

cleanupdate

U.S. DEPARTMENT OF ENERGY/BROOKHAVEN NATIONAL LABORATORY/BROOKHAVEN SCIENCE ASSOCIATES

ENVIRONMENTAL RESTORATION DIVISION — VOL.3/NO.4/DECEMBER 1998

Meeting scheduled on Lab soil cleanup

Early in 1999, Brookhaven National Laboratory (BNL) will ask the community for input on cleanup alternatives for contaminated soils at the lab site.

This public meeting will cover information from three documents relating to BNL soil contamination that are being released simultaneously for public review and comment. These documents are the *Operable Unit II/VII Remedial Investigation Report*, the *Feasibility Study Report-Operable Unit I and Radiologically Contaminated Soils*, and the *Operable Unit I Proposed Plan*. A 30-day public comment period will be held on these documents.

Operable Unit I

Operable Unit (OU) I covers areas in the southeastern portion of the BNL site, including the lab's former Hazardous Waste Management Facility (HWMF). In this area of BNL, the principal contaminants are cesium-137 and strontium-90. Low levels of other radionuclides and heavy metals (such as lead and mercury) have been found in a few locations.

The greatest area of concern is the former HWMF, where the highest levels of cesium-137 have been detected. This facility was used from 1947 - 1997 for processing, storing and shipping radioactive wastes, and from 1979 - 1997 for processing, storing and shipping hazardous wastes.

Radiological contamination has also been found at and near the Reclamation Facility, which was used to clean radioactive material from clothing and equipment.

An incinerator ash landfill contains contamination including both radioactive materials and heavy metals.

(continued on page 7)



Environment, Safety and Health Services coordinator Buzz Rundlett explains radiation basics to three Environmental Fair attendees. More than 3,600 people attended the September 18 fair, which focused on Brookhaven National Laboratory environmental programs and technologies. Fairgoers also participated in tours of remediation sites, a kite flying contest, and a recycling race. The Lab plans to hold a similar event next September.

Roundtables and workshops provide valuable input on groundwater cleanup options

Over the past few months, Brookhaven National Laboratory (BNL) has held several events to gather early input on groundwater cleanup options. Community members participated in a number of discussions to contribute their opinions and ideas. Their concerns have been presented to the agencies regulating the cleanup (the New York State Department of Environmental Conservation, the U.S. Environmental Protection Agency and the U.S. Department of Energy).

BNL employed three methods of obtaining public input: roundtable discussions, neighborhood canvassing and a community workshop. All have provided useful feedback to project managers, laboratory management and the U.S. Department of Energy.

Getting feedback

Four roundtable discussions were held in the fall of this year. These roundtables gave residents an early opportunity to get in

(continued on page 6)

Off-site construction underway

Construction began November 3 on the Lab's first off-site groundwater cleanup system. The system will be located in the industrial park south of the Lab and the Long Island Expressway and is expected to start operating next summer. When complete, the system's seven treatment wells will remove solvents from area groundwater.

An innovative technology known as in-well air stripping will be used in this project. In-well air stripping works by mixing air with contaminated groundwater within the treatment well itself. The mixing process "strips," or removes, volatile organic compounds (solvents like carbon tetrachloride) from the water. The clean water exits the well and recirculates. The air carries the volatile organic compounds, now in gaseous form, upward within the well to the surface. The air is then sent through a carbon filter to remove the contaminants. The clean air is recycled into the well 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.

This \$3 million project is being partially funded by a \$1.5 million Department of Energy Technology Deployment Initiative grant. The system is expected to operate for approximately seven to 10 years. ■

New staff to help with outreach

Two new employees have joined the community relations staff in the Environmental Restoration Division since the last issue of *cleanupdate*. They are:

- Kristin Kirk, Community Relations Coordinator

Kristin has a background in television and film production. She will be focusing on public interactions including site tours and responses to community questions. Kristin will also assist in preparing documents relating to the BNL site cleanup.

- Christine Lafon, Community Relations Coordinator

Christine is a recent arrival from Texas and has a background in physics and astronomy. She has also taught at Nassau Community College. Christine will be



New Environmental Restoration Community Relations Coordinators Kristin Kirk (left) and Christine Lafon.

writing articles for *cleanupdate* as well as drafting various other documents regarding the cleanup process. She will also manage the restoration division's web page (www.oer.dir.bnl.gov) and participate in public outreach initiatives. ■

Libraries and reports

All reports from BNL's Environmental Restoration Division are available at:

Longwood Public Library
800 Middle Country Road
Middle Island NY 11953
516-924-6400

Mastics-Moriches-Shirley
Community Library
301 William Floyd Parkway
Shirley NY 11967

BNL Research Library
Building 477A
Brookhaven Avenue
Upton NY 11973
516-344-3483

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

What's new in the libraries:

- *Operable Unit V Remedial Investigation/Risk Assessment Report* (Indexed as BNL/OU5/10.7/1-2633)

cleanupdate

A newsletter from the Environmental Restoration Division (www.oer.dir.bnl.gov) at Brookhaven National Laboratory, *cleanupdate* 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 Environmental Restoration Division mailing list, or if you have any questions about the cleanup, please contact:

John Meersman
Division Manager
516-344-8632 (meersman@bnl.gov)

Eloise Gmur or Christine Lafon
Community Relations
516-344-6336 (egmur@bnl.gov) or 344-8192 (clafon@bnl.gov)

Roundtables help focus Peconic River sampling plan

A series of five roundtable meetings held at the Lab in October gave more than 40 local residents, business leaders and government and environmental group representatives an opportunity to discuss and comment on a proposed sampling plan for Peconic River sediments. Later this winter, sediment samples will be collected from the river, and these will be analyzed to show whether earlier potential indications of plutonium in the sediment were correct. In addition, surface water will be collected, and previously collected fish will also be analyzed.

Roundtable participants included residents living along the river, representatives from environmental groups, local businesses, and special interest groups. Representatives from regulatory agencies also participated. Members of Brookhaven's new Community Advisory Council and Lab employees also took part in the roundtables.

The purpose of the roundtables was to give the broad community using the river an opportunity to provide early input on the sampling plan. Comments or suggestions made at the roundtables are being evaluated for inclusion in the final plan. The proposed plan will be reviewed and evaluated by the Suffolk County Department of Health Services, N.Y. State Department of Environmental Conservation, N.Y. State Department of Health, U.S. Environmental Protection Agency and U.S. Department of Energy.

Sediments targeted

Previous investigations of the river have documented the presence of contaminants including PCBs, DDD (a pesticide), cesium-137 and heavy metals like mercury and silver. This contamination can be traced to discontinued Lab disposal practices. For more information, see the *Operable Unit V Remedial Investigation/Risk Assessment Report*, available for review at the Lab's four information repositories (see page 2 for locations).

While cleanup plans based on these findings are already being prepared for Peconic River sediments, an additional round of sediment sampling carried out in the spring of 1998 potentially detected low levels of plutonium in one Peconic River sediment sample. The sampling program included samples taken from 10 on-site locations where sediments tend to accumulate, as well as one similar off-site area located about one mile downstream of the BNL boundary.

The analytical results from the May sampling were close to or below the detection limit (the analytical lab's threshold for determining whether a substance is

Sampling Plan Roundtable Invitees:

- Brentwood/Bay Shore Breast Cancer Coalition
- Group for the South Fork
- Standing for Truth About Radiation (STAR)
- Citizen's Campaign for the Environment
- Fish Unlimited
- SHAD Alliance
- Community Alliance for Lab Accountability (CALA)
- Peconic Sportsmans Club
- E. Yaphank Civic
- Manorville Civic
- Peconic Lake Estates Civic
- Calverton Hills Homeowners Association
- Wading River Civic
- Ridge Civic
- Peconic Paddler
- BNL Community Advisory Council
- Brookhaven Organization of Scientists
- Peconic Area Residents
- BNL Employees
- Brookhaven Retired Employee Association
- Friends of Brookhaven
- Peconic Baykeeper
- Brookhaven Town
- Riverhead Town
- Southampton Town
- NY State Department of Environmental Conservation
- Suffolk County Department of Health Services

actually present) and are considered inconclusive. Because of uncertainty in these measurements, additional sediment samples are needed. Under the proposed sampling plan, BNL will collect samples of river sediment and surface water from both on- and off-site locations. The samples, along with previously collected fish samples, will be sent to non-BNL laboratories for analysis, with control samples included to ensure analytical accuracy.

Dual purpose

The purpose of the additional sampling is twofold: to determine whether there is plutonium in Peconic River sediments at levels that could potentially endanger human health, and to compare the sampling results to the levels of plutonium found in other similar areas.

Under the proposed sampling plan, samples will be collected at the Lab's Sewage Treatment Plant and from on- and off-site sections of the Peconic River ranging from the plant to the Route 105 bridge in Riverhead, close to the mouth of Flanders Bay.

In addition, BNL is proposing to collect sediment samples from areas not associated with Lab operations to help determine what levels of plutonium are found in similar areas as a result of atmospheric weapons testing in the 1950s and 1960s (this is also known as "background" radiation). By comparing samples from similar locations in the Connetquot River to the Peconic samples, BNL may be able to determine if any plutonium found in the Peconic River can be traced to prior Lab operations.

(continued on page 8)

The progress of the Superfund cleanup at BNL is reviewed in *cleanupupdate* twice each year. These charts show the status as of December 1998. One chart is for "removal actions" (right) and the other for "operable units" (below).

The Lab's cleanup is organized into six administrative segments, each representing a geographic area of the Lab site. The soil and groundwater in the "operable units" are investigated to see if past Lab practices have left contamination with the potential to impact human health and/or the environment. If contamination is found, BNL's Environmental Restoration Division works with the federal, state and local officials, and the public, to determine the appropriate cleanup remedy.

A "removal action" occurs if contamination is found that could pose a threat to public health or the environment. The action is taken as quickly as possible to eliminate the potential threat. Five removal actions are complete and two are close to completion.

In the cleanup process, completion of a given step usually means the issuance of a major report. These reports are listed in quotation marks across the top section. Below are the actual or anticipated dates when regulators release these reports to the public. Future dates are scheduled in the "Schedules Document," which proposes the timetable for each operable unit and removal action.

These schedules, approved by the U.S. Department of Energy, the U.S. Environmental Protection Agency and the New York State Department of Environmental Conservation, are updated at least annually and may change based on the time needed to review and finalize draft reports. Also listed above the columns are the cleanup-related activities that do not result in major reports—sampling, analysis and evaluation of data and public participation—but play major roles in the cleanup process.

The completed reports listed here, as well as the Schedules Document, are available for public review as part of the "Administrative Record" of the BNL cleanup. Complete sets of the Administrative Record are available at the Lab's four information repositories. Document summaries, meeting schedules and other public participation information can be also be found at the ERD web site (www.oer.dir.bnl.gov).

The Superfund Process at BNL

REMOVAL ACTIONS ↓	Investigation/Study				Decision	Design	Cleanup	Closure	
	"Work Plan" "Health & Safety Plan" "Sampling & Analysis Plan"	Field investigation, sampling & analysis data	"Engineering Evaluation/ Cost Analysis"	Public participation, press releases, public notices, information meetings	"Action Memorandum" (Includes comments & responses in "Responsiveness Summary")	Design phase of Remedial Action	Begin actual cleanup	"Closeout Report"	
Removal Action I D Tanks	completed 7/91	Field work and evaluation	completed 7/93	On-going	completed 9/93	completed 8/94	8/94	12/95 <i>DONE</i>	
Removal Action II 12 Underground storage tanks	completed 7/94		N/A		completed 3/95	7/95	4/96 <i>DONE</i>		
Removal Action III Cesspools	completed 7/91		completed 2/94		completed 3/94	4/94	7/95	Spring 99*	
Removal Action IV Bldg. 479 PCB soil remediation	completed 1/92		N/A		N/A	5/92	3/93 Immediate removal action		
Removal Action V OU I Groundwater removal	completed 9/92		completed 12/95		completed 12/96	completed 5/96	5/96	5/96 Initiated public water hook-up 12/96 Initiated ground-water cleanup	12/96 <i>DONE</i>
Removal Action VI 1. Current landfill 2. Former landfill 3. Glass holes	completed 10/93		completed 4/95		Current & Former landfill closure	1. completed 12/94	completed 7/94	5/95	6/96 <i>DONE</i>
			completed 4/97		"Evaluation of Alternatives Report for Glass Holes"	2. completed 7/95	completed 8/95	5/96	3/97 <i>DONE</i>
		3. completed 5/97	completed 11/96	5/97	Spring 99*				
Removal Action VII Bldg. 464 Mercury soil remediation	completed 7/94	N/A	completed 2/95	N/A	7/94	2/95 Immediate removal action			

OPERABLE UNITS ↓	Investigation/Study				Decision	Design	Action					
	"Scope of Work"	"Remedial Investigation/ Feasibility Study/Work Plan" (Include "Sampling & Analysis Plan" "Health & Safety Plan")	Remedial Investigation (Field work)	"Remedial Investigation/ Risk Assessment Report"	Feasibility Study	"Feasibility Study Report" & "Proposed Plan"	Public participation, press releases, public notices, information meetings	Public meeting	Record of public comments & responses in "Responsiveness Summary" (Included in ROD)	"Record of Decision" (ROD)	Begin design phase of remedial action	Begin actual cleanup
Operable Unit I Hazardous Waste Management Facility and site-wide radiologically contaminated soils	completed 2/92	completed 10/93 ou I 7/94 ou VI	Field work and evaluation	completed 7/96	Alternative methods of cleanup examined	Winter 98/99*	On-going	Winter 98/99*	Winter 98/99*	Spring 99*	Fall 99*	Summer 00*
Operable Unit II Waste Concentration Facility, AGS Scrap yards, former Low-Mass Criticality Facility, contaminated landscape soils	completed 12/94	completed 1/96		Winter 98/99*		Evaluation of alternatives and cleanup transferred to OU I (To allow for a consolidated effort to clean up all site-wide radiologically contaminated soils.)						
Operable Unit III HFBR Tritium Potable/supply wells, spills, sewer pipes (in the central area)	completed 3/93	completed 10/94		Winter 98/99* Incorporates additional work on HFBR Tritium Plume		Winter/Spring 99*		Winter/Spring 99*	Spring/Summer 99*	Summer/Fall 99*	1999*	Summer 00* Interim groundwater cleanup operational 6/97 (Final remedy)
Operable Unit IV Central Steam Facility, Reclamation Facility	completed 9/90	completed 12/91		completed 11/94 completed 11/95 addendum		completed 11/95		completed 12/95	completed 3/96	completed 3/96	5/97	11/97 Interim soil cleanup completed 1994 <i>DONE</i>
Operable Unit V Contamination related to Sewage Treatment Plant	completed 8/92	completed 3/94		May 98 Incorporates additional sampling/study of Peconic River		Winter 98/99*		Winter 98/99*	Summer 99*	Summer 99*	Winter 00*	Spring 03* Imhoff tanks cleanup completed early 1996
Operable Unit VI Ethylene dibromide (EDB) groundwater contamination	included with OU I	Included with OU I		completed 10/96 "Focused" Feasibility Study		completed 11/96		Winter 98/99*	Winter 98/99*	Winter 98/99*	Winter 98/99*	8/96 Public water hookups completed <i>DONE</i>

* Anticipated dates

Early input... *(continued from page 1)*

formation on groundwater contamination and provide input to BNL and DOE on potential cleanup options. This input will be used in the selection of cleanup alternatives that will be further evaluated in a feasibility study.

Participants included key business stakeholders (such as representatives from Brookhaven Airport, where treatment systems may be located), people who expressed interest during canvassing and representatives of local civic organizations. This small-group format allowed more one-on-one interaction and was very successful.

Canvassing by phone and in person was also used to gather input. BNL representatives spoke with more than 150 residents south of the Lab by phone, and made follow-up visits to 48 homes whose residents expressed interest in the groundwater cleanup. Ten residents who were initially contacted during canvassing were among those who attended the roundtable discussions.

Additionally, an informational workshop was held on October 22nd to gather more input from community members. More than 30 people attended this workshop to learn more about the contamination and cleanup options.

Public input

Local residents expressed concern about a number of issues regarding the groundwater cleanup. One chief concern was the quality of the public water supply. People were concerned that BNL contamination may be affecting the public supply wells.

BNL representatives responded that none of the detected contaminant plumes are near a public supply well, and that the planned treatment systems will prevent contamination from reaching these wells. Also, County authorities regularly monitor water quality in the public supply wells, and BNL has groundwater monitoring wells placed to provide assurance that VOC plumes are not moving toward the public supply wells.

The public also raised questions about whether or not the sources of contamination have been eliminated. BNL has already completed several remediation actions including landfill capping, excavation of waste pits and draining of the High Flux Beam Reactor spent fuel pool (the source of a tritium plume in on-site groundwater). Three groundwater treatment systems are also in operation.

Many of those who provided input supported leaving the strontium and tritium contamination underground to decay naturally while monitoring it to ensure



Community resident Jerry Minasi (center) talks with Robert Howe, Environmental Restoration groundwater program manager (left) and project manager Teresa Baker (right) inside a groundwater treatment building similar to one being proposed for off-site use. Mr. Minasi was one of more than 50 area residents who participated in the roundtable discussions and community workshop.

that none moves off site. They indicated that removing the contaminants and transporting them off site was seen as a higher risk than leaving the strontium and tritium underground to decay below drinking water standards. Other participants felt that some form of in ground treatment would be advisable.

The majority of participants were also in favor of installing treatment systems to remove solvents, known as volatile organic compounds (VOCs), from the groundwater. However, there were concerns expressed about locating these systems in residential areas as well as the time frame for cleanup. As an alternative to locating wells in residential areas, some residents preferred placing systems in a non-populated area of North Street and at the Brookhaven Airport. Community members said they welcomed the opportunity to give input at this early stage, and expressed a desire to be kept informed as the decision-making process moves forward.

Next steps

The *Operable Unit III Remedial Investigation/Risk Assessment Report* is scheduled to be released to the public this winter. The next step will be to complete a Feasibility Study to closely examine several cleanup alternatives and evaluate them for effectiveness, feasibility and other factors such as community acceptance.

A cleanup alternative will then be proposed, and the public will be asked for input on this proposal during the public comment period. A public meeting focused on the cleanup alternatives will be held during the public comment period. After all comments are considered, a remediation action will be selected in a Record of Decision and implemented. ■

Soils cleanup... *(continued from page 1)*

The Meadow Marsh ponds and two storm recharge basins serve as breeding grounds for the endangered tiger salamander. Heavy metals and organic chemicals have been found at these locations.

Operable Unit II/VII

The areas covered by Operable Unit II/VII include the Waste Concentration Facility, which was used to store and process liquid radioactive waste, as well as several lawns and landscaping soils near BNL buildings. These areas were identified by aerial radiation surveys and later studied using soil sampling and analysis to search for any contamination.

The only soil contaminants found in these areas were radiological, mainly cesium-137. These contaminants were found in the top layer of soil, less than two feet below the surface. Soils deeper than two feet were not contaminated, except for one location where tritium and sodium-22 were found. No chemical contaminants were found in these areas.

The primary contamination in OU II/VII is found in the soils. Therefore, the soils of OU II/VII were incorporated into OU I to facilitate plans for cleanup.

Cleanup options

Several alternatives are being proposed to address the radiologically contaminated soils:

- Collecting contaminated soils in an on-site cell that would be lined and "capped" with layers of sand, soil and plastic to prevent future exposure. A long-term maintenance program would be required.
- Off-site disposal at a licensed waste management facility of more highly contaminated soils, with on-site containment of the remaining soils.
- Excavating all contaminated soils above cleanup levels for disposal at a licensed off-site waste management facility.

- Excavating and washing highly contaminated soils, on-site disposal of soils with lower contamination levels.
- Excavating and melting contaminated soils, creating a glass-like mass that traps contaminants.

Preferred options

The third alternative, excavation and off-site disposal of radiologically contaminated soils, is being recommended by the N.Y. State Department of Environmental Conservation, the U.S. Environmental Protection Agency and the U.S. Department of Energy. The agencies determined that this alternative would be most protective of human health and the environment because all radiologically contaminated soils above cleanup levels would be removed. Excavated soils would be disposed at a licensed off-site facility, so no on-site maintenance and inspection would be required.

Removal of contaminated soils and reconstruction of wetlands are proposed for the Meadow Marsh basins, a known breeding area for tiger salamanders. Continued monitoring is proposed for the storm recharge basins, which have lower levels of contamination.

Public comment is encouraged on all of the cleanup options discussed above. The final remedies chosen could be any one or a combination of the options, depending on public comments and any additional technical information. After community input is gathered, a final decision will be made by the regulatory agencies and the cleanup will begin.

Other areas of contamination, such as 55 former waste pits and all three on-site landfills, have already been addressed. The on-site landfills have been capped to keep out rainwater that could move contamination into the groundwater. The waste pits have been excavated to remove their contents. The materials removed have been sorted and are being disposed of off-site. ■

Remediation roundup

The Laboratory currently has three treatment systems operating 24 hours a day to clean up groundwater on the site. The following is an update on the total amounts of groundwater treated by each system and the amount of contaminants removed from the sole-source aquifer.

- **Removal Action V Pump-and-Treat System (operating since 12/96):**
 - 620,000,000 gallons of groundwater treated by air stripper and recharged
- **Operable Unit III Pump-and-Treat System (operating since 6/97):**
 - 450,000,000 gallons of groundwater treated by air stripper and recharged
- **Tritium Remediation System (operating since 5/97)**
 - 90,000,000 gallons of water treated by carbon filters (to remove VOCs) and recharged
 - Further southward movement of High Flux Beam Reactor tritium plume curtailed

To date, more than one billion gallons of groundwater have been treated, and more than 750 pounds of contaminants have been removed from the sole source aquifer.

cleanupdate

Brookhaven National Laboratory
Environmental Restoration Division
Building 51
Upton NY 11973

PRINTED ON RECYCLED PAPER



What would you like to read in **cleanupdate** ?

cleanupdate's purpose is to provide you with information about Superfund cleanup activities at Brookhaven National Laboratory, and we'd like to know whether the newsletter is meeting your information needs. Drop us a line at: *cleanupdate*, Brookhaven National Laboratory, Environmental Restoration Division, Bldg. 51, Upton, NY 11973 (web address: <http://www.oer.dir.bnl.gov>).

River sampling...

(continued from page 3)

Feedback from participants

In general, roundtable participants said they were pleased with the sessions and found them worthwhile. Concerns expressed included:

- Locations and depths to be sampled (several participants had particular areas they would like to see sampled).

- The need for accurate measurements of "background" plutonium levels.

- A suggestion that samples should be taken in areas that might have once held water but as a result of changes in the river flow are now dry.

After all feedback is considered, BNL and DOE will follow up by providing roundtable participants with responses to comments (including how each was addressed in the plan), as well as locations where the final sampling plan can be viewed. ■