

FINAL

ACTION MEMORANDUM

PECONIC RIVER  
REMOVAL ACTION FOR SEDIMENT OUTSIDE  
BNL PROPERTY

September 8, 2004

Prepared by:  
Brookhaven National Laboratory  
Brookhaven Science Associates  
Under Contract No. DE-AC0-2-98CH01886 with the  
United States Department of Energy

Prepared for:  
U.S. Department of Energy  
Brookhaven Area Office  
Upton, New York 11973

## TABLE OF CONTENTS

ACRONYMS, ABBREVIATIONS, AND UNITS OF MEASURE.....	ii
LIST OF FIGURES.....	ii
I. PURPOSE.....	1
II. SITE CONDITIONS AND BACKGROUND .....	2
A. Site Description.....	2
B. Actions to Date .....	6
C. National Priorities List Status .....	7
III. THREATS TO PUBLIC HEALTH OR WELFARE AND THE ENVIRONMENT STATUTORY AND REGULATORY AUTHORITIES.....	7
A. Threats to Public Health or Welfare and the Environment .....	7
IV. IDENTIFICATION OF REMOVAL ACTION OBJECTIVES .....	7
V. PROPOSED ACTION.....	8
A. Proposed Action .....	8
B. Contribution to the Remedial Performance.....	8
C. Description of Alternative Technologies.....	8
D. Applicable or Relevant and Appropriate Requirements .....	9
E. Project Schedule .....	9
VI. EXPECTED CHANGE IN THE SITUATION SHOULD ACTION BE DELAYED OR NOT TAKEN.....	10
VII. PUBLIC PARTICIPATION .....	10
VIII. OUTSTANDING POLICY ISSUES .....	10
IX. RECOMMENDATION.....	10
X. REFERENCES .....	11

## ACRONYMS, ABBREVIATIONS, AND UNITS OF MEASURE

ARAR	Applicable or Relevant and Appropriate Requirement
BNL	Brookhaven National Laboratory
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFR	Code of Federal Regulations
DOE	U.S. Department of Energy
EPA	U.S. Environmental Protection Agency
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
PCB	polychlorinated biphenyl
ppm	parts per million
STP	Sewage Treatment Plant
SCDHS	Suffolk County Department of Health Services
TBC	to be considered

## LIST OF FIGURES

Figure 1. The Peconic River with Cleanup Area Insets.....	3
Figure 2. Location of the Peconic River Removal Areas D, E, and P.....	4
Figure 3. Location of Peconic River Removal Areas: Manor Road.....	5

## **I. PURPOSE**

The purpose of this Action Memorandum is to document the decision by the U.S. Department of Energy (DOE) to remove contaminated sediments from the portion of the Peconic River outside the Brookhaven National Laboratory (BNL) property.

The DOE has determined that the removal of contaminated Peconic River sediments outside of BNL property is necessary to protect human health and the environment. Pursuant to this determination, the DOE developed a Proposed Remedial Action Plan (Proposed Plan) for the cleanup of the River that summarized the evaluation of four remedial alternatives. The public comment period for this Proposed Plan was concluded on June 25, 2004. As further explained below, the DOE addressed the few comments that were received, and a draft Record of Decision including a responsiveness summary was submitted for review by the Interagency Agreement (IAG) regulators.

Based on the public comments received and subsequent discussions with the U.S. Environmental Protection Agency (EPA), New York State Department of Environmental Conservation (NYSDEC), New York State Department of Health (NYSDOH), and Suffolk County Department of Health Services (SCDHS), two principal changes were made to the Peconic River wetland restoration process and reflected in the draft Record of Decision:

1. To the maximum extent possible, BNL will not bring in topsoil to replace removed sediment. To re-establish the low marsh, BNL will remove riverbed material from the designated open water areas following confirmation sampling.
2. To the maximum extent practicable, wetland plants used to restore sections of the Peconic River within Suffolk County parklands will be obtained from within the Peconic River

Given the considerable regulatory and community support of DOE's proposed Alternative 4, the DOE has decided to expedite the cleanup of those portions of the Peconic River outside of BNL property exercising its removal action authority. Accordingly, the decision to proceed with the implementation of Alternative 4 is being documented in an action memorandum. In addition to precluding further downstream migration (of contaminants), expediting this response action will allow DOE to take advantage of the extremely favorable seasonal conditions for sediment removal (and wetland restoration) during late summer and early fall.

## **II. SITE CONDITIONS AND BACKGROUND**

### **A. Site Description**

#### **1. Physical Location**

BNL is owned by the DOE and is located in the Town of Brookhaven in Suffolk County, New York. The Laboratory carries out basic and applied research in the fields of high-energy nuclear and solid-state physics, fundamental material and structure properties and the interaction of matter, nuclear medicine, biomedical and environmental sciences, and selected energy technologies.

BNL contains 5,265 acres of which 75 percent is wooded. The remainder is developed and includes office buildings, research facilities, residential areas, and parking lots. BNL is located near the western boundary of the Manorville drainage basin. The principal drainage feature of the Manorville drainage basin is the Peconic River (Figure 1), which is a coastal plain stream. BNL forms part of the upper drainage area or headwaters of the Peconic River. The surface drainage is poor in the Manorville drainage basin, and accounts for much of the land near the river being swampy. East of the Manorville drainage basin, the Peconic River valley widens and forms the Riverhead basin. The Peconic River drains in an easterly direction and then flows into Flanders Bay, an arm of the Great Peconic Bay. The western branch of the Peconic River enters BNL in the northwest section. The Sewage Treatment Plant (STP) outfall marks the start of constant flow and the river exits the property to the southeast near North Street. (The northern branch joins the river outside BNL property, approximately 0.5 miles upstream of Schultz Road). The cleanup areas identified in this Action Memorandum extend approximately 5 miles downstream of BNL property.

#### **2. Removal Site Evaluation**

Past operations and practices at BNL resulted in the discharge of wastewater containing chemical and radiological contaminants to the STP, and then to the Peconic River causing contamination of sediments and fish in the river.

Outside BNL property, the Peconic River contains three major depositional wetland areas: Area D, Area E, and Area P. The cleanup in Areas E and P include areas that were identified as preferential producers of methylmercury. Also, the overall cleanup area includes three areas in the vicinity of Manor Road where elevated levels of mercury were identified. The locations of the removal areas in the Peconic River outside BNL property are shown in the two insets in Figure 1. Figures 2 and 3 show detailed views of the removal area shown in the insets.

Figure 1. The Peconic River with insets for cleanup areas outside BNL property.  
 (Figures 2 and 3 show detailed views of the cleanup areas.)

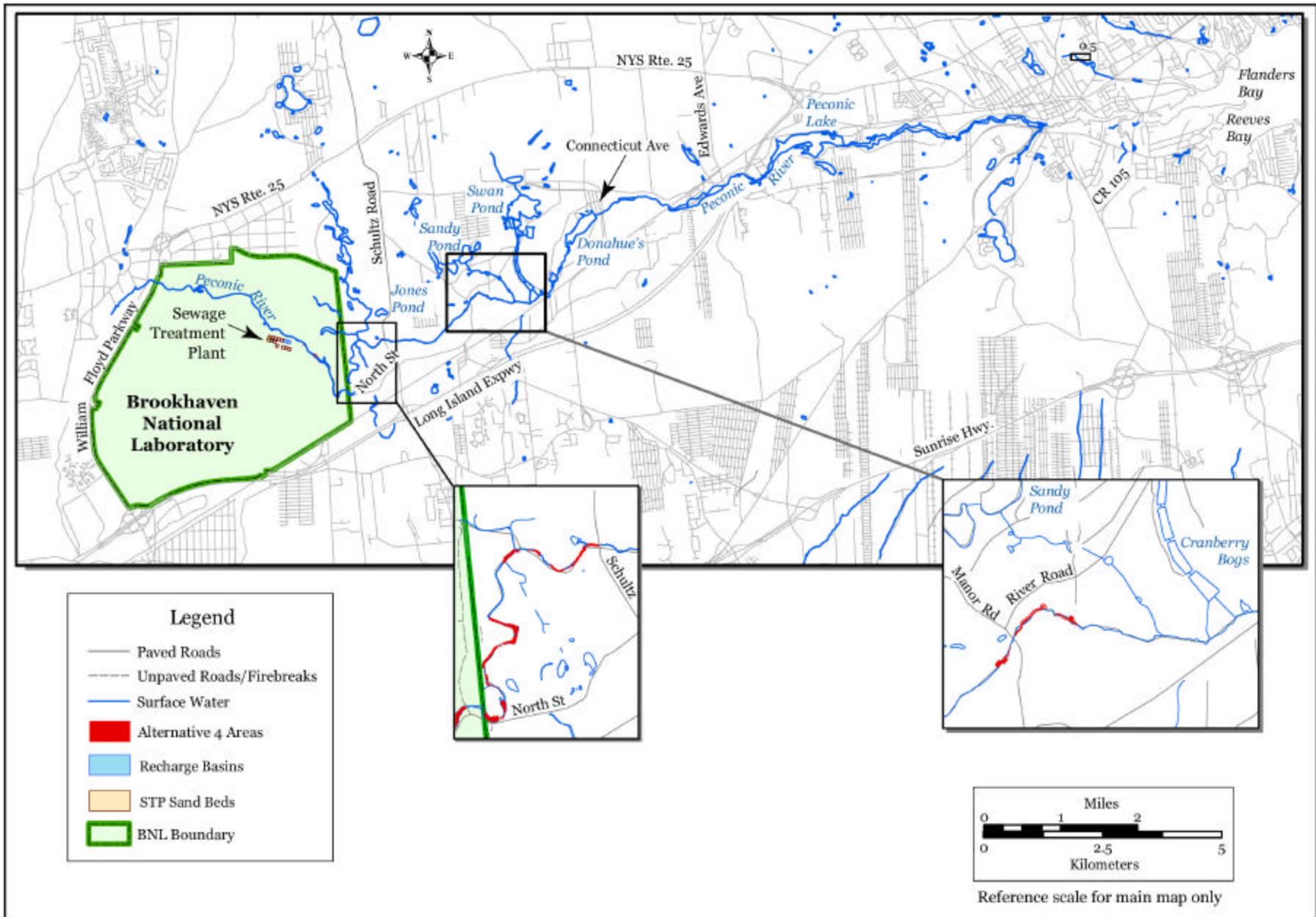
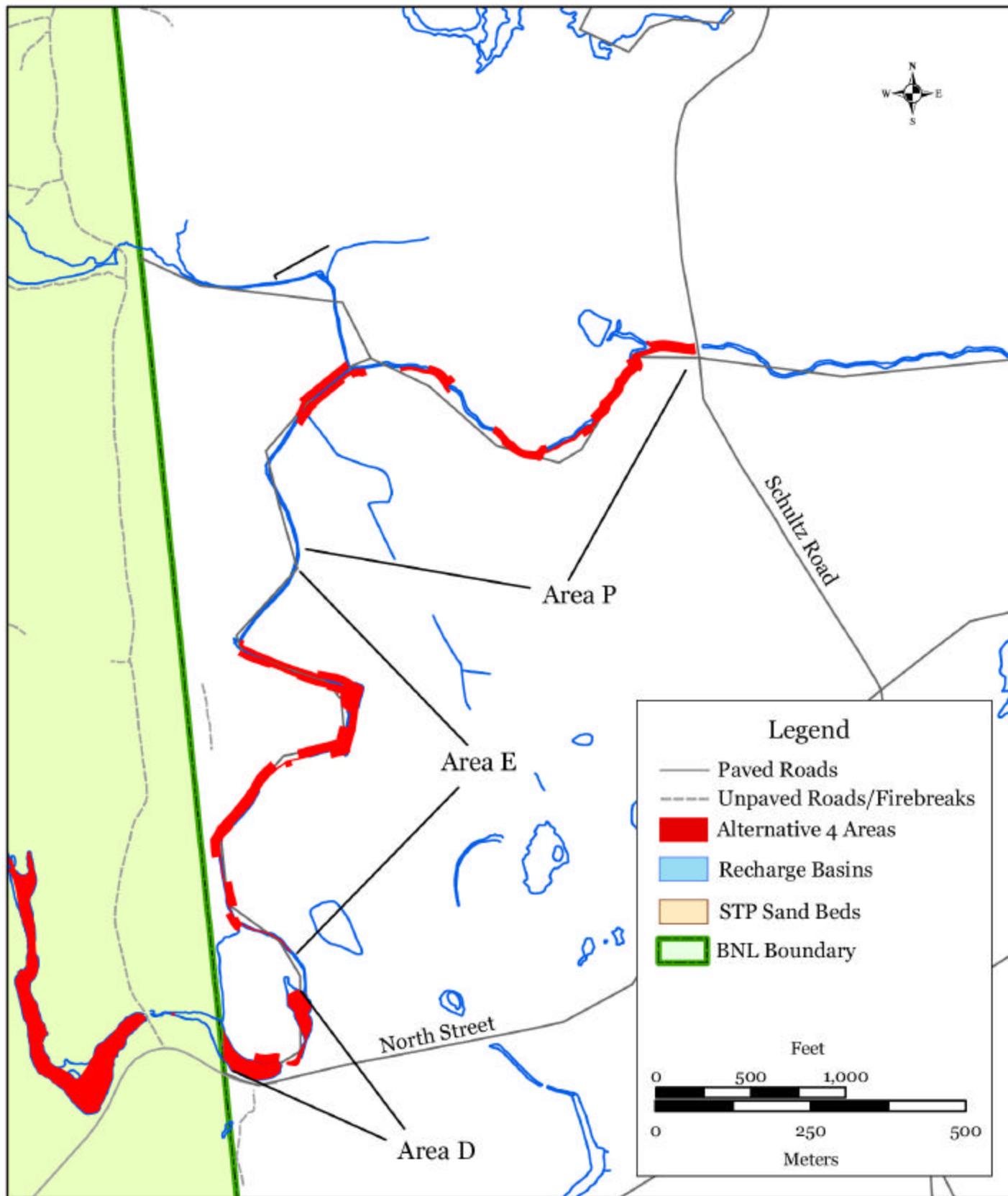
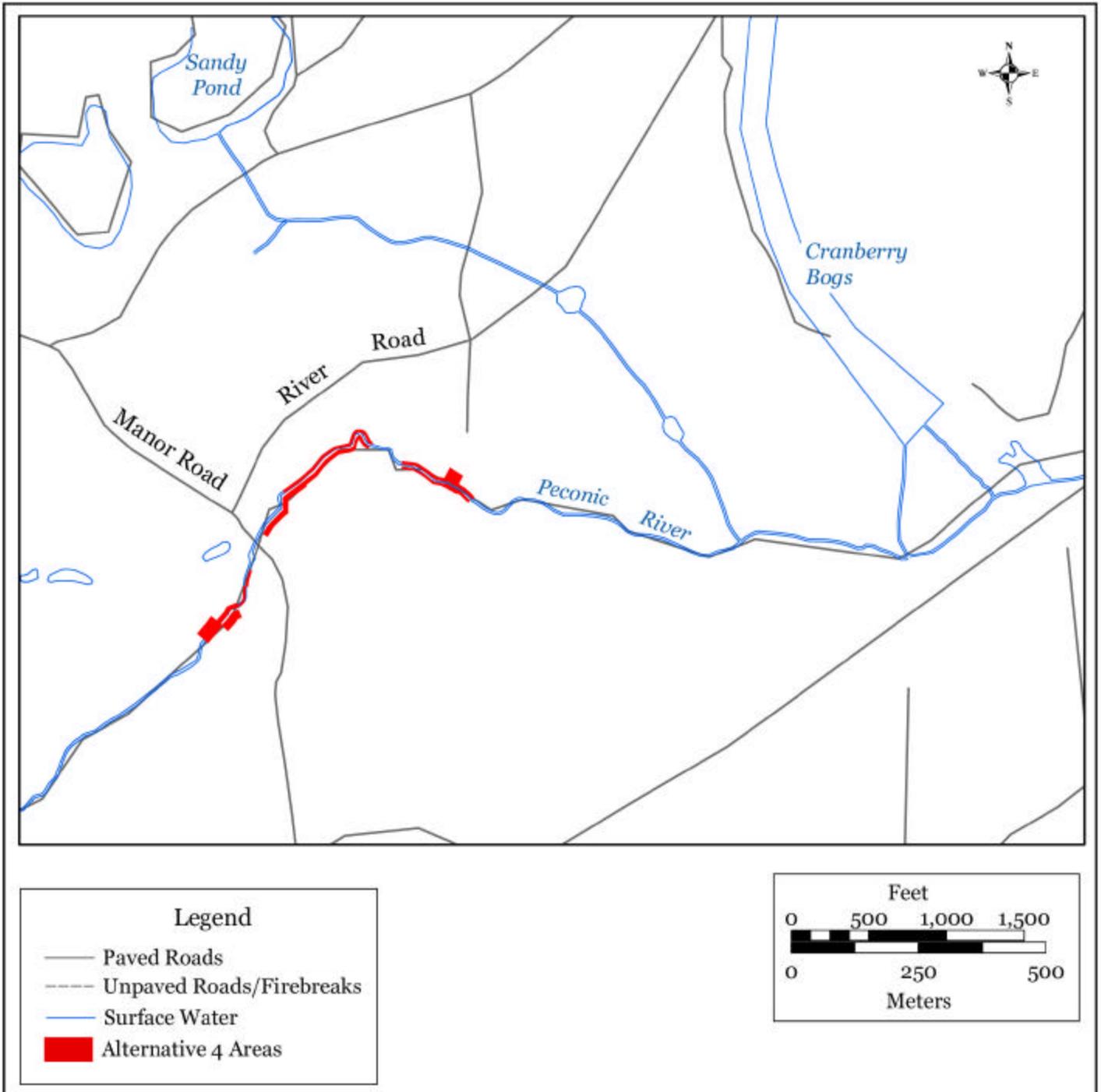


Figure 2. Locations of the removal areas D, E and P outside BNL property.



**Figure 3. Location of Peconic River Removal Areas: Manor Road**



The contaminant of greatest concern is mercury, with a maximum concentration in sediment of 39.7 parts per million (ppm), because this contaminant has been shown to bioaccumulate in fish. Radiological contaminants are below levels requiring cleanup, but are largely co-located with the mercury. Contaminants co-located with the mercury will also be removed. Contamination is highest in surface sediment and is most prominent in the depositional areas.

## **B. Actions to Date**

### **1. Previous Actions**

BNL has taken numerous actions to reduce the discharge of contaminants. The BNL Sewage Treatment Plant has been upgraded and a proactive Pollution Prevention/Waste Minimization program has been implemented to reduce the generation of wastes at the source and the discharge of contaminants. The quality and contaminant levels in the Peconic River surface water, sediment, and fish have been characterized as part of BNL's cleanup and environmental monitoring programs. Pilot studies were conducted in March 2002 to demonstrate the effectiveness of two cleanup technologies. A high capacity vacuum/guzzler was tested in Area A and sediment removal/wetland restoration was demonstrated in Area D. Extensive screening of other more innovative technologies, such as electrochemical and phytoremediation, were also conducted. Information about these technologies and the pilot projects may be found at <http://www.bnl.gov/erd/peconic.html>.

### **2. Current Actions**

In January 2004, the DOE issued an Action Memorandum for the cleanup of the Peconic River sediments on BNL property and that work is currently in progress. In addition to the removal action being implemented, surface water, sediment, and fish monitoring are currently under way as part of BNL's routine environmental management programs. The surface water sampling will include analysis for methylmercury. The methylmercury data will be used to aid the evaluation by the IAG and SCDHS of the effectiveness of the cleanup and the potential need for additional action, particularly in the Manor Road area.

### **3. Planned Actions**

As previously stated, a public comment period for the Proposed Plan including cleanup of sediments outside BNL property was completed and the public comments received have been considered and, where appropriate, incorporated into the selected remedy. A *Draft Record of Decision, Operable Unit V Peconic River* has been submitted to the regulatory agencies for review and comment and will be finalized in the fall of 2004. This removal action will be consistent with and constitute a part of the final remedy. Surface water, fish, and sediment monitoring to address cleanup effectiveness will continue as part of BNL's environmental programs.

## **C. National Priorities List Status**

Brookhaven National Laboratory was added to the National Priorities List in 1989.

## **III. THREATS TO PUBLIC HEALTH OR WELFARE AND THE ENVIRONMENT STATUTORY AND REGULATORY AUTHORITIES**

### **A. Threats to Public Health or Welfare and the Environment**

This action is being undertaken as a voluntary removal action under an Interagency Agreement between the DOE, EPA, and NYSDEC. This action will address regulatory agency concerns, including those of NYSDOH and SCDHS, about contamination in Peconic River sediment and bioaccumulation of mercury and PCBs in fish. The appropriateness of the removal action is based on the following factors listed in 40 Code of Federal Regulations (CFR) 300.415 (b) (2) of the regulations implementing the National Contingency Plan:

- Actual or potential exposure to nearby human populations, animals, or the food chain from hazardous substances or pollutants or contaminants.
- Actual or potential contamination of drinking water supplies or sensitive ecosystems.
- Other situations or factors that may pose threats to public health or welfare of the United States or the environment.

## **IV. IDENTIFICATION OF REMOVAL ACTION OBJECTIVES**

Removal action objectives for the sediment of the Peconic River outside BNL property are based on the evaluation of 1200 sediment samples and three risk assessments. Based on the results of these evaluations, the following Removal Action Objectives have been identified for sediment:

- Protect human health through the reduction of BNL-related contaminants (e.g., mercury) in sediment.
- Reduce or mitigate, to the extent practical, existing and potential adverse ecological effects of contaminants in the Peconic River.
- Prevent or reduce, to the extent practical, the migration of contaminants from locations outside BNL property to other areas where risk may become unacceptable.

## **V. PROPOSED ACTION AND ESTIMATED COSTS**

### **A. Proposed Action**

The removal action addresses all areas outside BNL property originally identified in Alternative 4 of the Proposed Plan. The action involves the removal of contaminated sediments in Areas D, E, and P to achieve an average concentration of 0.75 ppm mercury through the portion of the Peconic River from the Laboratory property to Schultz Road, with a goal of no sample in any excavated area exceeding 2 ppm mercury. Also, three areas identified near Manor Road will have contaminated sediments removed with a goal of no sample in any excavated area exceeding 2 ppm mercury. Co-located contaminants will also be removed.

The major features of this action include stream dewatering, the excavation and removal of the sediment layer, dewatering of removed sediment, disposal of sediment at a licensed off-site landfill facility, wetland restoration as needed and installation of access paths for removal equipment. Details will be determined during the preparation of project work plans. Post-excavation sampling will be performed to confirm that cleanup goals have been met. Construction and long-term monitoring of surface water, sediment, and fish will ensure effectiveness. No remedial activities will be performed outside BNL property in the Suffolk County Robert Cushman Murphy Park until an access agreement has been finalized.

### **B. Contribution to the Remedial Performance**

This removal action will contribute to the overall cleanup of the Peconic River by removing a significant amount of contaminated sediment. The Peconic River is identified as Area of Concern 30 in the Interagency Agreement. A future Record of Decision will document the final remedy. This action will be consistent with the final remedy.

### **C. Description of Alternative Technologies**

In December 2000, BNL hosted a Peconic River cleanup workshop that involved national and international environmental restoration companies. Regulatory agency personnel, the DOE and BNL staff, and community members attended the workshop. The workshop focused on the identification of alternative technologies that might be capable of reducing wetland damage while achieving the necessary cleanup objectives.

Based on the results of this workshop, it was determined that additional technologies should be evaluated. During 2001 and through early 2002, several technologies were evaluated, and two (i.e., vacuum guzzling and sediment removal with wetland restoration) were field tested by pilot studies that were completed during the spring of 2002. Sediment removal/wetland restoration will be used for the work to be performed under this removal action.

## **D. Applicable or Relevant and Appropriate Requirements**

The National Contingency Plan, Section 300.430 (e)(9)(iii)(B), requires that removal attain the Federal and State Applicable and Relevant and Appropriate Requirements (ARARs) to the extent practicable. While there are no promulgated Federal or State cleanup standards for contaminated sediment, there are requirements that apply to the removal action. The significant ARARs are highlighted below.

### **1. Chemical-Specific ARARs**

Federal and State regulations define hazardous wastes. All wastes classified as hazardous will be handled, stored, and disposed of off-site at a permitted facility in accordance with these regulations. State regulations pertaining to air emissions control requirements will also be followed (6 New York Codes, Rules, and Regulations Part 212, General Process Emission Sources). State guidelines for surface water (6 NYCRR Part 703) are also applicable and TOGS 1.1.1 are to be considered. There are no chemical specific ARARS that apply for sediment.

### **2. Location-Specific ARARs**

Federal and State wetland regulations require that impacts to wetlands be minimized unless no other viable option exists. The pilot studies conducted on the Peconic River have demonstrated that the sediment removal techniques are effective at minimizing disturbance to sensitive wetland environments. Wetland restoration techniques have also been demonstrated to be effective through a pilot study. This removal will use the same techniques to minimize damage to the wetlands. As the Peconic River is a New York State designated Wild and Scenic River, equivalency permit requirements will be reviewed with NYSDEC for land access and the wetland excavation and restoration.

### **3. Action-Specific ARARs**

Action specific requirements include 33 CFR 320.2 Dredge and Fill Operations and state and federal discharge regulations.

### **4. To-be-Considered (TBC) Guidance**

In implementing this Removal Action, the important non-promulgated guidance, known as To Be Considered's (TBCs), will also be followed.

## **E. Project Schedule**

The current working schedule calls for the removal action including all waste disposal to be initiated in late summer of 2004 and restoration completed by spring 2005. Long-term monitoring will continue at least until the five-year remedy review. Lessons learned from the

removal action on BNL property have been incorporated in the remediation work plans for cleanup outside BNL property.

## **F. Estimated Costs**

### **VI. EXPECTED CHANGE IN THE SITUATION SHOULD ACTION BE DELAYED OR NOT TAKEN**

A delayed action or no action will increase the potential for continued bioaccumulation of contaminants in fish. This removal action allows for an early start while the Record of Decision is being finalized. This action is best performed during the dry season (typically late summer to early winter) when water levels are low and sections of the river are dry.

### **VII. PUBLIC PARTICIPATION**

Extensive public participation on this project has been conducted over a period of several years. This remedy reflects many aspects of that participation.

Public participation for this Removal Action included issuing a public notice of availability in a local newspaper coinciding with the submission of the *Proposed Plan for Operable Unit V, Peconic River and the Feasibility Study Addendum, Operable Unit V, Peconic River* to the Administrative Record. The public was invited to attend two information sessions, one in Riverhead and one at BNL. These activities took place during the thirty-day public comment period.

Peconic River updates will continue to be provided to the BNL Community Advisory Council and Brookhaven Executive Roundtable. Additional Peconic River-related information is available to the public from the Peconic River project website (<http://www.bnl.gov/erd/peconic.html>) and *cleanupupdate* newsletter.

### **VIII. OUTSTANDING POLICY ISSUES**

There are no outstanding policy issues identified for this removal action.

### **IX. RECOMMENDATION**

This document recommends a non-time-critical removal action for the Peconic River outside BNL property. This decision document was developed in accordance with CERCLA and is consistent with the National Contingency Plan.

## **X. REFERENCES**

BNL, 2003. *Action Memorandum Peconic River Removal Action for Sediment on BNL Property*, Brookhaven National Laboratory, Upton, N.Y., January 20, 2004.

BNL, 2004a. *Proposed Plan for Operable Unit V: Peconic River Brookhaven National Laboratory*. Brookhaven National Laboratory, Upton, N.Y, May 2004.

BNL, 2004b. *Feasibility Study Addendum Operable Unit V: Peconic River*, Brookhaven National Laboratory, Upton, N.Y, May 2004.