group, at 344-5195. ■

## contacts

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## Grant awarded...

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high as 5,100 parts per billion (ppb) have been detected. The U.S. Environmental Protection Agency and New York State drinking water standard for carbon tetrachloride is 5 ppb. A pump-and-treat system, constructed in 1997, is currently cleaning up the on-site portion of the plume and preventing further off-site migration.

### Hookups offered

Although a 1995 residential well sampling program in this area showed no contamination from BNL above

drinking water standards, DOE has offered area home and business owners free connections to the public water supply as a precautionary measure.

Construction of the \$3 million groundwater treatment system is expected to begin this summer. Currently, six wells are planned, each capable of treating 100 gallons of water per minute. Additional in-well air stripping systems are being considered for other areas of groundwater contamination at the Laboratory.

For more information, see the *Operable Unit III Pre-Design Report*, expected to be available for review in April 1998 at the Lab's four information repositories (for locations, see page 7). ■

# Sampling underway in Manorville area

Although the *Operable Unit VI Record of Decision* (ROD) has not yet received final approval from regulators, Brookhaven National Laboratory's (BNL) Office of Environmental Restoration (OER) has begun a groundwater monitoring and characterization program to obtain additional information about an off-site pesticide plume.

As part of this effort, OER has been working to obtain access to undeveloped property in the area so new monitoring wells can be installed to monitor the plume, which contains low concentrations of the pesticide ethylene dibromide (EDB). After these new wells are installed and sampling has been conducted, OER will study the data to verify modeling predictions of the migration of the EDB plume and to evaluate plume concentrations.

EDB is a chemical that was once commonly used as an agricultural pesticide and leaded gasoline additive. It was used at BNL during the 1960s and 1970s to sterilize the soil before conducting agricultural experiments in the Biology Fields, which are located in the southeastern area of the Lab. EDB has been detected in groundwater in an undeveloped area of Manorville, just south of the Lab's southern boundary, at concentrations as high as 3.5 parts per billion (ppb). The New York State drinking water standard for EDB is 0.05 ppb.

As outlined during the November 1996 public meeting, monitoring of existing wells has been conducted on a semi-annual basis, starting in May 1997. The second round of sampling was conducted in November 1997. Analytical results from the May sampling round indicate that the plume pattern has remained the same. The plume is still moving in a southerly direction, and natural attenuation is continuing to occur. This means that the EDB concentrations are less than they had previously been. EDB concentrations in several on-site wells are below detectable limits.

## Record of Decision revised

The ROD for the EDB plume was prepared by OER and submitted to regulators for an initial review in February 1997. OER currently is revising the ROD and will re-submit it to regulators in January 1998. A ROD is a major step in the Superfund process. It signifies that all characterization and evaluation of remedial action alternatives have been completed. The ROD also indicates that all three agencies (U.S. Department of Energy [DOE], U.S. Environmental Protection Agency, and N.Y. State Department of Environmental Conservation) have agreed on a remediation strategy. A series of poster sessions, a public meeting and a public comment period were held in the fall of 1996 to provide the community with information and obtain input on the remediation alternatives.

## hookupdate

*An update from the U.S. Department of Energy*

The Suffolk County Water Authority is nearing the end of the U.S. Department of Energy's public water hookup project.

Contractors have completed all water main installations in the Manorville area, and every property owner that applied for a hookup has been connected to the main. However, between 120 and 160 property owners who are eligible for a free hookup have not yet submitted an application to the water authority. Anyone who is eligible, but has not yet applied, should contact the Suffolk County Water Authority as soon as possible to obtain an application.

Restoration of landscaping and roads in the area is expected to be completed this spring. Once this work is completed, DOE will consider the project to be finished and there will be little, if any, opportunity for DOE to provide additional hookups. DOE, the Suffolk County Department of Health Services, and the Agency for Toxic Substances and Disease Registry have recommended that residents in these areas accept DOE's hookup offer to prevent the possibility of any potential future exposure to contaminated groundwater. ■

The remediation strategy for the EDB plume outlined in the ROD includes offering public water hookup for all residences and businesses in the vicinity of the predicted migration of the EDB plume, allowing the EDB to attenuate naturally, and implementing a groundwater monitoring program. Additionally, the ROD provides for a re-evaluation of the public hookup boundary if groundwater monitoring data indicate that new areas of the aquifer are impacted by EDB. Some of the remedial actions specified in the ROD (hookups, some groundwater monitoring) have already been implemented.

## Hookups offered

Even though the EDB from the Lab had not impacted residential wells, the DOE authorized the Suffolk County Water Authority to connect homes in Manorville to the public water supply in the summer of 1996. Initially, approximately 100 homes were hooked up to public water based on the known direction of groundwater flow, the depth of the contamination, and the EDB concentrations detected. In response to the concerns of citizens and elected officials, DOE agreed to offer public water hookups to 500 additional home and business owners last March. ■



*A backhoe removes soil and debris from one of the waste pits this past summer. During the excavation phase of the project, completed in August, more than 12,000 cubic yards of soil and debris were removed from the 55 waste pits. Once excavated, the soil and debris were sorted, placed on plastic liners (visible in the background at top of photo), and covered until permanent off-site disposal could be arranged. The final shipments of sorted waste are expected to be completed in 1999.*

# Waste pit excavation completed

Having successfully and safely completed the excavation of 55 former waste pits at Brookhaven National Laboratory, the Office of Environmental Restoration (OER) is taking final steps to sort and process the remaining wastes.

Biological waste, consisting of animal carcasses and bones excavated from the Chemical/Animal Pits, has been packaged in sealed containers and will be shipped off-site for incineration. Some of the excavated soils are also ready to be shipped off-site to a permitted waste disposal facility.

The Chemical/Animal Pits and Glass Holes Removal Action was conducted under the Lab's Superfund program after the contents of the pits were identified as a source of contamination to area soils and groundwater. The Chemical/Animal Pits were used for the disposal of chemical containers, glassware, and animal carcasses from the late 1950s to 1966. The Glass Holes were used

for the disposal of laboratory glassware and chemical containers from 1966 to 1981.

The unlined pits varied in size from 10 to 20 feet wide and from 12 to 30 feet deep. The pits were found to contain bottles, cylinders, and other containers, some filled with various laboratory chemicals.

OER and its contractors have now begun final work on the removal action for the former waste pits. The removal action has involved excavating more than 12,000 cubic yards of contaminated soil, buried waste and debris. The soil in the pits was excavated to a depth where sampling showed that New York State cleanup goals were met. Excavated material was taken to a processing area, where intact bottles and other containers were separated from the debris and soil. The soil and segregated wastes were then placed on plastic liners and covered. This part of the removal action was completed in August.

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## ***Libraries — All reports from BNL's Office of Environmental Restoration are available at:***

Longwood Public Library  
800 Middle Country Road  
Middle Island NY 11953  
516-924-6400  
e-mail:  
helpdesk@suffolk.lib.ny.us

Mastics-Moriches-Shirley  
Community Library  
301 William Floyd Parkway  
Shirley NY 11967  
516-399-1511  
www.li.net/~mmscl

BNL Research Library  
Building 477A  
Brookhaven Avenue  
Upton NY 11973  
516-344-3483  
http://www.bnl.gov

U.S. EPA Region II Library  
Administrative Records Room  
290 Broadway  
New York NY 10007-1866  
212-637-4296

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### *Dual cleanup...* (continued from page 1)

and mineral spirits. The contaminants were released when a line attached to a storage tank at the Lab's central steam plant ruptured. Soil in the area was excavated, but residual contamination remained.

The remaining soil and groundwater contamination includes breakdown products from the fuel oil and a common solvent, tetrachloroethene. The contamination is confined to the Laboratory site, and no public, private or Lab drinking water supply wells have been impacted by it.

The technologies for this treatment system were selected through a comprehensive evaluation of alternatives that were presented during a December 1995 public meeting. The system is expected to operate for at least two years. Three additional groundwater treatment systems are operating in other areas of the Lab.

*For more information, see the Operable Unit IV Remedial Design Specifications and Drawings report (indexed as a post-ROD document in the Administrative Record), available for review at the Lab's four information repositories (for locations, see page 7). ■*

### *Waste pits...* (continued from page 7)

Final characterization, management, and disposal of the excavated wastes and debris began in October. The remaining stockpiled waste will be stored on-site temporarily and will eventually be sent to permitted waste facilities for disposal. The former waste pits have been filled with clean soil and seeded. Site restoration will be completed after the wastes stored on-site are disposed. The remaining areas will then be seeded.

The U.S. Department of Energy, the U.S. Environmental Protection Agency, and the New York State Department of Environmental Conservation agreed that the remedial alternative that would be most protective of human health and the environment was excavation of the pit contents with off-site disposal. Excavation ensured that the source of contamination was removed, thereby eliminating the possibility of future soil and groundwater contamination. The final waste shipments are expected to be completed in 1999.

*For more information, see the Chemical/Animal Pits and Glass Holes Final Evaluation of Alternatives Report (indexed as BNL/RA6/8.5), available for review at the Lab's four information repositories (for locations, see below). ■*