UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND - REGION I
1 CONGRESS STREET, SUITE 1100 (HBT)
BOSTON, MASSACHUSETTS 02114-2023

November 6, 2006

Curtis Frye
Dept of the Navy, BRAC PMO Northeast
Code 5090 BPMO NE/CF, 4911 South Broad St
Philadelphia, PA 19112-1303

Re: First Five Year Review for the former Davisville Naval Construction Battalion Center, North Kingstown, RI

Dear Mr. Frye:

On March 72, 2003, the Environmental Protection Agency (EPA) concurred with the Navy's deferral of the protectiveness determination for the Davisville Naval Construction Battalion Center (NCBC) National Priorities Listed Site. The Navy and EPA agreed to collect data at the two operable units (OU) for the Allen Harbor Landfill (OU1) and the Calf Pasture Point Solvent Disposal Area (OU8) and then make a determination of the protectiveness of the remedy in the next five year review. The Navy has collected and reported on eighteen rounds of quarterly sampling data at OU1 and only six rounds of data at OU8.

This letter is to remind the Navy of the requirement to collect enough data and to evaluate that data to determine the effectiveness and the protectiveness of the remedies at both OU1 and OU8 in the next five year review. EPA will continue to defer the protectiveness determination until the next five year review which is due on March 27, 2008. At that time, the Navy should have collected and reported on at least eight rounds of data at OUs 1 & 8. If you have any questions with regard to this letter, please contact me at (617) 918-1384.

Sincerely,

Christine A.P. Williams, RPM
Federal Facilities Superfund Section

cc: Louis Maccrone, RIDEM
Johnathan Reiner , ToNK
Steven King, RIEDC
Bryan Olson, EPA-NE
Monica McEddy, EPA-HQ

United States Environmental Protection Agency
One Congress Street, Suite 1100 (HBT)
Boston, MA 02114-2023

March 27,2003

Mr. Ed Boyle
Engineering Field Activity -North East (EFANE)
10 Industrial Highway, Code 182/EB - Mail Stop 82
Lester, PA 19113-2090

Re: *"First Five-Year Review Report for Former Naval Construction Battalion Center (NCBC) Davisville, North Kingston, Rhode Island",* dated February 2003

Dear Mr. Boyle:

Pursuant to § 7.6 of the Davisville Naval Construction Battalion Center Federal Facility Agreement dated March 23, 1992, as amended (FFA), the Environmental Protection Agency has reviewed the subject document. The Five-Year Review Report was submitted by the Department of the Navy (Navy) as the lead agency for the site. The Five-Year Review Report evaluated the protectiveness of each OU as required by the *Comprehensive Five-Year Review Guidance*, EPA540-R-01-007 (OSWER Directive No. 9355.7-03B-P).

The report addresses nine OUs that make up the NCBC Site pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). The OUs with remedies in place are: OU1-Allen Harbor Landfill and OU8-Calf Pasture Point. The Navy also included an evaluation of two additional OUs which are still being investigated: OU7-CED Solvent Disposal Area and OU9-Creosote Dip Tank and Former Fire Fighting Training Area and a status report of an area under preliminary investigation. Also included are a history of the other five OUs where No Further Action remedies were selected and therefore a five-year review is not required under CERCLA.

EPA concurs with the Navy's findings as presented in the Report and outlined below. According to the Five-Year Review Report, the protectiveness determinations of OU 1, OU 8, OU 7 & OU 9 were all deferred because additional information is needed in all cases. For OU 1, the Long Term Monitoring Plan states that eight rounds of sampling will be completed prior to determining the protectiveness of the remedy. As of this date, five rounds of sampling have been attempted, but not all piezometer sample aliquots have been collected. Additional piezometers will be installed at each of the ten current locations to obtain all planned sample aliquots for analysis over the next three sampling rounds. The evaluation of this data is expected to occur by May 2004.

For OU8, the Long Term Monitoring Plan also states that eight rounds of sampling will be completed prior to determining the protectiveness of the remedy. As of this date two rounds of

sampling have been accomplished. Evaluation of this data indicated a data gap in understanding contaminant migration to the west from the source area. A second data gap exists regarding the plume pathway from the source to either the southeast or east. Additional wells and piezometers are planned to be installed. Since monitoring occurs on an every nine month basis, the protectiveness of the remedy can not be determined until September 2006.

While OU 7 and OU 9 are still in the investigative stage, EPA is aware that both sites have deep chlorinated solvent plumes. No surface sources have been found. Therefore, while the ground water is known to be contaminated above MCLs, no unacceptable risk in soils has been found for the current land use. RODS are expected in 2007 and 2005, respectively, for these OUs.

Even though a protectiveness determination has been deferred for the Davisville, NCBC Site, the Site is expected to be protective because of the effective implementation of institutional controls through the Land Use Control Implementation Plan (LUCIP), that has prevented human exposure to or ingestion of, contaminated groundwater and restricts land use. Therefore, the monitoring, reporting, and enforcement of all land use/institutional controls remains paramount to the continued protectiveness of the remedies. Continued optimization of the groundwater monitoring system and ground water discharge areas at the shorelines will provide data to ensure that contaminated ground water from the OUs pose no unacceptable risk to human health or the environment. EPA expects the Navy to take all necessary steps to ensure that its enforcement and monitoring of ICs and ground water monitoring efforts are effective in order to ensure that the remedies remain protective.

Consistent with Section 121(c) of CERCLA and EPA's Comprehensive Five-Year Review guidance, the next five-year review for this Site must be finalized on or before March 30,2008.

Sincerely,

Richard Cavagnero, Acting Director
Office of Site Remediation and Restoration

cc: Richard Gottlieb, RIDEM
Michael Hurd, EPA HQ
Kymberlee Keckler, EPA
David Peterson, EPA
Christine Williams, EPA
Marilyn Cohen, ToNK
Howard Cohen, RIEDC

Five-Year Review Report

First Five-Year Review Report
For
Former Naval Construction Battalion Center (NCBC) Davisville
North Kingstown, Rhode Island

Contract No. N62472-92-D-1296
Contract Task Order No. 0043

Prepared for

Department of the Navy
Engineering Field Activity Northeast
Naval Facilities Engineering Command
10 Industrial Highway
Mail Stop No. 82
Lester, Pennsylvania 19113-2090

Approved by:

Captain Robert B. Raines, CEC, USN
Commanding Officer EFANE

26 Mar 03
Date

March 2003
Version: FINAL
EA Project No. 29600.99.3550

FIRST
FIVE-YEAR REVIEW REPORT
FOR
FORMER NAVAL CONSTRUCTION BATTALION CENTER (NCBC) DAVISVILLE
NORTH KINGSTOWN, RHODE ISLAND

Contract No. N62472-92-D-1296
Contract Task Order No. 0099

Prepared for

Department of the Navy
Engineering Field Activity Northeast
10 Industrial Highway, Mail Stop No. 82
Lester, Pennsylvania 19113-2090

Prepared by

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March 2003
FINAL
EA Project No. 29600.99.3550

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LIST OF ACRONYMS

ARAR	Applicable, relevant and appropriate requirement
AWQC	Aquatic water quality criteria
BCT	BRAC cleanup team
bgs	Below ground surface
BRAC	Base realignment and closure
CED	Construction Engineering Division
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act, 1980
COC	Contaminants of concern
CSF	Cancer slope factor
CSM	Conceptual site model
CVOC	Chlorinated volatile organic compounds
DANC	Decontaminating agent non-corrosive
DD	Decision document
EBS	Environmental baseline survey
EFANE	Engineering Field Activity Northeast
ELUR	Environmental land-use restrictions
EPA	U.S. Environmental Protection Agency
EPC	Exposure point concentration
ERA	Ecological risk assessment
ESD	Explanation of significant difference
FFA	Federal facilities agreement
FFTA	Fire fighting training area
FOST	Finding of suitability to transfer
FUDS	Formerly utilized defense sites
FWENC	Foster Wheeler Environmental Corporation
HEAST	Health effects assessment summary tables
HHRA	Human health risk assessment
HI	Hazard index
HRS	Hazardous ranking system
IAS	Initial assessment study
IGWSE	Interim ground-water sampling event
IGWSP	Interim ground-water sampling program
IR	Installation Restoration
LOEC	Lowest observed effect concentration

LTM	Long-term monitoring
LTMP	Long-term monitoring program
LUCP	Land-use control implementation plan
MCL	Maximum contaminant level
ME	Monitoring event
MSL	Mean sea level
NAS	Naval Air Station
NCBC	Naval Construction Battalion Center
NCEA	National Center for Environmental Assessment
NCP	National [Oil and Hazardous Substances Pollution] Contingency Plan
NFA	No further action
NPL	National Priorities List
PAH	Polycyclic aromatic hydrocarbons
PAL	Project action level
PCB	Polychlorinated biphenyls
ppm	Parts per million
PRG	Preliminary remediation goal
QNP	Quality assurance project plan
RAB	Restoration Advisory Board
RAO	Remedial action objectives
RBSC	Risk-based screening calculation
RfD	Reference dose
RI	Remedial investigation
RI/FS	Remedial Investigation/Feasibility Study
RIDEM	Rhode Island Department of Environmental Management
RIEDC	Rhode Island Economic Development Corporation
RIPA	Rhode Island Port Authority
RME	Reasonable maximum exposure
ROD	Record of decision
RPM	Remedial project manager
SARA	Superfund Amendments and Reauthorization Act, 1986
SVOC	Semi-volatile organic compounds
TCE	Trichloroethene
TPH	Total petroleum hydrocarbons
USACE	U.S. Army Corps of Engineers
UST	Underground storage tank
VOC	Volatile organic compounds

EXECUTIVE SUMMARY

The former Naval Construction Battalion Center (NCBC) Davisville facility, located in North Kingstown, Rhode Island, includes 13 sites and 3 study areas. Two of the sites are active sites for which the selected remedy includes hazardous substances, pollutants, or contaminants remaining above levels that allow for unlimited use and unrestricted exposure (Site 07 – Calf Pasture Point, and Site 09 – Allen Harbor Landfill). Another 3 of the sites and 2 of the study areas are active sites that are in the investigation phase (Study Areas 01 and 04 and Sites 02 and 03 – the Construction Engineering Division [CED] area, and Site 16 – Former Creosote Dip Tank Area and Suspected Former Fire Fighter Training Area). The remaining 9 sites and 1 study area have been determined through investigation and/or removal action to require No Further Action (NFA), not requiring five-year review. The trigger for this first five-year review of the former NCBC Davisville facility is the initiation of the first remedy that left waste in place at concentrations above unrestricted use levels, (i.e., the remedy for Site 09 [Allen Harbor Landfill]), and specifically the remedy initiation letter from the Navy dated 30 March 1998.

For Site 09, as stated in the ROD signed 29 September 1997, the remedy includes the construction of a multimedia cap (including a passive gas venting system), stone shoreline revetment, an offshore breakwater, and the construction of inter-tidal wetlands, along with long- term monitoring (LTM) of ground water, sediment, shellfish, and landfill gas, plus institutional controls (deed restrictions on land and ground-water use). A protectiveness determination of the remedy at Site 09 cannot be made at this time until further information is obtained. Site 09 LTM plan states that 8 rounds of sampling will be completed prior to determining the protectiveness of the cap. As of this date 3 rounds of sampling have been completed. It is estimated that the 8 rounds of sampling will be completed by May 2004, at which time a protectiveness statement will be made. The remedy is expected to be protective of human health and the environment as long as the cap and institutional controls remain in place. Remedy of the site has been addressed through stabilization and capping of the waste and contaminated soil, gas vents, covering of most of the shoreline sediment with the constructed wetland, the installation of fencing and warning signs, and the implementation of institutional controls through the Land-Use Control Implementation Plan (LUCIP) to prevent exposure to, or ingestion of, contaminated ground water and to prevent ground surface activities (e.g., building, motorized vehicles except for LTM activities, digging) that could negatively impact the integrity of the landfill cap. The outstanding issue is the inconclusiveness of the available shoreline piezometer sample data to confirm the quality of ground water discharging from the site to the nearshore. Additional piezometers will be installed at each of the 10 locations to attempt to obtain all planned sample aliquots for analysis starting with ME 05 or ME 06. The results of the future complete analyses are hoped to aid in the determination of the representativeness of this sampled area. In addition, the Navy is considering conducting additional studies and/or other evaluations in the shoreline environment in order to better identify areas where plume discharge has the potential to occur, and to optimize long-term monitoring locations accordingly.

For Site 07, as stated in the ROD signed 30 September 1999, the remedy includes institutional controls (deed restrictions on land and ground-water use) as implemented by the LUCIP and LTM of ground water and sediment. A protectiveness determination of the remedy at Site 07

can not be made at this time until further information is obtained. Site 07 LTM plan states that 8 rounds of sampling will be completed prior to determining the protectiveness of the remedy. As of this date, 3 rounds of sampling have been completed. It is estimated that the 8 rounds of sampling will be completed by November 2006, at which time a protectiveness statement will be made. Based on the reviewed data, the Site 07 remedy is expected to be protective of human health and the environment as long as the institutional controls remain in place as implemented through the LUCIP, and in the interim, the exposure pathways that could result in unacceptable risk are being monitored, including consideration of conducting additional studies and/or other evaluations in the shoreline environment in order to better identify areas where plume discharge has the potential to occur, and to optimize long-term monitoring locations accordingly.

For Study Areas 01 and 04, and Sites 02 and 03, these sites are under the remedial investigation (RI) phase and so a ROD has not yet been signed for this area; i.e. the remedy for these sites have not been selected. A protectiveness determination of the remedy at these sites can not be made at this time until further information is obtained. The remedy is expected to be implemented in 2007, at which time a protectiveness determination will be made.

For Site 16, this site is under the RI phase and so a ROD has not yet been signed for this area; i.e. the remedy for this site has not been selected. A protectiveness determination of the remedy at this site can not be made at this time until further information is obtained. The remedy is expected to be implemented in 2006, at which time a protectiveness determination will be made.

For the West Davisville Aircraft Counterweight Discovery and Identification area, this location is under a preliminary investigative stage and so a ROD has not yet been signed for this location. A protectiveness determination can not be made at this time until further information is obtained. Further information will be obtained from the preliminary investigative fieldwork planned for Spring 2003. A protectiveness determination will be made once the investigation is completed and a remedy is implemented (if needed).

EPA's Five-Year Review Summary Form

SITE IDENTIFICATION

Site name: Former Naval Construction Battalion Center Davisville Facility

EPA: RI6170022036

Region: I | **State:** RI | **City/County:** Washington County

SITE STATUS

NPL status: Final X Deleted Other (specify) _____

Remediation status (choose all that apply): Under construction Operating X Complete

Multiple OUs?* YES X NO | **Construction completion date:** / /

Has site been put into reuse? YES X* NO * = portions of the former facility

REVIEW STATUS

Lead agency: EPA State Tribe Other Federal Agency U.S. Department of the Navy

Author name: Prepared by EA Engineering, Science, and Technology under contract to U.S. Department of the Navy, Engineering Field Activity Northeast (EFANE)

Author title: **Author affiliation:**

EPA's Review period: 12 / 20 / 2002 to 03 / 30 / 2003

Date(s) of site inspection: 3 /14 / 2003 / Various for Parcels 03, 07, 09, and 10

Type of review: Post-SARA X Pre-SARA _____ NPL-Removal only _____
Non-NPL Remedial Action Site _____ NPL State/Tribe-lead _____
Regional Discretion _____

Review number: 1 (first) X 2 (second) 3 (third) Other (specify)

Triggering action:

Actual RA Onsite Construction at OU # _____ Actual RA Start at OU # 1

Construction Completion _____ Previous Five-Year Review Report _____

Other Submittal of the remedy initiation letter from the Navy dated 30 March 1998 for the Allen Harbor Landfill

Triggering action date: 03 / 30 / 1998

Due date *(five years after triggering action date)*: 03 / 30 / 2003

NOTES:
* "OU" refers to operable unit.

Navy designation	EPA designation
Site 09	OU1
Site 12	OU2
Sites 05 and 08 (soils only)	OU3
Sites 06, 11, and 13	OU4
Sites 10 and 08 (ground water only)	OU5
Site 14	OU6
Study Areas 01 and 04, and Sites 02 and 03	OU7
Site 07	OU8
Site 16	OU9

Five-Year Review Summary Form, cont'd.

Issues:
Summarize issues.

For Site 07:
Additional data needed to refine the conceptual site model (CSM), the understanding of the hydrogeology from source area(s) southwest to the harbor 'cove' area and chlorinated volatile organic compounds (CVOC) plume migration in central portion of the site.
Environmental land-use restriction (ELUR) has not yet been recorded.

For Site 09:
Additional monitoring data required to assess ground-water discharge to the shoreline.
Identified minor maintenance needs to the landfill cap that do not impact the integrity of the remedy.
Sustainability of the plants in the southern portion of the constructed wetland.
Deed and ELUR have not yet been recorded.
Completeness of the monitoring well network.

For Study Areas 01 and 04. and Sites 02 and 03:
These sites are still under investigation. However, completion of the investigation and Record of Decision (ROD) are being delayed at least 1–2 years until a remedy is implemented by U.S. Army Corps of Engineers – New England District (USACE-NED) for the source area of the dissolved CVOC plume in deep ground water from the adjacent, upgradient former PR-58 Nike Site property. Based on discussions during the 12 September 2002 Base Closure Team (BCT) Meeting, if the former PR-58 Nike Site compliance wells were installed by 2004 and Rhode Island Department of Environmental Management (RIDEM) concurrence was obtained for the PR-58 Nike Site in 2005, there could be a ROD in 2007 for Study Areas 01 and 04 and Sites 02 and 03.

For Site 16:
This site is still under investigation.

For the West Davisville Aircraft Counterweight Discovery and Identification area:
This location is still under investigation.

Recommendations and Follow-up Actions:
Summarize recommendations and follow-up actions.

For Site 07:
1) For southwest extent from source: Add five monitoring wells (MW07-35D. a shallow and deep overburden well pair at SB07-05,and a shallow and deep overburden well pair between MW07-04 and MW07-35). This would be dependent on availability of Navy funds.
2) For plume migration in central portion of the site: Add three monitoring wells (MW07-27S and a shallow and deep overburden well pair approximately 125-150 ft east of MW07-26s). This would be dependent on availability of Navy funds.
3) To expand quantitative understanding of the harbor shoreline: Add to ME 03 (February 2003) approximately 9 piezometer locations between P07-18 and P07-19 to cover the remaining portion of the harbor shoreline that had not previously been sampled (Figure 2).
4) Work with the Town to expedite recording of the ELUR.

For Site 09:
1) Continue to attempt to obtain all planned piezometer sample aliquots for analysis; particularly the salinity aliquot to aid assessment of representativeness of ground-water discharge.
2) Evaluation of the need for abandonment and replacement of MW09-141 and MW09-09D after evaluation of the ME 08 results.

Five-Year Review Summary Form, cont'd.

Recommendations and Follow-up Actions: (cont'd)

3) Repair of rutting in the Long-Term Monitoring Program (LTMP) dirt access roads.

4) Removal of vegetation from drainage pipe outlets and the southern drainage swale.

5) Re-seeding of bare spots on the cap surface.

6) Consider installation of additional geotextile over the area east of piezometer P09-03 where there appears to be some channeling of tidal waters through the breakwater structure.

7) Repair of the small sections of exposed geotextile fabric along the top and toe of the revetment and the breakwater structure.

8) Removal of two large shrubs in the vicinity of gas vent GV09-05 as a precaution so their roots do not impact the multimedia cap.

9) Assess whether or not replanting of the southern portion of the constructed wetland is appropriate.

10) Work with the Town and National Park Service to expedite property transfer and recording of the deed and ELUR.

11) Assess whether or not to replace damaged monitoring wells and/or consider adding wells to the monitoring network.

For Study Areas 01 and 04, and Site 02 and 03:
Continue the Interim Ground-Water Sampling Program (IGWSP) and await the completion of the USACE work at the adjacent, upgradient former PR-58 Nike Site so the Remedial Investigation/Feasibility Study (RI/FS) and ROD can be completed for this portion of the Navy's Parcel 7.

For Site 16:
Complete the remedial investigation and feasibility study.

For the West Davisville Aircraft Counterweight Discovery and Identification area:
Complete the preliminary investigation.

Protectiveness Statement(s):
Include individual operable unit protectiveness statements. For sites that have reached construction completion and have more than one OU, include an additional and comprehensive protectiveness statement covering all of the remedies at the site.

For Site 07:
A protectiveness determination of the remedy at Site 07 cannot be made at this time until further information is obtained. Site 07 LTM plan states that 8 rounds of sampling will be completed prior to determining the protectiveness of the remedy. As of this date, 3 rounds of sampling have been completed. It is estimated that the 8 rounds of sampling will be completed by November 2006, at which time a protectiveness statement will be made. Based on the reviewed data, the Site 07 remedy is expected to be protective of human health and the environment as long as the institutional controls remain in place as implemented through the Land-Use Control Implementation Plan (LUCIP), and in the interim, the exposure pathways that could result in unacceptable risk are being monitored, including consideration of conducting additional studies and/or other evaluations in the shoreline environment in order to better identify areas where plume discharge has the potential to occur, and to optimize long-term monitoring locations accordingly.

For Site 09:
A protectiveness determination of the remedy at Site 09 cannot be made at this time until further information is obtained. Site 09 LTM plan states that 8 rounds of sampling will be completed prior to determining the protectiveness of the cap. As of this date 3 rounds of sampling have been completed. It

Five-Year Review Summary Form, cont'd.

For Site 09: (continued)
is estimated that the 8 rounds of sampling will be completed by May 2004, at which time a protectiveness statement will be made. The remedy is expected to be protective of human health and the environment as long as the cap and institutional controls remain in place. Remedy of the site has been addressed through stabilization and capping of the waste and contaminated soil, gas vents, covering of most of the shoreline sediment with the constructed wetland, the installation of fencing and warning signs, and the implementation of institutional controls through the LUCIP to prevent exposure to, or ingestion of, contaminated ground water and to prevent ground surface activities (e.g., building, motorized vehicles except for LTM activities, digging) that could negatively impact the integrity of the landfill cap. The outstanding issue is the inconclusiveness of the available shoreline piezometer sample data to confirm the quality of ground water discharging from the site to the nearshore. Additional piezometers will be installed at each of the 10 locations to attempt to obtain all planned sample aliquots for analysis starting with ME 05 or ME 06. The results of the future complete analyses are hoped to aid in the determination of the representativeness of this sampled area. In addition, the Navy is considering conducting additional studies and/or other evaluations in the shoreline environment in order to better identify areas where plume discharge has the potential to occur, and to optimize long-term monitoring locations accordingly.

For Study Areas 01 and 04, and Sites 02 and 03:
These sites are under the remedial investigation (RI) phase and so a ROD has not yet been signed for this area; i.e. the remedy for these sites has not been selected. A protectiveness determination of the remedy at this OU can not be made at this time until further information is obtained. The remedy is expected to be implemented in 2007, at which time a protectiveness determination will be made.

For Site 16:
This site is under the RI phase and so a ROD has not yet been signed for this area; i.e. the remedy for this site has not been selected. A protectiveness determination of the remedy at this OU can not be made at this time until further information is obtained. The ROD is expected in FY 2005. The remedy is expected to be implemented in 2006, at which time a protectiveness determination will be made.

For the West Davisville Aircraft Counterweight Discovery and Identification area:
This location is under a preliminary investigative stage and so a ROD has not yet been signed for this location. A protectiveness determination cannot be made at this time until further information is obtained. Further information will be obtained from the preliminary investigative fieldwork planned for Spring 2003. A protectiveness determination will be made once the investigation is completed and a remedy is implemented (if needed).

1. INTRODUCTION

Under Contract No. N62472-92-D-1296, Contract Task Order No. 0099, the Department of the Navy, Engineering Field Activity Northeast (EFANE) contracted with EA Engineering, Science, and Technology (EA) to prepare this Five-Year Review Report for the Former Naval Construction Battalion Center (NCBC) Davisville, North Kingstown, Rhode Island.

1.1 OVERVIEW OF THE FIVE-YEAR REVIEW PROCESS

The purpose of the five-year review process is to determine whether the remedies at sites are or are expected to be protective of human health and the environment through review of the available reports for the former NCBC Davisville facility. The findings and conclusions of the review are documented in this report for the former NCBC Davisville facility.

The following presents the requirements for five-year reviews:

a. The statutory requirement for five-year review was added to Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) as part of the Superfund Amendments and Reauthorization Act of 1986 (SARA). A five-year review is required when **both** of the following conditions are met, whether the site is on the National Priorities List (NPL) or not:

   1) Upon completion of the remedial actions at a site, hazardous substances, pollutants, or contaminants will remain above levels that allow for unlimited use and unrestricted exposure. For example, if a site is restricted to industrial use because hazardous substances, pollutants, or contaminants remain above levels that allow for unlimited use and unrestricted exposure, five-year reviews must be conducted.

   2) The Record of Decision (ROD) or Decision Document (DD) for the site was signed on or after October 17, 1986 (the effective date of SARA).

b. CERCLA § 121(c), as amended, states:

   If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each five years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented. In addition, if upon such review it is the judgment of the President that action is appropriate at such site in accordance with section [104] or [106], the President shall take or require such action. The President shall report to the Congress a list of facilities for which such review is required, the results of all such reviews, and any actions taken as a result of such reviews.

c. The National Contingency Plan (NCP), 42 U.S.C. 0962 1(c), implementing regulations, 40 C.F.R. Part 300.430(f)(4)(ii), provide:

> *If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after initiation of the selected remedial action.*

This Five-Year Review Report has been prepared in accordance with the U.S. Environmental Protection Agency (EPA) Comprehensive Five-Year Review Guidance, June 2001, EPA 540-R-01-007, OSWER No. 9355.7-03B-P, and the U.S. Department of the Navy Policy for Conducting Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Statutory Five-Year Reviews (U.S. Navy 2001). The EPA would include all 16 of the sites and study areas at the former NCBC Davisville facility in the five-year review. The locations of these sites and study areas are shown in Figure 1. The Navy has prepared the following two chapters:

1) Chapter 2—Includes the active sites for which the selected remedy includes hazardous substances, pollutants, or contaminants remaining above levels that allow for unlimited use and unrestricted exposure (Site 07 – Calf Pasture Point, and Site 09 – Allen Harbor Landfill) located in Parcels 9 and 10 and shown in Figures 1-5.

2) Chapter 3—Includes the active sites that are in the investigation phase (Study Areas 01 and 04 and Sites 02 and 03 – the Construction Engineering Division (CED) area, and Site 16 – Former Creosote Dip Tank Area and Suspected Former Fire Fighter Training Area) located in Parcel 7 and shown in Figure 1 and Figures 6-10.

The description and status of the nine sites and one study area for which No Further Action (NFA) has been determined through investigation or removal action (Sites 05, 06, 08, 10, 11, 12, 13 and 14, and Study Area 15) are provided as Appendix A and their locations are shown in Figure 1.

In keeping with the requirements of CERCLA § 121(c) and the NCP, initiation of a selected remedial action for a site at an installation that will result in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure after the remedial action is complete is the "trigger" that starts the five-year review clock. The first site on an installation that triggers the five-year review clock triggers the five-year review clock for the entire installation, or that portion of the installation addressed under the ROD or DD. The trigger for this first five-year review of the former NCBC Davisville facility is the initiation of the first remedy that left waste in place at concentrations above unrestricted use levels, (i.e., the remedy for Site 09 [Allen Harbor Landfill]), and specifically the remedy initiation letter from the Navy dated 30 March 1998. This is the first five-year review of the former NCBC Davisville facility and covers the period of 30 March 1998 to 31 December 2002.

The former NCBC Davisville facility was placed on the CERCLA NPL on 21 November 1989 supported by a Hazard Ranking System (HRS) scoring package that "used an aggregate of the two most seriously impacted sites ... Site 09 – Allen Harbor Landfill and Site 07 – Calf Pasture Point" (TRC 1994). A Federal Facilities Agreement (FFA) was signed by the Navy, the State of Rhode Island, and the EPA in March 1992. The FFA outlines the response action requirements under CERCLA and the Navy's Installation Restoration (IR) Program at NCBC Davisville and was developed in part to ensure that disposal sites are thoroughly investigated and remediated as necessary.

1.1.1 Community Involvement

During the January, March, and June 2002 Restoration Advisory Board (RAB) meetings, the community was informed of the five-year review process for the former NCBC Davisville facility and copies of a related EPA handout were provided by EPA entitled "Focus on 5-Year Reviews and Involving the Community, Checking Up on Superfund Sites" (U.S. EPA 2001). Persons with related comments and/or information were asked to contact the EPA Remedial Project Manager (RPM) and/or the Navy RPM. Notes of each RAB meeting are prepared and sent out to approximately 150 addressees on the NCBC Davisville community mailing list. A copy of the EPA handout was included with the notes of the January 2002 RAB meeting.

Upon completion of the five-year review and Five-Year Review Report, a brief summary of the report would be made during the March or June 2003 quarterly RAB meeting. The summary would include a short description of remedial actions, deficiencies, recommendations, and follow-up actions that are directly related to protectiveness of the remedies, and the determination(s) of whether the remedies are or are expected to be protective of human health and the environment. The summary would also provide the location of where a copy of the complete report can be reviewed, and provide the date of the next five-year review or notify the community that five-year reviews will no longer be necessary. Five-year reviews are not Administrative Record material and are not to be included therein. However, the Navy will ensure that the signed Five-Year Review Report is placed in the site information repository.

1.1.2 Facility Location and Description

The former NCBC Davisville facility is located in the Town of North Kingstown, Rhode Island, approximately 18 miles south of the state capital, Providence. NCBC Davisville (Figure 1) is composed of three areas: the Main Center (Zones 1–4), the West Davisville storage area, and Camp Fogarty – a training facility located approximately 4 miles west of the Main Center. Camp Fogarty was transferred to the U.S. Department of the Army in December 1993 and is assigned to the Rhode Island National Guard. Adjoining the southern boundary of the Main Center is the decommissioned Naval Air Station (NAS) Quonset Point, which was transferred by the General Services Administration to the Rhode Island Port Authority (RIPA) (currently named the Rhode Island Economic Development Corporation [RIEDC]) and others between 1975 and 1980.

NCBC Davisville's mission was to provide mobilization support to the active Naval Construction Force; to act as a mobilization base for the rapid assembly outfitting and readying of Reserve Construction Battalions; to store, preserve, and ship advanced base and mobilization stocks; and to procure, receive, pack, and ship collateral equipment for Atlantic, European, and Caribbean military construction projects. NCBC Davisville was comprised primarily of warehouse space and freight yards, most of which are currently demolished, redeveloped, or empty.

The history of NCBC Davisville is related to the history of Quonset Point. Quonset Point was the location of the first annual encampment of the Brigade Rhode Island Militia in 1893. During World War I, it was a campground for the mobilization and training of troops and later was the home of the Rhode Island National Guard. In the 1920s and 1930s, it was a summer resort. In 1939, Quonset Point was acquired by the Navy to establish a Naval Air Station, with construction beginning in 1940. By 1942, the operations at NAS Quonset Point had expanded into what is now called NCBC Davisville. Land at Davisville adjacent to NAS Quonset Point was designated the Advanced Base Depot. Also in 1942, the Naval Construction Training Center, known as Camp Endicott, was established to train the newly-established construction battalions.

While NAS Quonset Point remained a site of Naval activity, Davisville was inactive between World War II and the Korean Conflict. In 1951, it became the Headquarters Construction Battalion Center. The Construction Battalion Center loaded ships and trained men for both the Korean and Vietnam Conflicts. In 1974, the NAS and a Naval Air Rework Facility at Quonset Point were decommissioned, and operations at the Base were greatly reduced pursuant to the Shore Establishment Realignment Act of 1973. In 1989, NCBC Davisville was placed on the EPA NPL. In 1991, the closure of NCBC Davisville was announced, and operations were phased down to minimum staffing levels for public works, maintenance, security, and personnel. NCBC Davisville was decommissioned on 25 March 1994 and closed on 1 April 1994 under the Base Realignment and Closure (BRAC). A detailed description of the Base history can be found in the Final Basewide Environmental Baseline Survey (EBS) (EA 1995). NCBC Davisville was transferred to Northern Division, Naval Facilities Engineering Command, currently designated as EFANE, which has caretaker status pending disposal. EFANE is currently working closely with RIEDC towards lease or transfer of suitable parcels.

Adjacent and west of a portion of the former NCBC Davisville facility is a former Nike missile facility (Nike Battery Site PR-58) (Figure 1) that included three underground missile silos, a refueling area, a missile assembly and test building with an underground storage tank (UST), a generator building with a 4,000-gal UST, and personnel quarters (Metcalf & Eddy 1994). The facility (a Nike "Ajax"-only site) was constructed during the initial round of Nike Site construction in the mid-1950s and was equipped with short-range, conventionally-armed Nike Ajax missiles. The PR-58 facility was deactivated in 1962. This property then had two other reported historical activities. The Navy used the area west of the missile silos as a Disaster Recovery Training Area between 1964 and 1974 (SEC 1988). In 1978, the GSA transferred ownership to RIPA (now RIEDC). RIPA leased 2.2 acres of land to Peabody Clean Industries between 1980 and 1982 for use as a hazardous waste tank farm. Peabody Clean Industries

ceased operations in 1982 and conducted closure activities through 1983 (ERA 1984). In 1983, RIDEM directed Peabody Clean Industries in a cleanup of contaminated soil that had resulted from the Peabody Clean Industries activities at the site. RIPA (now RIEDC) removed the 4,000-gal UST at Building 345 and demolished many structures as part of cleanup/closure activities. Details of this property, located adjacent and upgradient of a portion of NCBC, are provided in the report "Characterization of CVOC Contamination at the Former PR-58 Nike Site and Adjacent Navy NCBC Davisville Site 03" (EA 2001g).

1.1.3 Facility Investigation History

An Initial Assessment Study (IAS) prepared for the Navy in September 1984 (Hart 1984) described the past waste generation and disposal practices at NCBC Davisville. The Initial Assessment Study and subsequent investigations identified 16 disposal areas at NCBC Davisville that have been addressed through the Department of Defense IR Program. The former NCBC Davisville facility was placed on the CERCLA NPL in November 1989. An FFA was signed by the Navy, the State of Rhode Island, and the EPA in March 1992. The FFA outlines the response action requirements under CERCLA and the Navy's IR Program at NCBC Davisville and was developed in part to ensure that disposal sites are thoroughly investigated and remediated as necessary.

During the Phase II EBS Program, the Navy investigated 97 locations at NCBC Davisville to evaluate whether or not hazardous substances or petroleum products had been disposed or released to the environment. The results were reported in the Final Phase II EBS Report (EA 1998d). Other facility-wide studies include the following:

- Confirmation Study -Verification Step Report (TRC 1987)
- Phase I RI Report (TRC 1991)
- Phase II RI Report (TRC 1994)
- Facility-Wide Freshwater/Terrestrial Ecological Risk Assessment (EA 1996b)
- Basewide Ground-Water Inorganics Study (Stone & Webster 1997).

1.2 ROLES AND RESPONSIBILITIES

EA has been contracted by EFANE to prepare this five-year review for the former NCBC Davisville with their review and input. The review team includes EPA and the Rhode Island Department of Environmental Management (RIDEM).

1.3 ORGANIZATION OF REPORT

Chapter 1 of this report presents the introduction and description of the five-year review process, description and background of the former NCBC Davisville, and community awareness. Chapter 2 presents the active sites with the selected remedy implemented. Chapter 3 presents the active sites that are still under investigation. Appendix A presents the status of sites for which NFA has been determined to be appropriate. Appendixes B and C provide support

documentation for Site 07 and Site 09, respectively. Appendix D provides copies of the responses to comments received from the regulatory agencies for the Draft and Revised Draft versions of this document.

1.4 NEXT FIVE-YEAR REVIEW

The next five-year review for the former NCBC Davisville facility is required by March 2008, five years from the date of this review

2. ACTIVE SITES IN LONG-TERM MONITORING

2.1 SITE 07 CALF PASTURE POINT

2.1.1 Introduction

Refer to Section 1.1 for description of the purpose of the five-year review.

2.1.2 Site Chronology

The following presents the chronology of site events:

- 1968-1974 – Sometime during this interval, a trench was reportedly filled with containers that contained Decontaminating Agent Non-Corrosive (DANC) solution (1,1,2,2-tetrachloroethane [1,1,2,2-PCA] and oxidizing agents that readily break down to release chlorine when contacted by water, which can be generally used as a disinfectant).

- September 1984 – Completion of the Initial Site Assessment of the former NCBC Davisville facility (Hart 1984).

- February 1987 – Completion of the Verification Step - Confirmation Study of the former NCBC Davisville facility (TRC 1987).

- 1989 – EPA's Hazard Ranking Scoring Package for the former NCBC Davisville facility.

- 21 November 1989 – NCBC Davisville facility placed on the CERCLA NPL.

- March 1992 – FFA signed by the Navy, EPA, and the State of Rhode Island.

- February 1997 – Munitions bunker Building 339 demolished by the Navy (FWENC 1997a).

- 11 September 1998 – Remedial Investigation completed (EA 1998a).

- 30 September 1999 – ROD signed.

- February 2000 – Class I survey of Parcel 9 completed and annotated with references to the deed for ground-water use and land-use restrictions.

- 7 March 2000 – Final Conceptual Long-Term Monitoring (LTM) Plan (CLTMP) which included establishment of the performance standards (NewFields 2000a).

- May 2000 – Finding of Suitability to Transfer (FOST) to transfer the property (Parcel 9) to the U.S. Department of Interior for transfer to the Town of North Kingstown,

Rhode Island (US. Navy 2000). The FOST includes the Environmental Land-Use Restrictions (ELUR) required by the ROD and deed covenants.

- September 2000 – Munitions bunker Buildings 59 and 60 demolished by the Navy (FWENC 2000a).
- July 2001 – Final Quality Assurance Project Plan (QAPP) for LTM of Site 07.
- August 2001 – LTM plan initiated with Monitoring Event (ME) 01.
- October 2001 – Parcel 9 received by the Town of North Kingstown and the deed recorded.
- January 2002 – Final Land-Use Control Implementation Plan (LUCIP) that includes the inspection procedures for Site 07 to document compliance with the land-use controls and/or deed covenants placed by the Navy on this transferred Navy property (Parcel 9).
- May 2002 – Site 07 Remedy Design Hydrogeologic Investigation Report (EA 2002f).
- May 2002 – Revision 01 to the Final Quality Assurance Project Plan for Long-Term Monitoring of Site 07 to add 14 piezometer sampling locations along the Allen Harbor shoreline and to add salinity to the analytical program for the piezometer samples.
- October 2002 – Shallow wells MW07-35S and MW07-36S installed along the Allen Harbor shoreline for the Long-Tern Monitoring Plan (LTMP) and will first be sampled during ME 03.

2.1.3 Background

2.1.3.1 Physical Characteristics

Calf Pasture Point is a peninsula located on the northeastern portion of NCBC Davisville (Figure 2). Site 07 is located in the southern portion of Calf Pasture Point (Parcel 9) on the northeastern edge of Allen Harbor (Figures 1-3). Narragansett Bay, the Harbor entrance, and the Harbor itself form the eastern, southern, and southwestern shorelines of Site 07, respectively. The north and west boundary of Parcel 9 is formed by Pettee Avenue, Finn Street, and Sanford Road (Figure 3). Residential properties are located north and west of Pettee Avenue and Finn Street. Calf Pasture Point contained three former munitions bunkers (Buildings 59, 60, and 339) located along Magazine Road. The bunkers were earthen-covered and were located in the middle of Calf Pasture Point just north, east, and south of a bedrock outcrop (a prominent hill with a maximum elevation of approximately 55 ft above mean sea level (MSL), the highest location on Calf Pasture Point located just north of monitoring well [MW] MW07-07S [Figure 1]). These bunkers were demolished by the Navy in February 1997 (Building 339) and September 2000 (Buildings 59 and 60). Site 07 comprises the forest and grass covered area of

Calf Pasture Point south of the former munitions bunkers (i.e., south of the bedrock outcrop to the Allen Harbor and Narragansett Bay shorelines [Figure 2]).

Based on water level measurements in monitoring wells at the site, ground water in the shallow and deep overburden is interpreted to flow toward the southwest in the western portion of the site and toward the south and southeast in the central and eastern portions of the site (EA 2002b). Ground water in the upper portion of the bedrock is interpreted to flow toward the south and southeast).

2.1.3.2 Land and Resource Use

The historic land use of the site has included the training of Naval Seabee (construction battalions) staff in the use of heavy construction from approximately the early 1940s to the mid-1970s. Additionally, a portion of the site was reportedly used for the disposal of cans of DANC solution.

Currently, the site is undeveloped property with forest and grass cover. Site 07 will not be used for residential purposes in the future because Calf Pasture Point has been transferred to the Town of North Kingstown as a Public Benefit Conveyance for use as an open space/conservation area. Acquisition in this manner restricts the transferee to use the property for the purpose of a park and recreation, in perpetuity, with no opportunity for residential or commercial development. Additionally, land-use restrictions, with compliance monitoring, have been placed on the land to ensure the property is not used in a manner that conflicts with the remedy.

Ground water underlying Calf Pasture Point has been classified by RIDEM as GA (i.e., presumed to be suitable for public or private drinking water use without treatment). Ground water at the Site 07 source area has been classified by RIDEM as GA-NA (i.e., non-attainment). Allen Harbor is used for recreational boating and contains two marinas. In 1984, RIDEM closed Allen Harbor to shellfishing due to suspected contamination from several sources in Allen Harbor. No ground-water production wells are located on, or downgradient of, Site 07. Allen Harbor is classified by RIDEM as SA {b} (i.e., class SA waters are designated for shellfish harvesting, contact recreational activities, and fish and wildlife habitat; the {b} designation indicates a “partial uses” status [that can affect the application of criteria] for waters in the vicinity of marinas and/or mooring fields where seasonal shellfishing closures are likely).

In accordance with the LUCIP (EA 2002g), Parcel 9 includes the following environmental land-use restrictions:

- These environmental land-use restrictions apply to the use of the contaminated site by the Grantee, its successors, and assigns, as delineated on Figure 3 (land-use restriction boundary).

- For the entire parcel, no construction of buildings for residential or commercial use.

- No construction or development of any building, structure, facility, or other improvement without adequate ventilation as approved by the Navy, EPA, and RIDEM within the portion of land south of the east-west line shown on Figure 3. This restriction will be required for as long as site conditions may pose an unacceptable risk to human health and the environment.

- For the entire parcel, water supply wells shall not be installed, nor shall ground water be utilized except for sampling or other remedial purposes.

LUCIP inspections of Parcel 9 are performed in conjunction with each Site 07 LTMP monitoring event, but no less frequently than annually, to document that there has been no variance from the environmental land-use restrictions stated above and that there has been no interference with the implemented remedy (i.e.; monitoring system).

The purpose of the environmental land-use restriction is to ensure:

- That the entire parcel shall be used for only park and recreational uses, not for residential or commercial use, as stated in the ROD.

- That no building, structure, facility or other improvement will be constructed without adequate ventilation in areas of the Contaminated Site (Site 07), where a risk exists from contaminated ground water.

- That ground water for the entire parcel shall not be withdrawn or utilized except for sampling or other remedial purposes.

- That the Contaminated Site as delineated on Figure 3 ('land-use restriction boundary') is used by the Grantee, its successors, and assigns, in accordance with the above restrictions.

2.1.3.3 History of Contamination

At some time between 1968 and 1974, a trench was reportedly filled with cans that contained DANC solution. This has been believed to be the source of the dissolved chlorinated volatile organic compound (CVOC) plume detected in deep ground water at the site. The approximate location of that disposal area has previously been inferred to be the vicinity of wells MW07-14D and MW07-31I (Figure 2). However, as more data have become available, it appears as though there may have been releases within a larger area between MW07-14D, MW07-04, and MW07-05. DANC is a reactive, chlorinated compound consisting of two separate chemicals that were mixed to form the decontaminating solution: 1,3-dichloro-5,5-dimethyl-hydantoin,a crystal; and acetylene tetrachloride (1,1,2,2-PCA), a heavy colorless liquid. 1,3-Dichloro-5,5-dimethyl-hydantoin and hydantoin products are oxidizing agents and readily break down to release chlorine when contacted by water. 1,3-Dichloro-5,5-dimethyl-hydantoin on contact with water will liberate hypochlorous acid

(CIHO), a very weak acid and strong oxidizing agent. In general, it can be used as a chlorinating agent, disinfectant, or industrial deodorant. In water treatment, it has been used as the active ingredient in powdered laundry bleach such as Sage's Dry Bleach and Colgate's Pruf. Hypochlorous acid can be used as a disinfectant.

2.1.3.4 Initial Response

None

2.1.3.5 Basis for Taking Action

Contaminants (cancer risk > 10^{-4} and/or HI>1)

Ground Water
Aluminum
Arsenic
Beryllium
Chromium
Manganese
Benzene
Chloroform
Vinyl chloride
1,1 -Dichloroethene (1,1 -DCE)
1,2-DCE total
1,1,2-Trichloroethane (1,1,2-TCA)
Tnchloroethene (TCE)
1,1,2,2-PCA
Tetrachloroethene (PCE)

Potential human health risks associated with exposure to the contaminants of concern (COC) were estimated through the development of several potential exposure pathways. This Human Health Risk Assessment (HHRA) was prepared in accordance with CERCLA guidance using the Phase I, II, and III RI data (TRC 1991, TRC 1994, and EA 1998a, respectively). These pathways were developed to reflect the potential for exposure to COC based on the present uses, the potential future uses, and the location of the site. The Base Reuse Plan for Calf Pasture Point specifies open space/conservation, which may include recreational activities. Accordingly, the Navy evaluated the following exposure scenarios: (1) future construction/remediation workers, (2) future recreational users (onsite recreation as well as swimmers in the entrance channel to Allen Harbor), (3) consumers of locally-caught, non-depurated shellfish, and (4) hypothetical future residents. The future recreational scenario included the assumption that a showering facility may be constructed utilizing ground water from the site; however, it is more likely that any future showering facility at Calf Pasture Point would use municipal water that is available in the area from the Town of North Kingstown. The exposure pathways considered to represent potentially completed pathways of exposure to COC in soil, ground water, and air, as well as offshore sediment, shellfish, and surface water are (1) future construction/remediation workers,

(2) future recreational users, (3) consumers of locally-caught, non-depurated shellfish, and (4) hypothetical future residents. The pathways evaluated in the HHRA for Site 07 are as follows:

Exposures via Soil

- Incidental ingestion of total soil (by future construction workers)
- Incidental ingestion of surface soil (by recreational users)

Exposures via Sediment

- Incidental ingestion of sediment (by recreational users)

Exposures via Ground Water

- Incidental ingestion of shallow ground water (by future construction workers)
- Consumption of deep/bedrock ground water (by hypothetical future residents)
- Inhalation of volatile organic compounds (VOC) from deep/bedrock ground water while showering (by recreational users)
- Dermal contact with deep/bedrock ground water while showering (by recreational users)

Exposures via Surface Water

- Incidental ingestion of surface water while swimming (by recreational child/adult users)
- Dermal contact with surface water while swimming (by recreational child/adult users)

Exposure via Shellfish

- Ingestion of shellfish taken from Allen Harbor adjacent to Site 07.

A detailed description of these scenarios can be found in Section 6.4 of Volume I of the Phase III Remedial Investigation (RI) (EA 1998a).

The primary COC at Site 07 were identified as CVOC, predominantly as 1,1,2,2-PCA and TCE in ground water. The constituents with non-carcinogenic Hazard Index (HI) greater than 1 or carcinogenic risk greater than 10^{-4} are listed at the beginning of this Section. The identified unacceptable human health risks associated with historical activities of the Navy at Site 07 were:

- Ingestion of deep and bedrock ground water by residential populations (due to elevated concentrations of volatile organic compounds [VOC] and several inorganics)

- Inhalation of VOC from deep and bedrock ground water by recreational populations while showering

- Dermal contact with VOC in deep and bedrock ground water by recreational populations while showering.

The HHRA also evaluated risks in shoreline/offshore sediment and shellfish; however, the identified risks associated with the consumption of shellfish were not attributable to the conditions at Site 07. No significant terrestrial ecological risks were identified at Site 07. The marine Ecological Risk Assessment (ERA) (SAIC 1996) evaluated risks to the environment in offshore sediment and shellfish samples collected along the western and southern shorelines of Calf Pasture Point. The majority of these samples were collected in potential areas where shallow ground water from Site 07 enters Allen Harbor and the entrance channel. VOC (the COC at Site 07) were not identified as a concern in either the shoreline sediment or shellfish samples. As such, the low risks to shellfish identified along the shoreline of Calf Pasture Point were not attributed to the conditions at Site 07. The marine ERA and the Phase III RI indicated that a cause-and-effect relationship could not be established between the conditions at Site 07 and the potential risk to the marine ecology.

Three former munitions bunkers on Calf Pasture Point have been demolished.

2.1.4 Remedial Actions

The ROD (EA 1999), signed 30 September 1999, presents the selected whole-site remedy (deed restrictions and LTM) for Site 07. The Navy has concluded that the selected remedial action is protective of human health and the environment.

As stated in the ROD (signed 30 September 1999), the Remedial Action Objectives (RAO) for Site 07 are to prevent human exposure to COC in deep and bedrock ground water and to ensure that the discharge of ground water to wetlands and offshore areas continues to pose no unacceptable risks from COC. The selected remedial alternative is deed restrictions and LTM and includes the following components:

- Deed restriction prohibiting the use of ground water in order to prevent human contact with, or use of, impacted ground water from the site (e.g., for drinking or showering purposes) maintained for as long as the site ground-water conditions may pose an unacceptable risk to human health or the environment. No ground-water use for any purpose (including showering, drinking, and irrigation) will be available onsite. In addition, any construction or development of any building, structure, facility, or other improvement within the southern portion of the property (Figure 3) shall be designed and constructed to include adequate ventilation as approved by the Navy, EPA, and RIDEM. The Grantee under the deed shall be required to submit a yearly certification to the Navy, EPA, and RIDEM of compliance with the deed restrictions. The ground-water and land-use restrictions contained in the deed shall be incorporated into an ELUR, which also shall be filed and recorded by the Navy or disposal agency in the land records of the Town of North Kingstown, Rhode Island, in accordance with state and local law. This will permit the restrictions to run with the land and be enforceable by the Navy, EPA, and RIDEM against any future Successors in Interest.

- Long-term monitoring of the ground-water plume to ensure that the site continues to pose no unacceptable risks to human health and the environment. Other media such as sediment from the shoreline or interior wetlands will also be sampled, based upon trends identified from ground-water data. LTM plans will be submitted for regulatory agency review and concurrence. Performance standards satisfactory to the Navy, EPA, and RIDEM will be developed during the Remedial Design Phase.

- Five-year reviews of the decision for the site by the Navy, EPA, and RIDEM to ensure the continued protection of human health and the environment.

- Additionally, the ROD stated that signature of this ROD (EA 1999) constituted final documentation that the three former munitions bunkers have been closed appropriately as described in the Foster Wheeler Environmental Corporation (FWENC) Close-Out Report (FWENC 1997a).

2.1.4.1 Remedy Implementation

During August 2001, the LTMP was initiated with ME 01. LUCIP inspections were initiated on 23 May 2001. The deed, without the ELUR, was recorded on 17 October 2001.

2.1.4.2 System Operation/Operation and Maintenance

The section is not applicable to this site for which the remedy is LTM and LUCIP inspections.

2.1.5 Progress Since the Last Five-Year Review

This is the first five-year review for the site.

2.1.6 Five-Year Review Process

2.1.6.1 Administrative Components

Refer to Section 1.1

2.1.6.2 Community Involvement

Refer to Section 1.1.

2.1.6.3 Document Review

Documents reviewed are referenced in this Section 2.1 and the citations are included in the List of References.

2.1.6.4 Data Review

Based on the Institutional Control Inspections during ME 01 (20 August 2001) and ME 02 (20 May 2002), there was compliance with the institutional controls stated in the LUCIP (EA 2002g) for this parcel.

Only two sets of LTM sample data are available since the site investigations (Phase III RI [EA 1998a] and Remedy Design Hydrogeologic Investigation [EA 2002f]), including ME 01 (August 2001) and ME 02 (May 2002) ground-water samples from monitoring wells and piezometers, and sediment samples collected during ME 02 as reported in the related reports of ME 01 (EA 2002a) and ME 02 (EA 2002b). This database is too small to determine and evaluate trends in the detected concentrations. As per Section 6.3.1 of the QAPP (EA 2001a), statistical trend analysis of available time series of the site COC, including an evaluation of observed 95 percent statistically significant increasing and/or decreasing trends will be evaluated, once at least eight rounds of data become available.

VOC were not detected in the sediment samples collected during the May 2002 ME 02, indicating no related unacceptable risk to human health and the environment from sediment.

The ME 01 and ME 02 results of the ground-water samples collected from monitoring wells generally confirmed the nature and extent of the dissolved CVOC plume identified during the Phase III RI (EA 1998a). This is shown by the summary of the total CVOC detected in samples from the monitoring wells collected during the Phase III RI, the Remedy Design Hydrogeologic Investigation, ME 01, and ME 02 is illustrated in Figure 3A. Data for samples from wells MW07-33S/D/R and MW07-34D (installed after the Phase III RI) indicate that the CVOC plume extends to those areas (northwest corner and eastern portion of the site). Regarding the targeted inorganic analytes in the LTM QAPP (EA 2001a), only antimony was detected above the Project Action Level (PAL) (6 micrograms per liter [µg/L]) in 1 of 29 ground-water samples (MW07-09R at 7.6 µg/L) collected in May 2002. These LTM data indicate that the ground water continues to pose unacceptable risk to human health if used for drinking (ingested) or if used for showering (inhalation and dermal contact). The ground-water use restriction on the entire Parcel 9 precludes such exposures. Additional LTM data will be needed to statistically assess whether the CVOC plume is static, as assumed for the CLTMP (NewFields 2000a), or if it is still moving.

During ME 01 (August 2001), ground-water sample collection began from piezometers (screened 2-3 ft below ground surface [bgs]) located along the southern shoreline. The number of piezometer locations was more than doubled to include the western shoreline for ME 02 in May 2002. The ME 02 piezometer locations are shown in Figure 2 and a summary of the total CVOC detected in the samples is shown in Figure 3B. The ME 02 results indicated exceedance of the 1,1,2,2,-PCA PAL (‘trigger value’) (13.9 µg/L) at 7 locations along the entrance channel and southwestern point shorelines (ranging from 16 µg/L to 80 µg/L at P07-05, P07-07, P07-09, P07-10, P07-21 ,P07-22, and P07-23; Figure 2) and exceedance of the vinyl chloride PAL (3.78 µg/L) at 2 locations (ranging from 4 µg/L to 4.635 µg/L at P07-05 and P07-07,

respectively) (EA 2002a and EA 2002b). VOC were not detected in the sample from P07-01 located adjacent to the interior wetland indicating no plume discharge to that area. These PAL ('trigger values') were conservatively calculated for a carcinogenic human health risk of 10^{-6}. However, these data do not indicate the presence of unacceptable risk along the shoreline of the entrance channel and the western "cove" or the interior wetland because they are still cumulatively within the carcinogenic human health risk range of 10^{-5}-10^{-6}. The Navy will continue to evaluate new data from the shoreline piezometers following each monitoring event with respect to the risk range.

Areas of Non-Compliance

The LTM data indicate that the deep and bedrock ground water continues to pose unacceptable risk to human health if used for drinking (ingested) or for showering (inhalation and dermal contact). The ground-water use restriction on the entire Parcel 9 precludes such exposures.

The LTM data indicate that the shallow ground water (2-3 ft bgs) from 7 piezometer locations exceed two of the PAL. These PAL ('trigger values') were conservatively calculated for a carcinogenic human health risk of 10^{-6}. However, these data do not indicate the presence of unacceptable risk along the shoreline of the entrance channel and the western "cove" or the interior wetland because they are still cumulatively within the carcinogenic human health risk range of 10^{-5}-10^{-6}.

2.1.6.5 Site Inspections

The initial site LUCIP inspection occurred on 23 May 2001, and then such inspections occurred on 20 August 2001 and 20 May 2002 during ME 01 and ME 02, respectively. Based on these Institutional Control Inspections, there was compliance with the institutional controls stated in the LUCIP (EA 2002g) for this parcel.

2.1.6.6 Interviews

No interviews were conducted. However, during the January, March, and June 2002 Restoration Advisory Board (RAB) meetings, the community was informed of the five-year review process for the former NCBC Davisville facility, and copies of a related EPA handout were provided by EPA entitled "Focus on Five-Year Reviews and Involving the Community, Checking Up on Superfund Sites" (U.S. EPA 2001). Persons with related comments and/or information were asked to contact the EPA RPM and/or the Navy RPM. Notes of each RAB meeting are prepared and sent out to approximately 150 addressees on the NCBC Davisville community mailing list. A copy of the EPA handout was included with the notes of the January 2002 RAB meeting.

2.1.7 Technical Assessment

Question A: Is the remedy functioning as intended by the decision documents?

Based on the data reviewed and site inspections, the remedy is functioning as intended by the ROD. The ARAR review is summarized in Appendix B using the ARAR tables from the ROD modified with the first five-year findings. As stated in Section 2.1.6.4 (Data Review), the area of noncompliance regarding the quality of the ground water does not pose an unacceptable risk to human health because of the effective implementation of institutional controls, which have prevented exposure to, or ingestion of, contaminated ground water. Monitoring of ground water beneath the site and ground-water discharge near the entrance channel and harbor shorelines will continue to provide data to ensure that contaminated ground water from the site continues to pose no unacceptable risk to human health.

The addition of the ME 01 and ME 02 data have preliminarily indicated two data gaps to the understanding of the CVOC migration to the Allen Harbor shoreline area and whether the CVOC plume is migrating from the MW07-26S/MW07-27D area southwest toward MW0719/MW07-21 (entrance channel area) or toward the east. First, to refine the understanding of the conceptual site model (CSM), the hydrogeology, and the source for the CVOC detected in the May 2002 samples from piezometers located along the site shoreline with Allen Harbor and if those detected concentrations are typical or may increase/decrease, add five monitoring wells (MW07-35D, a shallow and deep overburden well pair at SB07-05, and a shallow and deep overburden well pair between MW07-04 and MW07-35). Second, to refine the understanding of the CSM and CVOC plume migration pathway in the central portion of the site (MW07-26S and MW07-27D vicinity), (e.g., is it southwest toward MW07-19 and MW07-221, or east), add three monitoring wells (MW07-27S, and a shallow and deep overburden well pair approximately 125–150 ft east of MW07-26S). The Navy is considering adding these wells after ME 04 if funding is available. Third, quantitatively refine the understanding of potential exposure to CVOC in the shallow ground water near the discharge area to the shoreline, add to ME 03 (February 2003) approximately 9 piezometer locations between P07-18 and P07-19 to cover the remaining portion of the harbor shoreline that had not previously been sampled (Figure 2). Additionally, the Navy is considering conducting additional studies and/or other evaluations in the shoreline environment in order to better identify areas where plume discharge has the potential to occur, and to optimize long-term monitoring locations accordingly

Question B: Are the exposure assumptions, toxicity data, cleanup values, and remedial action objectives (RAO) used at the time of the remedy selection still valid?

There have been no changes in the physical conditions of the site that would affect the protectiveness of the remedy.

No unacceptable risks for ecological receptors were identified earlier for Site 07. No circumstances have changed that might alter this conclusion; therefore, monitoring for the protection of ecological receptors continues to be not necessary.

Changes in Standards and To-Be-Considereds

Table 8-3 of the Final QAPP for the LTM of Site 07 (EA 2001a), NCBC Davisville, presents ground-water standards as PAL for ground water in monitoring wells at the site. These standards correspond to federal drinking water standards, Maximum Contaminant Levels (MCL), or state drinking water standards, whichever is more stringent. All values presented in Table 8-3 were reviewed for changes. Only one MCL has undergone revision since the Final QAPP was issued. The MCL for arsenic has been lowered from 50 µg/L to 10 µg/L with a compliance date effective in 2006. Therefore, the PAL for arsenic in ground water has been revised, and will be provided as a revised Table 8-3 in Revision No. 02 of the Final QAPP.

Changes in Exposure Pathways, Toxicity, and Other Contaminant Characteristics

No additional exposure pathways have been identified since those originally selected (Section 2.1.3.5, Basis for Taking Action).

A review of Appendix A of the CLTMP for Site 07, Trigger Values Computations Derivation of Surface Water Risk-Based Screening Concentrations for Site 07 Calf Pasture Point, NCBC Davisville (NewFields 2000a), reveals that published toxicity values (reference Doses [RfD] and cancer slope factors [CSF]) for several COC have been revised since the trigger values were calculated for shallow ground water near the discharge to surface water at the site. Additionally, revised EPA dermal guidance has been issued since this report was written, which impacts gastro-intestinal absorption factors and skin surface areas used for the recreational scenario. Finally, Appendix A (NewFields 2000a) shows separate risk calculations and Risk-Based Screening Calculations (RBSC) for the ingestion and dermal pathways. Current EPA guidance requires calculation of cumulative risks across pathways. Therefore, as required under EPA's Comprehensive Five-Year Review Guidance (OSWER No. 9355.7-03B-P, Appendix G Exhibit G-4), risks have been recalculated for the Site 07 CLTMP trigger values for shallow piezometer data.

Table H-3 (copy in Appendix B) presents the trigger values as presented in the CLTMP for Site 07. These values were used as Exposure Point Concentrations (EPC) in order to calculate risks from the current trigger values, using revised toxicity and exposure data, as specified in Exhibit G-4 of the EPA guidance for five-year reviews. Tables H-4.1 and H-4.2 (copies in Appendix B) present exposure assumptions used for the recreational adult and child. The only values that have been changed are those for exposed skin surface areas for both receptors. These values represent current EPA guidance. Tables H-5.1, H-5.2, and H-6.1 (copies in Appendix B) present non-cancer and cancer toxicity values used in recalculating risks for the current target piezometer values. All values are taken from the Integrated Risk Information System (IRIS) (U.S. EPA 2003). If no value is published on IRIS, then Health Effects Assessment Summary Tables (HEAST) (U.S. EPA 1999) or National Center for Environmental Assessment (NCEA) values were used.

Revised Risk Results

Tables H-9.1 and H-9.2 (copies in Appendix B) present the calculated risks for recreational adults and children, the trigger values for COC in surface water, utilizing updated toxicity and exposure values.

Recreational Adults

Cumulative cancer risks for all COC, using reasonable maximum exposure (ME) assumptions at their trigger value concentrations, result in risks which fall within EPA's acceptable risk range for recreational adults (Table H-9.1 in Appendix B). Cumulative cancer risks for each COC are less than except for arsenic, benzene and trichloroethene. For each of these COC, cumulative risks across pathways result in risks which fall within EPA's acceptable risk range for recreational adults. Exhibit G-4 in EPA's Five-Year Review Guidance states that if recalculated risks for the cleanup values result in risks that fall within the acceptable risk range, then no further analysis is required. Therefore, it is not necessary to derive new cleanup values for carcinogenic COC in surface water at Site 07.

Cumulative non-cancer risks for the recreational adult for each COC at its trigger value concentration are also presented in Table H-9.1 (copy in Appendix B). The cumulative non-cancer Hazard Index (HI) exceeds 1.0; however, there are no individual COC or target organs with cumulative HIs exceeding the risk target of 1.0. Therefore, it is not necessary to derive new cleanup values for non-carcinogenic surface water COC at Site 07.

Recreational Children

Cumulative cancer risks for all COC, using ME assumptions at their trigger value concentrations, result in cumulative risks which fall within EPA's acceptable risk range for recreational children (Table H-9.2 in Appendix B). Cumulative cancer risks for each COC are less than 10^{-6}, except for trichloroethene. Cumulative risks across pathways for trichloroethene result in risks which fall within EPA's acceptable risk range for recreational children. Therefore, it is not necessary to derive new cleanup values for carcinogenic surface water COC at Site 07.

Cumulative non-cancer risks for the recreational child for each COC at its trigger value concentration are also presented in Table H-9.2 (copy in Appendix B). The cumulative non- cancer HI exceeds 1.0; however, there are no individual COC or target organs with cumulative HIs exceeding the risk target of 1.0. Therefore, it is not necessary to derive new cleanup values for non-carcinogenic surface water COC at Site 07.

Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

No weather-related events have affected the protectiveness of the remedy. No other information has come to light that could call into question the protectiveness of the remedy. However, the addition of the ME 01 and ME 02 data have preliminarily indicated two data gaps to the understanding of the CVOC migration, which are planned to be addressed by the installation of additional LTM wells and piezometer locations.

Technical Assessment Summary

Based on the data reviewed and site inspections, the remedy is functioning as intended by the ROD. There have been no changes in the physical conditions of the site that would affect the protectiveness of the remedy.

One MCL (arsenic) was changed and has, accordingly, been updated in the LTMP and it is not expected to have a negative impact on the remedy. The toxicity data for some of the COC have changed. However, assessment of those changes indicates that it is not necessary to derive new cleanup values for Site 07.

No other information has come to light that could call into question the protectiveness of the remedy. However, the addition of the ME 01 and ME 02 data have preliminarily indicated two data gaps to the understanding of the CVOC migration, which are planned to be addressed by the installation of additional LTM wells and piezometer locations.

Based on the data reviewed and site inspections, the remedy is functioning as intended by the ROD, as modified by the Explanation of Significant Difference (ESD).

There have been no changes in the physical conditions of the site that would affect the protectiveness of the remedy. The ARAR related to implementation of the remedy were met. The toxicity values, exposure assumptions, preliminary remediation goals (PRG) values, and RAO used at the time of the remedy selection are still valid. Although there was one change in standards, the MCL for arsenic, it is not expected to have a negative impact on the remedy. There is no other information that calls into question the protectiveness of the remedy.

2.1.8 Issues

Issue	Currently Affects Protectiveness (Y/N)	Affects Future Protectiveness (Y/N)
Additional data needed to refine the CSM, the understanding of the hydrogeology from source area(s) southwest to the harbor 'cove' area and CVOC plume migration in central portion of the site.	N	Y
The Environmental Land-Use Restriction (ELUR) has not yet been recorded.	N	Y

2.1.9 Recommendations and Follow-Up Actions

Issue	Recommendations / Follow-Up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness? Y/N	
					Current	Future
Additional data to refine CSM	1) For southwest extent from source: add five monitoring wells (MW07-35D, a shallow and deep overburden well pair at SB07-05, and a shallow and deep overburden well pair between MW07-04 and MW07-35). This would be dependent on a availability of Navy funds.	Navy	EPA / RIDEM	8/31/03	N	Y
	2) For plume migration in central portion of the site: Add three monitoring wells (MW07-27S, and a shallow and deep overburden well pair approximately 125-150 ft east of MW07-26S). This would be dependent on availability of Navy funds.			8/31/03	N	Y
	3) To expand quantitative understanding of the harbor shoreline: add to ME 03 (February 2003) approximately 9 piezometer locations between P07-18 and P07-19 to cover the remaining portion of the harbor shoreline that had not previously been sampled (Figure 2).			3/7/03	N	Y
Recording of ELUR	Work with the Town to expedite recording of the ELUR.	Navy	EPA / RIDEM	10/31/04	N	Y

2.1.10 Protectiveness Statement

A protectiveness determination of the remedy at Site 07 cannot be made at this time until further information is obtained. Site 07 LTM plan states that 8 rounds of sampling will be completed prior to determining the protectiveness of the remedy. As of this date, 3 rounds of sampling have been completed. It is estimated that the 8 rounds of sampling will be completed by November 2006, at which time a protectiveness statement will be made. Based on the reviewed data, the Site 07 remedy is expected to be protective of human health and the environment as long as the institutional controls remain in place as implemented through the LUCIP, and in the interim, the exposure pathways that could result in unacceptable risk are being monitored, including consideration of conducting additional studies and/or other evaluations in the shoreline environment in order to better identify areas where plume discharge has the potential to occur, and to optimize long-term monitoring locations accordingly.

2.1.11 Next Review

The next five-year review for the former NCBC Davisville facility that includes Site 07 is required by March 2008, five years from the date of this review.

2.2 SITE 09 ALLEN HARBOR LANDFILL

2.2.1 Site Introduction

Refer to Section 1.1 for description of the purpose of the five-year review

2.2.2 Site Chronology

The following presents the chronology of site events:

- 1946-1972 – Allen Harbor Landfill was used for the disposal of waste material generated by the former NCBC Davisville facility and NAS Quonset Point.
- 1972 – After landfilling operations had ceased, the landfill was closed in accordance with standard practice at the time by placing a 2-ft soil cap over the fill materials.
- September 1984 – Completion of the Initial Site Assessment of the former NCBC Davisville facility (Hart 1984).
- February 1987 – Completion of the Verification Step -Confirmation Study of the former NCBC Davisville facility (TRC 1987).
- 1989 – EPA's Hazard Ranking Scoring Package for the former NCBC Davisville facility.
- 21 November 1989 – NCBC Davisville facility placed on the CERCLA NPL.
- March 1992 – FFA signed by the Navy, EPA, and the State of Rhode Island.
- December 1996 – Remedial Investigation completed (EA 1996a).
- 29 September 1997 – ROD signed (EA 1997).
- 31 March 1998 – Submittal of Final Design Analysis Report For Closure of the Allen Harbor Landfill (EA 1998c) and landfill capping activity begins.
- August 1999 – Landfill capping activity completed and ESD submitted for polychlorinated biphenyls (PCB)-contaminated soil removal and extension of the soil cap and the revetment.
- 30 March 2000 – Initiation of quarterly physical inspections of the landfill.
- June 2000 – Final Remedial Action Report for Site 09 – Allen Harbor Landfill Cap (FWENC 2000b).

- November 2000 – Class I survey of Parcel 10 completed and annotated with references to the deed for ground-water use and land-use restrictions.

- 22 December 2000 – Final CLTMP which included establishment of the performance standards (NewFields 2000b).

- 14 December 2000 – FOST to transfer the property (Parcel 10) to the US. Department of Interior for transfer to the Town of North Kingstown, Rhode Island (U.S. Navy 2000). The FOST includes the ELUR required by the ROD and deed covenants.

- May 2001 – Final Remedial Action Operations and Long-Term Management Plan for Allen Harbor Landfill (FWENC 2001).

- July 2001 – Work Plan Addendum No. 2 and Installation of MW09-25S as agreed to in the CLTMP.

- October 2001 – Final Landscape Plan for Allen Harbor Landfill (Beckman-Weremay 2001).

- November 2001 – Final Quality Assurance Project Plan for LTM of Site 09 (EA 2001e).

- 30 November 2001 – LTMP initiated with ME 01.

- January 2002 – Final LUCIP that includes the inspection procedures for Site 09 to document compliance with the land-use controls and/or deed covenants placed by the Navy on this transferred Navy property (Parcel 10) (EA 2002g).

2.2.3 Background

2.2.3.1 Physical Characteristics

Site 09 is located in the Main Center of the former NCBC Davisville facility and within Parcel 10 (Figures 1, 4, and 5). Currently, the site is an approximately 15-acre, grassy area formerly used by the Navy as a landfill. The site is located within a 100-year floodplain and is bounded to the east by Allen Harbor, to the west by Sanford Road, and to the north and south by vegetated wetlands. Allen Harbor is used for recreational boating and is supported by two marinas. In 1984, RIDEM closed Allen Harbor to shellfishing due to suspected contamination by several sources, including Site 09.

The ground surface of the site is currently covered with grass and small shrubs. In general, the terrain at Site 09 is gently sloping with a topographic high in the middle. A revetment wall and constructed wetland are located along the southern and eastern boundary of the landfill with a stone breakwater structure separating the wetland from the harbor.

Based on water level measurements in 18 of the 20 LTM wells at the site during the mid-tide stage, ground water in the shallow overburden and fill material is interpreted to flow generally toward the nearest shoreline (south in the southern portion of the site and east in the eastern portion of the site (EA 2002c, EA 2002d, EA 2002e, and EA 2003b), while ground water in the deep overburden is interpreted to flow generally east to southeast. Additionally, based on these sets of LTMP water level measurements, it appears as though the water table in the shallow overburden and fill material has decreased approximately 0.5 ft (MW09-20I) to 3.3 ft (MW09-17I) since April 1995 (during the Phase III RI; prior to construction of the landfill cap). However, it must be noted that the water level database is very small, so it is not possible to determine if this water level decrease is due to the effect of the landfill cap mitigating rainfall infiltration and/or if it is just seasonal variations, or if the local water levels are just naturally lower during the LTMP measurement times.

During construction of the landfill cap, the ground surface of the site was regraded and increased in elevation in many areas. This resulted in the extension of most of the LTM wells to the final grade of the landfill cap. During redevelopment of the LTM wells prior to initiating the LTMP, 8 of the planned 20 LTM wells were found to be damaged, apparently during the cap construction activity (perhaps due to the weight of the heavy machinery used at the site and/or being inadvertently hit by that machinery). The damage was assumed when the pump used for the redevelopment process could not be placed to the bottom of the well or when traces of filter sand were discharged or observed on the pump when it was retrieved. Four of these wells appear to be damaged above the ground-water level (MW09-08S, MW09-20I, MW09-23S, and MW09-24S). MW09-14D may be damaged within the screened interval. MW09-23D may be damaged approximately 45 ft below grade (10 ft above the screened interval). Because the damage to these 6 wells was not anticipated to seriously impact the representativeness of water samples collected from them, they were tentatively retained in the LTMP. The remaining 2 of these LTM wells (MW09-09D and MW09-14I) are damaged such that even the intake for the peristaltic sampling pump could not be lowered to a depth within the screened interval and so can not be sampled. MW09-09D appears to be damaged just below the water table and MW09-14I is damaged above the water table (21.1 ft below the top of the riser pipe). During the 8 November 2001 BRAC Cleanup Team (BCT) Meeting, it was agreed that decisions regarding the replacement of damaged wells and/or the installation of additional monitoring wells would be delayed for two years pending the collection and assessment of monitoring data (through ME 08) during that time, including probable changes resulting from capping of the landfill. Sampling of the 18 accessible LTM wells has been by peristaltic pump (EA 2001e).

2.2.3.2 Land and Resource Use

The historic (1946 to 1972) land use of the site was as the Allen Harbor Landfill for the disposal of waste material generated by NCBC Davisville and NAS Quonset Point. Currently, the site is undeveloped property with a grass and small shrub ground surface cover over the multimedia cap of the landfill. Parcel 10, which includes Site 09, is in the process of being transferred from the Navy to the Town of North Kingstown via the U.S. Department of Interior. Site 09 will not be used for residential purposes in the future due to environmental land use restrictions required by

the remedy and because the Town's planned use of the property is as open space/conservation land.

No ground-water production wells are located on, or downgradient of, the site. Ground water at the site is classified by RIDEM as GB (i.e., presumed to be not suitable for public or private drinking water use without treatment).

In accordance with the LUCIP (EA 2002g), Parcel 10 includes the following environmental land-use restrictions:

- That the entire parcel is used only for park and recreational uses, not for residential or commercial use, as stated in the ROD.

- For the entire parcel, water supply wells shall not be installed, nor shall ground water be utilized except for sampling or other remedial purposes.

- That the contaminated site as delineated on Figure 5 (land-use restriction boundary) is used by the Grantee, its successors, and assigns, for pedestrian traffic only. Restrictions include, but are not limited to: digging, use of motorized vehicles, or other activities that may damage the remedy components (multimedia cap, gas vents, monitoring wells, stone revetment, etc.) or otherwise allow direct exposure to hazardous waste under the cap.

LUCIP inspections of Parcel 10 are performed in conjunction with each Site 09 ME, but no less frequently than annually, to document that there has been no variance from the environmental land-use restrictions stated above.

The purpose of the environmental land-use restrictions is to ensure:

- That the entire parcel shall be used for only park and recreational uses, not for residential or commercial use, as stated in the ROD.

- That ground water for the entire parcel shall not be withdrawn or utilized except for sampling or other remedial purposes.

- That the Contaminated Site as delineated on Figure 5 ('land-use restriction boundary') is used by the Grantee, its successors, and assigns, for pedestrian traffic only. Restrictions include, but are not limited to: digging, use of motorized vehicles or other activities that may damage the remedy components (multimedia cap, gas vents, monitoring wells, stone revetment, etc.) or otherwise allow direct exposure to hazardous waste under the cap.

2.2.3.3 History of Contamination

A 1939 aerial photograph of the Allen Harbor area depicts the landfill as an undeveloped open grass field rimmed with shrubs and bushes. From 1946 to 1972, the Allen Harbor

Landfill was used for the disposal of waste material generated by NCBC Davisville and NAS Quonset Point. Reportedly, a variety of waste, including municipal-type waste, construction debris, rubble, preservatives, paint thinners, degreasers (e.g., solvents), PCB, oil, asbestos, ash, sewage sludge, and waste fuel oil were disposed of in the landfill. Disposal activities usually included burning the waste and covering it with soil. In 1972, after landfilling operations had ceased, the landfill was closed in accordance with standard practice at the time by placing a 2-ft soil cap over the fill materials. Prior to construction of the cap portion of the site remedy (in 1998), the site was vegetated similar to typical upland coastal areas (i.e., grasses/perennials, shrub communities, and deciduous forest components) which provided habitat for numerous species of birds and mammals. Also, building debris and rusted metallic objects were visible at various locations across the site, including the site shoreline and harbor-side face of the landfill prior to implementation of the remedy in 1998.

2.2.3.4 Initial Response

In 1972, after landfilling operations had ceased, the landfill was closed in accordance with standard practice at the time by placing a 2-ft soil cap over the fill materials.

2.2.3.5 Basis for Taking Action

Ground-water data from the RI indicated the presence of elevated concentrations of VOC and low concentrations of PAH, pesticides, and metals. Elevated concentrations of PAH, pesticides, PCB, and metals were detected in surface and subsurface soil samples. Semi-volatile organic compounds (SVOC), pesticides, PCB, and metals were detected in sediment samples throughout the Harbor.

Contaminants (cancer risk > 10^{-4} and/or HI>1)

Ground Water
Arsenic
Manganese
Bis(2-chloroethyl)ether
1,2-Dichloroethane
1,2-Dichloroethene (total)
1,2-Dichloropropane
TCE
Vinyl chloride

Sediment
Heavy metals
PAH
PCB

Shellfish
Arsenic

Copper
Zinc
Aroclor 1254
Aroclor 1260

The identified human health risks at Site 09 are associated with the potential ingestion of deep ground water by future residents, the use of site ground water for showering in a potential recreational facility, dermal contact with or incidental ingestion of site surface soil by recreational users of the site, incidental ingestion of shoreline sediment by recreational users of the site, and consumption of shellfish from the site shoreline. Potential health risks to site workers during remedial activities are associated with the incidental ingestion of soil. Ecological risks to marine organisms in Allen Harbor were reported to be "moderate" to "slight." Moderate risk to marine organisms was reported to be limited to the narrow intertidal zone to the north and south of the site. Risks to terrestrial ecological receptors were reported to be moderate to high within the Allen Harbor Watershed (an area in which the Allen Harbor Landfill was one of the contributors to elevated risk).

The use of site ground water for drinking or showering is not considered to be a viable exposure scenario based on the planned use as open space/conservation land by the Town of North Kingstown. The Rhode Island ban on shellfishing in Allen Harbor addresses the reported human health risk for ingestion of shellfish from the shoreline of the Allen Harbor Landfill. Construction of an impermeable, multimedia and soil cap at Site 09, as summarized below, prevents human and terrestrial animal contact with site surface soil/fill material, reduces runoff and erosion of fill material, and reduces the potential leaching of COC from fill materials caused by precipitation infiltration.

2.2.4 Remedial Actions

The ROD for Site 09 was signed 29 September 1997 and presents the selected whole-site remedy for Site 09 (EA 1997) including the construction of a multimedia cap (including a gas venting system), stone shoreline revetment, an offshore breakwater, and the construction of intertidal wetlands, along with LTM and land-use controls. The Navy concluded that the selected remedial action would protect human health and the environment.

As stated in the ROD, the Remedial Action Objectives (RAO) for Site 09 are as follows:

- Surface Soil
  - — Prevent human and terrestrial animal exposure to COC in surface soil
  - — Prevent offsite migration of surface soil and surface soil constituents through overland runoff
- Subsurface Soil
  - — Reduce leachate generation

— Reduce or eliminate surface erosion and exposure of fill materials along landfill shoreline

- Ground Water

  — Prevent human exposure to COC in deep ground water

- Sediment

  — Minimize risks from marine ecological exposure to COC in sediment
  — Control potential future sediment contamination from landfill constituents

- Wetlands

  — Control potential future contamination of wetlands from landfill constituents
  — Improve quality of existing wetlands and create new wetlands onsite along the shoreline

- Shellfish

  — Control potential future contamination of shellfish from landfill constituents
  — Prevent or minimize human ingestion of shellfish from the landfill shoreline containing COC above health advisory concentrations.

Based upon the results of the Remedial Investigation/Feasibility Study (RI/FS), and the community response to the Proposed Plan, the selected remedy for Site 09 was Alternative 3 – Multimedia Cap. A complete description of the selected alternative is presented in Section VIII of the ROD (EA 1997) and in the ESD of August 1999. The selected remedial alternative is a whole-site remedy, which was planned to be protective of human health and the environment.

The EPA's Presumptive Remedy for CERCLA Municipal Landfill Sites directive (OSWER Directive 9355.0-49FS) states that containment technologies are the preferred remedies for municipal-type landfill waste. Accordingly, cleanup goals (i.e., treatment goals) were not developed as part of the Site 09 remedy. The components of the selected alternative address the identified risk pathways and RAO identified for Site 09. The LTM program established as part of the selected alternative will ensure the protection of human health and the environment over time. The selected remedial alternative includes the following components:

- Construction of a Multimedia Cap above the 14-ft MSL 100-year storm elevation, that consists of multiple soil layers and two impermeable layers, and a soil cap in the area below 14 ft MSL to comply with current federal and state laws. This addressed the RAO for surface and subsurface soil.

- Landfill gases collected within the gas vent layer passively vented to the atmosphere via five vents at Site 09. The points of discharge (vents) were fenced in order to protect potential site visitors.

- Removal and/or covering of landfill debris from the site shoreline. This addressed the RAO for surface soil and sediment.

- Construction of a stone revetment along the shoreline of Site 09 to protect the landfill face from wave action (e.g., tidal forces and storm events). This stabilization of the landfill face addressed the RAO for surface soil and sediment.

- The ESD extended the remedial action under the selected remedy as follows (addressing the RAO for surface and subsurface soil, and sediment in the north portion of the site):

  — Excavation of soil with detected PCB concentrations greater than the cleanup objectives

  — Disposal of soil offsite

  — Placement of a soil cover over areas with soil contamination below cleanup objectives

  — Extension of the shoreline protection (revetment) further north and adjacent to this area.

- Construction of a breakwater structure just east of a majority of the revetment wall, along with construction of a wetland area between the revetment wall and breakwater structure, which together act to trip waves and reduce energy reaching the revetment. Construction of this wetland area along the shoreline of the site also serves as a natural resources/habitat improvement and used material dredged from the entrance channel to Allen Harbor. The progression of wetland development is being monitored over time to determine the feasibility of sustainability. This addressed the RAO for sediment and wetlands.

- Establishment of institutional controls as follows (addressing the RAO for ground water):

  — Implementation of land-use restrictions that include deed restrictions regarding site and ground-water use

  — Implementation of appropriate land-use restrictions (no use of motorized vehicles, no digging, no deep-rooted vegetation) to protect human health and the environment through limiting site development to maintain the integrity of the cap

  — Prevention of the installation or use of ground-water wells, which would be used for drinking water or showering purposes.

- Conduct LTM of landfill gas, ground water, sediment, and shellfish quality to evaluate the effectiveness of the remedy.

- Five-year reviews of the decision for the site by the Navy, EPA, and RIDEM.

2.2.4.1 Remedy Implementation

On 31 March 1998, the Final Design Analysis Report for Closure of the Allen Harbor Landfill (EA 1998c) was submitted and the capping activity begun. FWENC completed the remedial action in August 1999 (FWENC 2000b). In addition to the remediation activities outlined in the ROD, a removal action was performed by FWENC in the Spring of 1999 when the presence of PCB-contaminated soil was discovered in an area just beyond the northern end of the landfill. Due to the PCB removal conducted as part of the remedy for this site, an ESD was submitted as part of the ROD in August 1999. The ESD did not fundamentally alter the remedy at the site. The ESD included the PCB-contaminated soil removal and a northerly extension of the soil cap and the revetment. On 30 March 2000, quarterly physical inspection of the landfill was initiated. On 30 November 2001, LTMP and LUCIP inspections were initiated with ME 01.

2.2.4.2 System Operation/Operation and Maintenance

Operation and maintenance activities at the Allen Harbor Landfill are performed quarterly for the first two years and then semi-annually for the next 28 years in accordance with the Final Remedial Action Operations and Long-Term Management Plan (FWENC 2001). Operation and maintenance, or post-closure care, at the Allen Harbor Landfill must be performed for 30 years after the landfill closure in accordance with Resource Conservation and Recovery Act (RCRA) requirements in 40 CFR Parts F, G, and N, Section 2.1.09(c) of the RIDEM Office of Waste Management Solid Waste Regulation No. 2 – Solid Waste Landfills, and the ROD. The LTMP is performed in accordance with the Final QAPP (EA 2001e). A copy of the template for the site physical inspection report (checklist) is provided as Table 6-2 in the Final QAPP (EA 2001 e). A copy of the Institutional Control Inspection Checklist for this site is provided in the Final LUCIP (EA 2002g).

The primary activities associated with operation and maintenance of the site include:

- Visual inspection of the landfill cap with regard to vegetative cover, settlement, erosion, and need for corrective action.

- Inspection of the storm drainage system for sediment accumulation, erosion, vegetative growth, ponding, and obstructions.

- Inspection of the condition of the gas vents and monitoring wells.

- Inspection of the revetment slope and breakwater structure for areas of sliding or stone displacement.

- Inspection of the constructed wetland, the planted wetland in the former barge area just north of the capped area, and the wetland enhancement area located along the northwest comer of Allen Harbor for plant percent survivability, physical appearance, density of growth, and presence of invasive wetland plant species.

- Inspection of shellfish in the constructed wetland regarding presence (establishment of a population), general location, extent, and abundance of ribbed mussels, hard or soft-shell clams, and oysters.

Based on the Institutional Control Inspections during ME 01 (30 November 2001), ME 02 (25 February 2002), ME 03 (3 June 2002), and ME 04 (3 September 2002) there was compliance with the institutional controls stated in the LUCIP (EA 2002g) for this parcel. Copies of the related institutional control inspection checklist are included in each of the related monitoring event reports (EA 2002c, EA 2002d, EA 2002e, and EA 2003a), and the LUCIP 2001 and 2002 Annual Letter Reports (EA 2002i and EA 2003a).

Based upon the landfill inspections during 2000, 2001, and 2002, it appears that overall the site remedy was in good condition and functioning according to design, including the cap, revetment slope, and breakwater structure. Based on survey results, there has been minor subsidence in a few areas, but this has not exceeded the acceptable range of 6 in. over any 100 linear ft area of the landfill cap. A summary of these findings is provided in the annual summary letter reports of the Site 09 inspections for 2000 and 2001 (EA 2002h and EA 2002j). The wetland vegetation appears to be growing well in the barge removal area, the wetland enhancement area (located just north of the site), and in the northern portion of the constructed wetland. However, the southern portion of the constructed wetland is characterized by less than 1 percent vegetative cover. A shellfish population has not yet been established in the created wetland area. A few of the monitoring wells were identified as needing minor surficial repairs that were completed during October 2002. Additionally, two monitoring wells (MW09-14I and MW09-09D) need to be evaluated regarding potential abandonment and replacement (refer to the last paragraph of Section 2.2.3.1 for related detail). No conditions have been observed that would indicate negative impact on the integrity of the remedy. Identified minor maintenance needs that do not impact the integrity of the remedy will be addressed by the Navy in Summer 2003 including:

- Repair of rutting in the LTMP dirt access roads

- Removal of vegetation from drainage pipe outlets and the southern drainage swale

- Re-seeding of bare spots on the cap surface

- Installation of additional geotextile over the area east of piezometer P09-03 where there appears to be some channeling of tidal waters through the breakwater structure

- Repair of the small sections of exposed geotextile fabric along the top and toe of the revetment and the breakwater structure

- Removal of two large shrubs in the vicinity of gas vent GV09-05 as a precaution so their roots do not impact the multimedia cap

- Assess whether or not replanting of the southern portion of the constructed wetland is appropriate.

- Assess whether or not to replace damaged monitoring wells and/or consider adding wells to the monitoring network (after evaluation of the ME 08 sample results by 31 December 2004).

2.2.5 Progress Since the Last Five-Year Review

This is the first five-year review for the site.

2.2.6 Five-Year Review Process

2.2.6.1 Administrative Components

Refer to Section 1.l.

2.2.6.2 Community Involvement

Refer to Section 1.1.

2.2.6.3 Document Review

Documents reviewed are referenced in this Section 2.2 and the citations are included in the List of References.

2.2.6.4 Data Review

Only four sets of LTM sample data are available since the site investigations, including ME 01 (December 2001-January 2002), ME 02 (March 2002), ME 03 (June 2002), and ME 04 (September 2002) ground-water samples from monitoring wells and piezometers and sediment samples as reported in the related reports of ME 01 (EA 2002c), ME 02 (EA 2002d), ME 03 (EA 2002e) and ME 04 (EA 2003b). This database is too small to determine and evaluate trends in the detected concentrations. As per Section 6.3.1 of the QAPP (EA 2001a), statistical trend analysis of available time series of the site COC, including an evaluation of observed 95 percent statistically significant increasing and/or decreasing trends will be evaluated, once at least eight rounds of data become available.

Based on the landfill gas vent samples and gas flow rate measurements collected during ME 04, none of the VOC detected in the samples would exceed the PAL. SVOC were not detected in the gas vent samples. Field measurements for methane were up to 100 parts per million (ppm) approximately 1 ft below grade at some of the gas probe locations around the edge of the

multimedia capped area and 0.0 ppm along the perimeter of the landfill, well below the PAL of 500 ppm. The locations of the gas vents are shown on Figure 4.

Except for an approximately tenfold higher concentration detected in seven CVOC in the MW09-20I sample from ME 03, the ME 01 through ME 04 results of the ground-water samples collected from monitoring wells generally confirmed the nature and presence of the contamination identified during the Phase II and III RIs, including the probable presence of residual dense non-aqueous phase liquid (DNAPL) sorbed to soil or as ganglia between soil grains in the vicinity of MW09-20I (TRC 1994 and EA 1996a, respectively); i.e., the main analytes detected are CVOC. A summary of the constituents detected at concentrations exceeding the PAL is provided in Table 1. The 4 sets of LTMP data do not indicate the presence of obvious trends, except an apparent decrease in the chlorobenzene at MW09-11S and an apparent decrease in the trichloroethene and cis-1,2-DCE at MW09-21D, although there are insufficient sets of data available to statistically confirm this. Although the concentration of total CVOC detected in samples from MW09-20I during these four monitoring events ranges from 622,555 µg/L to 675,404 µg/L (922,200 µg/L at ME 03) versus 380,500 µg/L in the 1995 sample for the Phase III RI, there is an insufficient database for 1995 to know if that result was typical or anomalously low or high. These LTM sample data indicate that the ground water continues to pose unacceptable risk to human health if used for drinking (ingested) or if used for showering (inhalation and dermal contact). The ground-water use restriction on the entire Parcel 10 precludes such exposures.

The ME 01, ME 02, ME 03, and ME 04 results of the ground-water samples collected from piezometers (screened 2-3 ft bgs) located in the constructed wetland and along the shoreline indicate exceedance of some of the PALS as summarized in Table 2. The locations of the piezometers are shown on Figure 4. However, because of the very poor yields from these piezometers and their location in an inter-tidal zone, sample volumes could not be collected for all aliquots needed for the planned analytical program. Based upon the field-measured salinity of water from the piezometers and the results of a few samples that were laboratory analyzed for salinity (Table 3), it appears that the water collected from at least piezometers P09-02 through P09-08 (located within the constructed wetland) may be mostly harbor water (i.e., salinity greater than 20 parts per thousand [ppth]) draining out through the wetland after the previous high tide stage and, therefore, not representative of ground water from the site. Additionally, the wide variability in the data between monitoring events shown in Table 2 may better support variations from mostly recycled harbor water than a more consistent concentration that could be expected from slowly discharging ground water. However, the VOC results of the samples from P09-08B (new location selected for P09-08 downgradient of MW09-20I during ME 04) and P09-10 suggest that at least a portion of the water collected from at least these two locations is ground water from the site, although there is not a sufficient database to statistically confirm this. Because the sample aliquot types collected from the piezometer locations has varied both from location to location and between monitoring events, these data are currently inconclusive regarding the potential site discharge to this area. The Navy plans to add additional piezometers to each of these 10 locations. Additionally, although dissolved metals are often detected at concentrations above the PAL in ground-water samples from the piezometers (Table 2), they are not typically detected at concentrations above the MCL in ground-water samples from

monitoring wells within the site (Table 1); i.e., the detected dissolved metals concentrations are higher at the piezometer locations than just upgradient in the landfill. The possibility that much of the water collected from the piezometers may be recycled harbor water from the previous high tide stage will be assessed after collection of 8 monitoring events of data.

The ME 01 through ME 04 results of the sediment samples indicated inconsistent exceedance of PAL for only a few constituents in a few locations (Table 4):

- 4,4'-DDE (ME 03, SED09-09 at 9.5 micrograms per kilogram (µg/kg) versus 7.65 µg/kg for the PAL)
- 4,4'-DDT (ME 01, SED09-01 at 62J µg/kg versus 6 µg/kg for the PAL)
- Alpha-chlordane (ME 03, SED09-01 at 21 µg/kg versus 6 µg/kg for the PAL)
- Total PCB (ME 01, ME 02, and ME 04 for SED09-01 at 1,600 µg/kg, 220 µg/kg, and 910 µg/kg, respectively, versus 215 µg/kg for the PAL)
- Eight PAH (ME 04, SED09-10 overall 77,260 µg/kg versus the 44,792 µg/kg PAL for total PAH).

The small number of compounds detected and the inconsistent detections of these analytes across the area sampled do not support a protectiveness problem in sediment at this time. Only three pesticides have been detected in sediment at concentrations above their PAL (4,4'-DDE; 4,4'-DDT; and alpha chlordane) once each and during only one ME. In comparison, only trace amounts of one of these pesticides (4,4'-DDT) has been detected in ground-water samples from monitoring wells located upgradient within the landfill (MW09-14D at 0.0075 µg/kg and MW09-20D at 0.071J µg/kg) both of which are screened in the deep zone near the base of the silt unit and neither of which is close to the SED09-01 location where 4,4'-DDT was detected once above the PAL. The site data indicate that ground water from the landfill does not appear to be negatively impacting the sediment. However, continued assessment of the P09-01 and P09-10 locations (outside the constructed wetland area) and ground-water flowpaths are appropriate to build a database from which statistical analysis could be performed if necessary to determine if there is unacceptable risk to the environment. The presence of PCB at the P09-01 location is not unexpected, because it is in the vicinity of the PCB soil removal action of Spring 1999 and the concentrations detected at P09-01 (220 µg/kg–1,600 µg/kg) except for one sample have been below the removal action goal of 1,000 µg/kg. The elevated concentration of 8 PAH detected in the SED09-10 sample from ME 04 is the first PAH exceedance in a sediment sample during the first four monitoring events and suggests the presence of a localized remnant (approximately 2-3 ft bgs) of the historical activity at the site.

Areas of Non-Compliance

These LTM data indicate that the ground water continues to pose unacceptable risk to human health if used for drinking (ingested) or for showering (inhalation and dermal contact). The ground-water use restriction on the entire Parcel 9 precludes such exposures.

Except for the VOC detected at P09-10 and P09-08B, the results of the water sample from piezometers are inconclusive regarding the amount of their representativeness of discharge from the landfill verses recycled harbor water from a previous high tide stage.

The PAH and PCB exceedances in sediment (SED09-10 and SED09-01, respectively) may be localized remnants of the historical activity at the site. However, the PCB detections are in the vicinity of the soil removal action of Spring 1999 and the concentrations detected at P09-01 (220 µg/kg–1,600 µg/kg) except for one sample have been below the removal action goal of 1,000 µg/kg.

2.2.6.5 Site Inspections

Refer to Section 2.2.4.2.

2.2.6.6 Interviews

No interviews were conducted. However, during the January, March, and June 2002 Restoration Advisory Board (RAB) meetings, the community was informed of the five-year review process for the former NCBC Davisville facility, and copies of a related EPA handout were provided by EPA entitled "Focus on Five-Year Reviews and Involving the Community, Checking Up on Superfund Sites" (U.S. EPA 2001). Persons with related comments and/or information were asked to contact the EPA RPM and/or the Navy RPM. Notes of each RAB meeting are prepared and sent out to approximately 150 addressees on the NCBC Davisville community mailing list. A copy of the EPA handout was included with the notes of the January 2002 RAB meeting.

2.2.7 Technical Assessment

Question A: Is the remedy functioning as intended by the decision documents?

The review of documents, ARAR, risk assumptions, and the results of site inspections do not indicate that the remedy is not functioning as intended by the ROD. Assessment of the ARAR is provided in Appendix C (using the ARAR tables from the ROD modified with the first five-year findings) and indicates that although there have been some minor changes since the ROD was signed, they do not have a significant impact on the site remedy. A change in the MCL for arsenic is noted below, but only results in a change to the related PAL in the Final QAPP (EA 2001e) and will be added in Revision No. 01 to the QAPP. Detections above this revised PAL for ground water have been few (Table 1) and so the related impact on the remedy is negligible. As stated in Section 2.1.6.4 (Data Review), an area of noncompliance regarding the quality of the ground water does not pose an unacceptable risk to human health because of the

effective implementation of institutional controls which have prevented exposure to, or ingestion of, contaminated ground water as planned. Additionally, the landfill gas sample results indicate that that portion of the remedy is being protective as planned.

Except for the VOC detected at P09-10 and P09-08B, the results of the water samples from piezometers are inconclusive regarding the amount of their representativeness of discharge from the landfill versus recycled harbor water from a previous high tide stage.

The PAH and PCB exceedances in sediment (SED09-10 and SED09-01, respectively) may be localized remnants of the historical activity at the site. However, the PCB detections are in the vicinity of the soil removal action of Spring 1999 and the concentrations detected at P09-01 (220 µg/kg–1,600 µg/kg) except for one sample have been below the removal action goal of 1,000 µg/kg. The elevated PAH detections at SED09-10 are located 2–3 ft bgs, and therefore, there is not a risk of direct contact with the material.

Monitoring of ground water beneath the site and ground-water discharge near the harbor shoreline, plus sediment and landfill gas, will continue to provide data to assess the condition of the site regarding risk to human health and the environment. Remedy-required institutional controls are currently being implemented through the LUCIP and in the future through the LUCIP and the ELUR.

Question B: Are the exposure assumptions, toxicity data, cleanup values, and remedial action objectives (RAO) used at the time of the remedy selection still valid?

Changes in Standards and To-Be-Considereds

Table 8-2A of the QAPP for the LTM of Site 09 (EA 2001e), NCBC Davisville, presents ground-water standards as PAL for ground water in monitoring wells at the site. These standards correspond to federal drinking water standards, MCL, or state drinking water standards, whichever is more stringent. All values presented in that Table 8-2A were reviewed for changes. Only one MCL has undergone revision since the Final QAPP was issued. The MCL for arsenic has been lowered from 50 µg/L to 10 µg/L with a compliance date effective in 2006. Therefore, the PAL for arsenic in ground water has been revised, and will be provided as a revised Table 8-2A in Revision No. 01 of the Final QAPP.

Changes in Exposure Pathways, Toxicity, and Other Contaminant Characteristics

Some of the exposure pathways have been mitigated by the landfill capping activity; i.e., contact with site surface and subsurface soil via the landfill cap and revetment, and contact with a large portion of the original shoreline sediment that is now beneath the revetment slope, the constructed wetland, and the breakwater structure.

Review of Toxicity and Other Contaminant Characteristics

A review of *Final Preliminary Remediation Goals (PRG) for Allen Harbor Landfill (Site 09)* (Appendix D of EA 1998c) reveals that no significant changes have been issued in toxicity values, exposure factors, or exposure scenarios since the PRG were developed for COC in shellfish in Allen Harbor. From the PRG document, Table 10 presents exposure assumptions; Table 13 presents toxicity values; and Table 14 presents PRG for COC at the site. There have been no changes to toxicity values or exposure assumptions. Therefore, the PRG values presented are still valid.

There have been no changes for Site 09 with respect to ecological receptors. Terrestrial PRG for the protection of ecological receptors were established for arsenic and zinc, and aquatic PRG for the protection of aquatic receptors were established for copper, mercury, and nickel. Finally, an aquatic PRG for 4,4'-DDE for the protection of aquatic organisms was established for sediment. None of the exposure assumptions or toxicity values used to derive these PRG have changed since production of the CLTMP (NewFields 2000b). Therefore, there have been no risk and exposure changes that would impact PRGs established to protect ecological receptors over the last five years.

It must be noted that the National Oceanic and Atmospheric Administration (NOAA) Screening Quick Reference Tables (Buchman 1999) were used as the source for the Aquatic Water Quality Criteria (AWQC) for Table 8-2a in the Final QAPP (EA 2001e) for the PAL to screen piezometer water samples from the landfill. The EPA has subsequently released a new AWQC listing (U.S. EPA 2002); however, no changes in AWQC occurred for analytes listed in Table 8-2a of the Final QAPP. During this review, it was discovered that many of the values listed as AWQC in Buchman (1999) were not truly formal AWQC, but rather proposed or Lowest Observed Effect Concentrations (LOEC). Consequently, Table 8-2a has been modified to reflect: 1) updating and correction of the AWQC values to those provided in EPA (2002), 2) removal of the LOEC and proposed AWQC listed in Buchman (1999), and, 3) retaining the copper, mercury, and nickel site-specific screening values from the CLTMP (NewFields 2000b). None of these changes have a significant effect on the ability to detect exceedances, with the exception of pesticides and PCB, laboratory reporting limits are adequate to allow for a meaningful comparison. The preparation method for the sample aliquots for PCB analyses will be modified to decrease the detection limit by a factor of 10 for ME 05 (January 2003). Table 8-2a will be revised to reflect these revisions and will be included in Revision No. 01 of the Final QAPP. Pesticides have AWQC that are orders of magnitude lower than standard analytical methods. It is not practical to reduce the laboratory reporting limits below those shown for the pesticides listed in Table 8-2a.

Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

No weather-related events have affected the protectiveness of the remedy. There is no other information that calls into question the protectiveness of the remedy.

Technical Assessment Summary

Based on the data reviewed and site inspections, the remedy is functioning as intended by the ROD, as modified by the ESD, for ground water (from monitoring wells) beneath the site, for landfill gas, and for preventing contact with the site soil and waste material. However, except for the VOC detected at P09-10 and P09-08B, the results of the water samples from piezometers are inconclusive regarding the amount of their representativeness of discharge from the landfill versus recycled harbor water from a previous high tide stage. Lastly, the sediment sample results do not appear to indicate negative impact from ground water from the site, but the PAH and PCB exceedances in sediment (SED09-10 and SED09-01, respectively) may be localized remnants of the historical activity at the site. However, the PCB detections are in the vicinity of the soil removal action of Spring 1999 and the concentrations detected at P09-01 (220 µg/kg–1,600 µg/kg) have been below the removal action goal of 2,000 µg/kg.

There have been no changes in the physical conditions of the site that would affect the protectiveness of the remedy. The ARAR related to implementation of the remedy were met. The toxicity values, exposure assumptions, PRG values, and RAO used at the time of the remedy selection are still valid. Although there was one change in standards, the MCL for arsenic, it is not expected to have a negative impact on the remedy. Lastly, some of the exposure pathways have been mitigated by the landfill capping activity. There is no other information that calls into question the protectiveness of the remedy.

2.2.8 Issues

Issue	Currently Affects Protectiveness (Y/N)	Affects Future Protectiveness (Y/N)
Additional monitoring data required to assess ground-water discharge to the shoreline.	N	Y
Identified minor maintenance needs to landfill cap that do not impact the integrity to remedy.	N	N
Sustainability of the plans in the southern portion of the constructed wetland.	N	N
Deed and ELUR have not yet been recorded.	N	Y
Completeness of the monitoring well network.	N	Y

2.2.9 Recommendations and Follow-Up Actions

Issue	Recommendations/ Follow-Up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness? Y/N	
					Current	Future
Inadequate monitoring data	1) Continue to attempt to obtain all planned piezometer sample aliquots for analysis; particularly the salinity aliquot to aid assessment of representativeness of ground-water discharge. 2) Evaluation of the need for abandonment and replacement of MW09-14I and MW09-09D after evaluation of the ME 08 results.	Navy	EPA / RIDEM	Beginning June 2003 12/31/04 (contingent on prior completion of evaluation of ME 08 results)	N	Y
Maintenance needs for the cap	1) Repair of rutting in the LTMP dirt access roads. 2) Removal of vegetation from drainage pipe outlets and the southern drainage swale. 3) Re-seeding of bare spots on the cap surface. 4) Consider installation of additional geotextile over the area east of piezometer P09-03 where there appears to be some channeling of tidal waters through the breakwater structure. 5) Repair of the small sections of exposed geotextile fabric along the top and toe of the revetment and the breakwater structure. 6) Removal of two large shrubs in the vicinity of gas vent GV09-05 as a precaution so their roots do not impact the multimedia cap.	Navy	EPA / RIDEM	8/31/03 8/31/03 9/30/03 8/31/03 8/31/03 3/31/03	N	N
Constructed wetland plant sustainability	Assess whether or not replanting of the southern portion of the constructed wetland is appropriate	Navy	EPA / RIDEM	11/30/03	N	N
Recording of deed and ELUR	Work with the Town and National Park Service to expedite property transfer and recording of the deed and ELUR.	Navy	EPA / RIDEM	10/31/04	N	Y

Issue	Recommendations/ Follow-Up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness? Y/N	
					Current	Future
Monitoring well network completeness	Assess whether or not to replace damaged monitoring wells and/or consider adding wells to the monitoring network	Navy	EPA / RIDEM	12/31/04	N	Y

2.2.10 Protectiveness Statement

A protectiveness determination of the remedy at Site 09 cannot be made at this time until further information is obtained. Site 09 LTM plan states that 8 rounds of sampling will be completed prior to determining the protectiveness of the cap. As of this date 3 rounds of sampling have been completed. It is estimated that the 8 rounds of sampling will be completed by May 2004, at which time a protectiveness statement will be made. The remedy is expected to be protective of human health and the environment as long as the cap and institutional controls remain in place. Remedy of the site has been addressed through stabilization and capping of the waste and contaminated soil, gas vents, covering of most of the shoreline sediment with the constructed wetland, the installation of fencing and warning signs, and the implementation of institutional controls through the LUCIP to prevent exposure to, or ingestion of, contaminated ground water and to prevent ground surface activities (e.g., building, motorized vehicles except for LTM activities, digging) that could negatively impact the integrity of the landfill cap. The outstanding issue is the inconclusiveness of the available shoreline piezometer sample data to confirm the quality of ground water discharging from the site to the nearshore. Additional piezometers will be installed at each of the 10 locations to attempt to obtain all planned sample aliquots for analysis starting with ME 05 or ME 06. The results of the future complete analyses are hoped to aid in the determination of the representativeness of this sampled area. In addition, the Navy is considering conducting additional studies and/or other evaluations in the shoreline environment in order to better identify areas where plume discharge has the potential to occur, and to optimize long-term monitoring locations accordingly.

2.2.11 Next Review

The next five-year review for the former NCBC Davisville facility that includes Site 09 is required by March 2008, five years from the date of this review

3. ACTIVE SITES UNDER INVESTIGATION

3.1 STUDY AREAS 01 AND 04 AND SITES 02 AND 03 (CED AREA)

Sites 02 and 03 and Study Areas 01 and 04 are located in Zone 3, Parcel 7 of the former NCBC Davisville facility (Figures 1,6, and 7) and, because of their close proximity to one another, they are being considered together. Site 02 (CED Battery Acid Disposal Area) and Site 03 (CED Solvent Disposal Area) are in the RI phase. The completion of the RI of these two sites has been delayed since approximately August 2000 pending completion of the subsurface investigation and remedy implementation for the adjacent, upgradient property (former PR-58 Nike Site; Figure 1) by the U.S. Army Corps of Engineers (USACE). A dissolved CVOC plume in deep ground water extends beneath a portion of the Navy Parcel 7 from the former PR-58 Nike Site area. Study Area 01 (CED Drum Storage Area) and Study Area 04 (CED Asphalt Disposal Area) are also included with these sites because they require close-out under the Navy's environmental program and, due to their proximity to Sites 02 and 03, some of the environmental investigations at these study areas have been concurrent with those for Sites 02 and 03.

3.1.1 Introduction

Refer to Section 1.1 for description of the purpose of the five-year review.

3.1.2 Site Chronology

- 1955 to late 1970s – An estimated approximately 3,000 gal of solvents (paint thinners and unidentified solvents) was disposed at a rate of about 10 gal per month on the ground (Site 03) west of Sayers Street and Building 224. Neither the exact manner of solvent disposal nor the precise limits of the disposal area are known; however, the solvent disposal activity is thought to have occurred in an area that borders Sayers Street.

- 1955–1980 – Operation of a dry well and leaching field (Site 02) located at the southwest comer of the CED Building 224. A floor drain inside the Battery Shop portion of Building 224 discharged an estimated 18,000 gal of dilute sulfuric acid disposed at a rate of approximately 60 gal per month into the dry well and leaching field.

- Late 1960s – A black, pliable, solid asphaltic material was placed in a trench at Study Area 04.

- Late 1960s to 1974 – 55-gal drums of liquid waste, reportedly containing waste oil and solvent, were stored in an open field (Study Area 01) north of Building 224. The drums were removed in 1974.

- September 1984 – Completion of the Initial Site Assessment of the former NCBC Davisville facility (Hart 1984).

- February 1987 – Completion of the Verification Step - Confirmation Study of the former NCBC Davisville facility (TRC 1987).

- 1989 – EPA's Hazard Ranking Scoring Package for the former NCBC Davisville facility.

- 21 November 1989 – NCBC Davisville facility placed on the CERCLA NPL.

- December 1991 to April 1992 – a leaching field reportedly operated at Study Area 01 to dispose of surface water runoff and storm water from a truck washing area located south of the site at Building 224.

- March 1992 – FFA signed by the Navy, EPA, and the State of Rhode Island.

- June 1996 – The Site 02 dry well and associated leach field were removed by FWENC under contract to the Navy (FWENC 1996).

- November-December 1996 – The asphaltic material and affected soil at Study Area 04 was excavated and disposed by FWENC under contract with the Navy (FWENC 1997b).

- December 1998 – Revised Draft Final Phase III RI for Study Areas 01 and 04, Sites 02 and 03 (EA 1998b).

- August 2000 – Draft Final FS for Study Areas 01 and 04, Sites 02 and 03 (August 2000a).

- November 2000 – Final Human Health Risk Assessment for Soil at Study Areas 01 and 04 (EA 2000b).

- February 2001 – Draft Characterization of CVOC Contamination at the Former PR-58 Nike Site and Adjacent Navy Site 03 for USACE-New England District (NED) (EA 2001g).

- 3 April 2001 – USACE-NED meeting with residents to present their plan for additional offsite subsurface investigation.

- 9 August 2001 – USACE-NED meeting with residents to discuss geophysical and monitoring well drilling field locations and methods.

- 8 November 2001 – USACE-NED stated during the RAB meeting that they had received only four "right-of-entry" agreements to properties (an insufficient number) for their continued offsite investigation. USACE-NED to re-focus efforts to onsite work, perhaps pilot study to assess feasibility of one or more remedy techniques.

- November 2001 – Work Plan Addendum No. 2, Interim Ground-Water Sampling Program for the Navy Site 03 portion for EFANE (EA 2001f).

- November 2001 – Interim Ground-Water Sampling Event 01 for Site 03.

- June 2002 – Final Report of Interim Ground-Water Sampling Event 01.

- July 2002 – During re-scoping of the USACE-NED PR-58 Site contracts for performance of a pilot study to assess feasibility of a thermal injection remedy technique, USACE identified that additional funding would be needed and that they would pursue obtaining the additional funding. Additional funding will also be needed to complete the additional offsite subsurface investigation, and the problem with access to residential and Town property needs to be resolved.

3.1.3 Background

3.1.3.1 Physical Characteristics

Study Area 01 is the CED Drum Storage Area (Figure 6) and is located approximately 200 ft north of Building 224. It is currently a grassy, open field, a portion of which was converted into a leaching field in 1991.

Site 02 is a paved, flat area bounded to the west by Sayers Street, to the south by Warren Street, and to the north and east by Building 224 (Figure 6). Building 224 is not included in Site 02. A dry well and leaching field were located at the southwest comer of the CED Building 224. A floor drain inside the Battery Shop discharged into the dry well and leaching field in the northern portion of Site 02 (Hart 1984).

Site 03 is referred to as the CED Solvent Disposal Area, where workers from the maintenance shop reportedly disposed of solvents on a formerly paved (now mostly grass-covered to wooded) area to the west of the shop facility in Building 224 (Figure 6). This area has grown, as a result of a phased investigation, to include a large plume of CVOC dissolved in deep ground water emanating from an adjacent, west properly that was formerly Navy property, and was used by the Army as the PR-58 Nike missile site (Figure 1).

Study Area 04 is located approximately 800 ft west of Building 224 and 80 ft north of Battalion Boulevard (Figure 6) and is currently grass covered to wooded.

3.1.3.2 Land and Resource Use

The historic land use of the site area has included the training of Naval Seabee (construction battalions) staff in the use of heavy construction from approximately the early 1940s to the mid-1970s and maintenance of vehicles by the CED at Building 224.

Currently, the site area is undeveloped property with forest and grass cover and the Building 224 that is leased to tenants by RIEDC. RIEDC is redeveloping Parcel 7 under a Lease in Furtherance of Conveyance from the Navy.

The RIDEM ground-water classification for the property is GB. GB designates ground water that is presumed to require treatment before it is consumed. Future environmental covenants for this parcel will provide a ground-water use restriction to prevent the installation of water supply wells within the property.

In accordance with the LUCIP (EA 2002g), Parcel 7 includes the following environmental land-use restrictions:

- No construction of buildings for residential use.
- Water supply wells shall not be installed, nor shall ground water be utilized except for sampling or other remedial purposes.

Currently, LUCIP inspections of Parcel 7 are performed in conjunction with each Site 03 Interim Ground-Water Sampling Event (IGWSE), but no less frequently than annually, to document that there has been no variance from the environmental land-use restrictions stated above. After completion of the RODs for the sites in this parcel, the LUCIP inspections of Parcel 7 would continue in conjunction with each site ME, but no less frequently than annually, to document that there has been no variance from the environmental land-use restrictions stated above and there has been no interference with the monitoring system.

The purpose of the environmental land-use restriction is to ensure:

- That the entire parcel shall not be used for residential purposes as required for property under a Maritime Administration transfer.
- That ground water for the entire parcel shall not be withdrawn or utilized except for sampling or other remedial purposes.

3.1.3.3 History of Contamination

Study Area 01 From the late 1960s to 1974, 55-gal drums of liquid waste, reportedly containing waste oil and solvent, were stored in an open field north of Building 224. As many as 500 drums were stored there at one time. The drums were reported to be in deteriorating condition and may have leaked liquids into the ground (Hart 1984). The drums were removed in 1974. No testing of the soil beneath the drums was performed at that time. File information indicates that a leaching field was installed on the site [Study Area 01] and was operative from December 1991 to April 1992 to dispose of surface water runoff and storm water from a truck washing area south of the site at Building 224 (Halliburton NUS 1994a). The leaching field was closed in accordance with RIDEM regulations.

Site 02 A dry well and leaching field were located at the southwest comer of the CED Building 224. A floor drain inside the Battery Shop discharged into the dry well and leaching field in the northern portion of Site 02 (Hart 1984). It was estimated that

approximately 18,000 gal of dilute sulfuric acid were disposed, at a rate of approximately 60 gal per month, between 1955 and 1980. The acid reportedly contained lead (TRC 1991).

Site 03 From 1955 to the late 1970s, paint thinners and unidentified solvents were disposed on the ground, west of Sayers Street and Building 224. Neither the exact manner of solvent disposal nor the precise limits of the disposal area are known; however, the solvent disposal activity is thought to have occurred in an area which borders Sayers Street. The IAS (Hart 1984) estimated that approximately 3,000 gal of solvents were disposed at a rate of about 10 gal per month. Part of Site 03 was also used to store heavy equipment (TRC 1991). This area has grown, as a result of a phased investigation, to include a large plume of CVOC dissolved in deep ground water emanating from an adjacent, west property that was formerly Navy property, and was used by the Army as the PR-58 Nike missile site (Figure 1). The former Nike site is currently under investigation via the Formerly Utilized Defense Sites (FUDS) program of USACE-NED. The investigation, to date, shows the major CVOC source area for deep ground water to be on the former Nike site with the main plume moving east toward and beneath a portion of Navy Parcel 7. A branch of the plume extends to the north beyond the Navy property line towards private residences where private wells have been identified. The wells located in the eastern portion of Site 03 (around and east of Building 224) appear to also monitor minor contributions to the plume from former Navy activities in that area.

Study Area 04 Sometime in the late 1960s, a black, pliable, solid, asphaltic material was placed in a trench in this area. The source of this material is unknown (Halliburton NUS 1994b).

3.1.3.4 Initial Response

Study Area 01 The drums were removed in 1974. The leaching field was closed in accordance with RIDEM regulations.

Site 02 The dry well and associated leach field were removed by FWENC in June 1996 (FWENC 1996). Closeout for Site 02 included removal of water and sediment from the dry well chamber, removal and demolition of the dry well chamber and associated piping, removal of piping from the adjacent leach field, excavation of lead-impacted soil, decommissioning of three monitoring wells, and cleanup of the battery rooms in Building 224 and Building A10CT.

Site 03 The Navy has agreed to monitor the Site 03 area as part of their RI/FS process pending completion of the USACE investigation of the adjacent, upgradient property. This will continue until that offsite primary source area is addressed and the Navy's Parcel 7 property can be transferred. Further ground-water monitoring, along with land-use controls, will then be proposed as the final remedy for this area within Parcel 7.

The objective of the Interim Ground-Water Sampling Program (IGWSP) (sampling of 23 monitoring wells for VOC analysis) is to provide the Navy with continued documentation and monitoring of the nature and extent of that portion of the CVOC plume that has migrated from

the former PR-58 Nike Site to beneath a portion of the adjacent former NCBC Davisville facility. The wells located in the eastern portion of this area (around and east of Building 224) appear to also monitor minor contributions to the plume from former Navy activities in that area. The locations of the selected monitoring wells are shown on Figure 6.

This IGWSP will be continued annually until the ROD is signed for Site 03, and will be performed in accordance with the Revised Final Work Plan QAPP, Addendum No. 2 (EA 2001f).

Study Area 04 The area of asphaltic material was excavated by FWENC in November 1996 under contract with the Navy. Asphaltic material and affected soil were removed during the excavation. Four pits were excavated to remove asphalt material. Confirmatory sampling was performed on the sidewalls and bottom of the excavation pits. Samples were analyzed for total petroleum hydrocarbons (TPH) and PCB. Excavations were backfilled with clean soil in December 1996 after confirmatory sampling yielded results below the RIDEM criteria of 10 ppm for PCB and 300 ppm for TPH. Details of the excavation can be found in the Contractor's Close-Out Report for the Removal Action at Study Area 04, NCBC Davisville, Rhode Island (FWENC 1997b).

3.1.3.5 Basis for Taking Action

Contaminants

Ground Water
TCE
1,1,2,2-PCA
1,2-DCE

Soil
PCB
Lead

Study Area 01 Based on an HHRA of surface and total soil (EA 2000b), non-carcinogenic risks did not exceed the EPA threshold of 1.0 for potential future receptors, including for surface soil (commercial workers, child residents, adult residents) and total soil (construction workers, child residents, adult residents) for Study Area 01. Additionally, there were no cancer risks which exceeded EPA's "acceptable risk range" of 10^{-6} to 10^{-4} for potential future industrial receptors, and cumulative risks were below 10^{-5} for potential commercial receptors. Also, there were no cancer risks that exceeded EPA's "acceptable risk range" of 10^{-6} to 10^{-4} for potential future residential receptors. However, RIDEM does not accept this HHRA prepared under CERCLA guidance, because it is RIDEM's position that the criteria utilized to arrive at the risk values do not meet RIDEM Remediation Regulation criteria. Further, it is RIDEM's position that if remediation is not possible, then an Environmental Land-Use Restriction will be required that would prevent residential land use.

Sites 02 and 03 The 1995 HHRA prepared under CERCLA guidance evaluated the following exposure scenarios: (1) construction/remediation workers, (2) commercial/industrial workers, (3) resident adults, and (4) children in a daycare. Media of concern included soil, air, and ground water. No unacceptable risks were identified from site soils or from indoor inhalation of vapors from ground water. However, unacceptable non-cancer and cancer risks were identified for the ingestion of ground water from beneath the sites. After the removal of the Site 02 dry well, leach field, and affected soil, lead risk modeling for soil was performed consistent with EPA guidance (U.S. EPA 1994) using data of samples from the remaining soil. The result was that there are no concerns for adverse effects from lead in soil at Site 02. However, RIDEM has stated that there are lead levels in Site 02 soil remaining above RIDEM Remediation Regulation Residential Exposure Criteria, and if remediation is not possible, then an Environmental Land-Use Restriction will be required which prevents residential land use.

Study Area 04 Based on an HHRA of surface and total soil (EA 2000b), non-carcinogenic risks did not exceed the EPA threshold of 1.0 for potential future receptors including for surface soil (commercial workers, child residents, adult residents) and total soil (construction workers, child residents, adult residents) for Study Area 01. Additionally, there were no cancer risks which exceeded EPA's "acceptable risk range" of 10^{-6} to 10^{-4} for potential future industrial receptors and cumulative risks were below 10^{-5} for potential commercial receptors. Also, there were no cancer risks that exceeded EPA's "acceptable risk range" of 10^{-6} to 10^{-4} for potential future residential receptors. The only residential constituent of potential concern with risks greater than 10^{-5} was Aroclor-1260 in surface soil and total soil with a cumulative risk for the combined adult and child resident of 2.5×10^{-5} and 2.3×10^{-5}, respectively. The Navy also met the RIDEM Method 1 Direct Exposure Criteria for this site, and on that basis, none of the confirmatory soil PCB samples exceeded RIDEM's 10 ppm residential exposure criteria.

3.1.4 Remedial Actions

The section is not applicable because these sites are still under investigation.

3.1.4.1 Remedy Implementation

The section is not applicable because these sites are still under investigation

3.1.4.2 System Operation/Operation and Maintenance

The section is not applicable to these sites because they are still in the investigation stage; i.e., there is no ROD. However, in the interim there is an IGWSP with annual ground-water sampling events and LUCIP inspections of Parcel 7 within which Study Areas 01 and 04 and Sites 02 and 03 are located in the western portion.

3.1.5 Progress Since the Last Five-Year Review

This is the first five-year review for these sites.

3.1.6 Five-Year Review Process

3.1.6.1 Administrative Components

Refer to Section 1.1.

3.1.6.2 Community Involvement

Refer to Section 1.1.

3.1.6.3 Document Review

Documents reviewed are referenced in this Section 3.1 and the citations are included in the List of References.

3.1.6.4 Data Review

Based on the annual Institutional Control Inspections of 20 November 2001 and 13 December 2002), there was compliance with the institutional controls stated in the LUCIP (EA 2002g) for this portion of Parcel 7.

This site is under the RI phase and a ROD has not yet been signed for this area; i.e. the remedy for this site has not been selected. The ground water is not being used for any purpose. The leasee is aware of the contamination in the soil and ground water, and has no plans to more intensively occupy the area until the investigations have been completed. In the interim, to date, the results as of the Revised Draft Final Phase III RI (EA 1998b) and the additional HHRA for soil (EA 2000b) do not indicate immediate unacceptable risk exposure to human health or the environment from the Navy's historical use of the site.

3.1.6.5 Site Inspections

The initial annual LUCIP (Institutional Control) inspection of Parcel 7, which includes Sites 02 and 03, occurred on 20 November 2001 followed by a second inspection on 13 December 2002. Based on these Institutional Control Inspections, there was compliance with the institutional controls stated in the LUCIP (EA 2002g) for this portion of Parcel 7.

3.1.6.6 Interviews

The section is not applicable because these sites are still under investigation.

3.1.7 Technical Assessment

Question A: Is the remedy functioning as intended by the decision documents?

The section is not applicable because these sites are still under investigation.

Question B: Are the exposure assumptions, toxicity data, cleanup values, and remedial objectives (RAO) used at the time of the remedy selection still valid?

The section is not applicable because these sites are still under investigation.

Changes in Standards and To-Be-Considereds

The section is not applicable because these sites are still under investigation

Changes in Exposure Pathways, Toxicity, and Other Contaminant Characteristics

The section is not applicable because these sites are still under investigation.

Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

The section is not applicable because these sites are still under investigation.

Technical Assessment Summary

The section is not applicable because these sites are still under investigation.

3.1.8 Issues

The section is not applicable because these sites are still under investigation. However, completion of the investigation and ROD are being delayed at least 1-2 years until a remedy is implemented by USACE-NED for the source area of the dissolved CVOC plume in deep ground water from the adjacent, upgradient former PR-58 Nike Site property. Based on discussions during the 12 September 2002 BCT Meeting, if the former PR-58 Nike Site compliance wells were installed by 2004 and RIDEM concurrence was obtained for the PR-58 Nike Site in 2005, there could be a ROD in 2007 for Study Areas 01 and 04 and Sites 02 and 03.

3.1.9 Recommendations and Follow-Up Actions

Continue the IGWSP and await the completion of the USACE work at the adjacent, upgradient former PR-58 Nike Site so the RI/FS and ROD can be completed for this portion of the Navy's Parcel 7.

3.1.10 Protectiveness Statement

These sites are under the RI phase and so a ROD has not yet been signed for this area; i.e. the remedy for these sites have not been selected. A protectiveness determination of the remedy at these sites can not be made at this time until further information is obtained. The remedy is expected to be implemented in 2007, at which time a protectiveness determination will be made. Based on the analytical results for ground-water samples from the expanded Site 03 area, the upgradient (western) portion of the dissolved CVOC plume in deep ground water is above RIDEM GB standards. However, the ground-water use restrictions included in the LUCIP for Parcel 7 prevents exposure to humans via such a pathway. To date, the results as of the Revised Draft Final Phase III RI (EA 1998b) and the additional HHRA for soil (EA 2000b) do not indicate immediate unacceptable risk exposure to human health or the environment from the Navy's historical use of the site.

3.1.11 Next Review

The next five-year review for the former NCBC Davisville facility that includes Site 03 is required by March 2008, five years from the date of this review.

3.2 SITE 16

3.2.1 Introduction

Refer to Section 1.1 for description of the purpose of the five-year review.

3.2.2 Site Chronology

- 1951-53 – Rust removal (heated manganesed phosphoric acid), metal preservation (Cosmolene – particularly for Quonset Huts), and degreasing (chlorinated solvent, including a solvent recovery still) operations in Building 41. Waste solvent and sludge from the solvent recovery still were transported in drums to the Allen Harbor Landfill for disposal.

- 1954 – The preservation and degreasing operations in Building 41 were reportedly moved south to Building E-319.

- Late 1960s – Creosote dipping of wood pilings in the EBS 28 area.

- September 1984 – Completion of the Initial Site Assessment of the former NCBC Davisville facility (Hart 1984).

- February 1987 – Completion of the Verification Step - Confirmation Study of the former NCBC Davisville facility (TRC 1987).

- 1989 – EPA's Hazard Ranking Scoring Package for the former NCBC Davisville facility.

- 21 November 1989 – NCBC Davisville facility placed on the CERCLA NPL.

- March 1992 – FFA signed by the Navy, EPA, and the State of Rhode Island.

- 6 December 1994 – Tank 41-5 (apparently the phospholene [manganesed phosphoric acid] rust removal tank) removed from Building 41 (HRP 1995a).

- 9 December 1994 – Tank 41-6 (vapor degreasing unit) removed from concrete vault in floor of Building 41 and vault backfilled with common fill and asphalt patch at floor grade (HRP 1995b).

- 9 December 1994, 3 and 5 January 1995 – Tank 41-1 system (cosmolene preservation tank) removed from floor of Building 41 along with impacted soil and excavation backfilled with common fill and asphalt patch at floor grade (HRP 1995c).

- EBS Program – Identified the various EBS Review Items within the Site 16 investigation area (EA 1995, EA 1998d, and EA 1998e).

- 7 March 1997 – EBS Review Item 81 septic tanks (buried and interconnected pontoon tanks) cleaned. Tanks were backfilled with clean fill on 13 April 1998 (FWENC 1998a).

- 9 December 1997 – two septic tanks (buried and interconnected pontoon tanks) excavated and removed along with the related TPH-impacted soil at EBS Review Item 60/28 (FWENC 1998a).

- EBS Review Item 28 designated as Study Area 16.

- Study Area 16 designated as IR Program Site 16.

- October 2001 – Draft Phase I RI report submitted.

- Phase II RI – ongoing.

3.2.3 Background

3.2.3.1 Physical Characteristics

Site 16 was formerly designated EBS Review Item 28, and subsequently designated as Study Area 16 after the BCT reviewed data from the Phase II EBS (EA 1998d) and the Phase II EBS Follow-On Investigation (EA 1998e). It was also determined that further investigation would be conducted under the CERCLA program, rather than the EBS program. Four of the EBS Review Items (28, 60, 85, and 86) were located in the Study Area 16 vicinity. However, Review Item 28 (former Creosote Dip Tank Area and a suspected former Fire Fighting Training Area [FFTA]) comprised the largest portion of Study Area 16. As a result of CVOC detected in deep ground- water samples, Study Area 16 was re-designated as IR Program Site 16. Like Study Area 16, Site 16 is located in the eastern portion of Zone 3 at the former NCBC Davisville facility, and the ongoing Phase II RI now extends south from Parcel 7 (Figure 7) into a portion of Zone 4 and east beyond Parcel 7 (Figures 1, 8, and 9).

The north central portion of the Site 16 investigation area (generally the former EBS Review Item 28/Study Area 16) is primarily wooded with the exception of an asphalt-paved area in the center. This area is generally bounded by Westcott Road, Davisville Road, Allens Harbor Road, and the Allen Harbor southern shoreline (Figure 8). An unnamed asphalt-paved road circles the outer perimeter in this portion of the site and was formerly used by the Navy for the purpose of training construction equipment operators. In the past, this area was extensively bulldozed and disrupted during training exercises, but now has a vegetative cover of shrubs and grasses. The site topography slopes from a height of approximately 33 ft above MSL in the southwest corner down to MSL along the Allen Harbor shoreline in the northeastern portion of the site. The area immediately around Building E-107 is also paved for parking. The area west of Building E-107 (east of Westcott Road) is grass-covered. The area west of Westcott Road is the eastern portion of a former NCBC gravel borrow pit and is densely overgrown. The area south of Davisville Road slopes gently toward the east and includes former Building 41 (demolished in October 2002) south to Building 318 and adjacent paved areas, and a generally grass- and weed-

covered area of several old railroad spurs located east of former Building 41 and northeast of Building 318. The area east of Allens Harbor Road is an asphalt-paved lot where new cars are temporarily stored after delivery by ships.

3.2.3.2 Land and Resource Use

The historic land use of the site area has included the training of Naval Seabee (construction battalions) staff in the use of heavy construction from approximately the early 1940s to the mid-1970s, former warehouses, and some preservation activities.

Currently, the site ranges from undeveloped property with forest and grass cover to redeveloped buildings (for commercial use) to large paved areas used for parking new cars until they are delivered to dealers.

The RIDEM ground-water classification for the property is GB. GB designates ground water that is presumed to require treatment before it is consumed. Future environmental covenants for this parcel will provide a ground-water use restriction to prevent the installation of water supply wells within the property.

In accordance with the LUCIP (EA 2002g), Parcel 7 includes the following environmental land-use restrictions:

- No construction of buildings for residential use
- Water supply wells shall not be installed, nor shall ground water be utilized except for sampling or other remedial purposes.

Currently, LUCIP inspections of Parcel 7 are performed in conjunction with each Site 03 IGWSE, but no less frequently than annually, to document that there has been no variance from the environmental land-use restrictions stated above. After completion of the RODS for the sites in this parcel, the LUCIP inspections of Parcel 7 would continue in conjunction with each site ME, but no less frequently than annually.

The purpose of the environmental land-use restriction is to ensure:

- That the entire parcel shall not be used for residential purposes as required for property under a Maritime Administration transfer
- That ground water for the entire parcel shall not be withdrawn or utilized except for sampling or other remedial purposes.

3.2.3.3 History of Contamination

Six EBS Review Items were located within the Site 16 investigation area (Figure 8), four of which were determined to require NFA. The following provides a brief description of each one.

EBS Review Item 28 - Former Creosote Dip Tank Area, Suspected Former Fire Fighting Training Area, and Two Suspected Underground Storage Tank (UST) Areas—Creosote dipping of wood pilings occurred during the late 1960s in the western portion of the area (Figure 8). The wood pilings were dipped into tanks containing creosote and staged in the area to dry before being loaded onto ships. In the early 1990s an upended creosote dip tank was identified in the western portion of the site adjacent to the paved road. The location where the tank was found is the "original" Creosote Dip Tank Area that was first addressed by Halliburton NUS in 1992 and was further investigated by EA during the Phase II EBS. However, based on additional information provided by a former Seabee after the Phase II EBS fieldwork was completed, the Navy learned that past creosote dipping operations were likely conducted over a larger area than originally thought. That area comprised the land west of and adjacent to a wooden bermed structure that is still present at the site (Figure 8). The Phase II EBS Follow-On and Addendum II work investigated the "expanded" Creosote Dip Tank Area. Based on the results of related EBS investigations, study of this former area continued into the Phase I and II RI.

It is reported that a suspected former FFTA had been located in an asphalt-paved area to the east of the former Creosote Dip Tank Area (Figure 8). Reportedly, structures were constructed, doused with flammable materials, set on fire, and extinguished as part of fire fighting training exercises during the late 1960s. Based on the results of related EBS investigations, study of the former FFTA continued into the Phase I and II RI.

Also considered under this Review Item are four USTs that were reported to potentially have been located near Building E-107. Three of the potential USTs were reported to have been located west of Building E- 107 in the vicinity of a former pump island, and one UST was reportedly located by the southeast comer of Building E-107. During the EBS investigations, no remaining USTs were located in the vicinity of a former pump island. Therefore, NFA was recommended.

EBS Review Item 29 - Building 41—As stated in the Phase II EBS Report (EA 1998d), this building was a preservation and packing shop, and a construction equipment and automotive parts storage building (Figure 8). Preservation and degreasing operations occurred at Building 41. Because Building 41 was demolished and the area paved by RIEDC during October 2002, the following paragraphs are based on available information and observations prior to the demolition activity. Based on past activities, it is likely that petroleum products and solvents were used and stored onsite. The preservation tanks were addressed under the Navy's UST program. Stained asphalt floors in Building 41 were not considered to be of concern during the Phase II EBS, based on the limited extent of the staining, the sorptive ability of asphalt, and the lack of a direct pathway (e.g., spill runoff from the concrete to a foundation wall or soil). No

floor drains were located in Building 41. The floor staining was considered to be consistent with the previous use of the building as an equipment preservation and packing shop, and parts storage. Recommendations for NFA were made following review of available Phase II EBS information and site visits conducted by the BCT, the Town of North Kingstown, and RIEDC in September and October 1995. No field activities were conducted and no samples were collected for this Review Item based on the BCT recommendation for NFA.

During the Phase I RI, discussions occurred during November 2000 with a Seabee veteran, who worked in Building 41 during 1951 to 1953, to improve our understanding of the historical use of the building during that time. Additionally, there was a visit to the building in February 2001 with the same Seabee veteran. According to this veteran, the rust removal (heated manganesed phosphoric acid), metal preservation (Cosmolene – particularly for Quonset Huts), and degreasing (chlorinated solvent, including a solvent recovery still) operations in Building 41 seemed to have begun and ended between 1951 and 1953. Waste solvent and sludge from the solvent recovery still were transported in drums to the Allen Harbor Landfill for disposal. After 1953, the preservation and degreasing operations were reportedly moved south to Building E-319.

Building 41 was divided into three sections as shown on Figure 10. Figure 10 illustrates the current understanding of the historical use of the building during 1951 to 1953, based on the above discussions during the Phase I RI, and from historical floor plan drawings obtained from RIEDC. The following summarizes the activities that reportedly occurred in the three sections of the building:

- The northeastern third (bay) of the building was reportedly used for packing and storage of parts for shipment. The area was observed on 15 February 2001 to be a large room with a high ceiling and generally empty, except for piles of salted sand stored by RIEDC in part of the southwestern portion.

- The middle third of the building was used for preservation of Quonset Huts by dipping in a large, partially in-ground tank(s) of Cosmolene (a grease used to prevent rusting of metallic surfaces). The Cosmolene dipping appears to have included a group of four tanks (Tanks 41-1 through 41-4). This portion of the building was observed in February 2001 to be a large room with a high ceiling and generally empty, except for the southwestern portion as stated below:

  — Historically, rust was stripped from metal parts in an aboveground tank of phospholene (manganesed phosphoric acid). This tank was reportedly above floor grade, and was apparently Tank 41-5 that was removed from the building in December 1994. Based upon a related Tank Closure Assessment Report by HRP Associates, Inc. (HRP 1995a), Tank 41-5 was a rectangular, open-top steel tank located along the east wall of the former restrooms area. An area of etching of the concrete floor surface, observed on 15 February 2001, may be evidence of their former location.

— The southwest portion was insulated and has a lowered ceiling, apparently to retain heat for the workers in that area. This area was reportedly used for the packing of preserved small metal parts for vehicles.

- The southwestern third of the building was used for degreasing activity that included a vapor degreasing unit and a solvent recovery still. The area was also used for packing and shipping of parts. The vapor degreasing tank (apparently Tank 41-6) and associated equipment were located in a pit (concrete vault) in the floor. Based upon a related Tank Closure Assessment Report by HRP Associates, Inc. (HRP 1995b), Tank 41-6 was a 500-gal rectangular steel tank and equipment that was removed in December 1994 as part of the Navy's UST program. According to the report, the tank "was dry and required no cleaning prior to removal." The concrete vault in the floor of the building "was 5 ft wide, 6 ft long, and 7 ft deep." After removal of the tank, the pit (vault) was filled with common fill consisting of a sand and gravel mix, and then completed with an asphalt surface at floor grade that was visible during the building walkover. This area of Building 41 was observed on 15 February 2001 to be a large room with a high ceiling and generally empty, except for the northeastern portion where the old solvent recovery still equipment was still present. There was reportedly also a locked cage area where tools were stored in this portion of the building.

EBS Review Item 60 - Building E-107 Septic Tanks—This Review Item includes locations both within and beyond the Phase I and II RI area. The septic tank location within the Phase I and II RI area was reportedly located at the southeast comer of Building E-107 (Figure 8). A geophysical survey was conducted to locate that tank. However, excavation and removal of the tank (actually two buried pontoons) was addressed under Review Item 28.

EBS Review Item 81 -Former Building 41 Septic Tanks—Three separate steel pontoon tanks connected by pipes were located on the northern side of the former building (Figure 8). Available subsurface plans showed no leaching field connected to these structures. The tanks are rectangular-shaped structures constructed of steel with holes cut into the bottom and sides. The tanks were adapted from steel pontoons to act as a cesspool.

EBS Review Item 85 -Former UST Area—One UST was removed from along the western portion of the south side of Building E-107 (Figure 8) and, based on related EBS investigations, NFA was recommended.

EBS Review Item 86 -Building E-107 Floor Drains—Six floor drains were identified in Building 107 (Figure 8). Two of the floor drains were under floor tile and are not accessible. Four of the floor drains were visible and accessible.

A more complete description of Site 16 can be found in the Phase I RI (EA 2001b).

3.2.3.4 Initial Response

EBS Review Item 28—During the EBS investigations, the reported UST near the southeast comer of Building E-107 was found to be two septic tanks (buried and interconnected pontoon tanks) that were excavated and removed along with the related TPH-impacted soil (FWENC 1998a).

EBS Review Item 29 - Building 41—The Cosmolene dipping appears to have included a group of four tanks (Tanks 41-1 through 41-4). Based upon a related Tank Closure Assessment Report by HRP Associates, Inc. (HRP 1995c), the tanks were excavated in January 1995, cleaned, and disposed of as part of the Navy's UST program. A petroleum-based material was shoveled from the tanks before steam cleaning them. The metal tanks were reported to be in good condition (no rust or breaks) and there was no apparent leakage. It was reported that there was no petroleum odor or discernable staining in the excavation and TPH was not detected (less than 21 mg/kg) in the final soil samples collected from the base of the excavation (about 6 ft bgs). Tank 41-1 was a 6,500-gal rectangular, open-top steel tank within which there were three 900-gal square, open- top steel tanks (41-2, 41-3, and 41-4). Based on the presence of an old steam pipe that entered near the base of the west end of Tank 41-1, this tank appeared to have been used to heat the other three tanks. The excavation was backfilled to grade using the excavated soil and a common borrow fill consisting of a sand and gravel mix, and completed with an asphalt surface at floor grade that is still visible.

Based on the Tank Closure Assessment Report by HRP Associates, Inc. (HRP 1995a), Tank 41-5, apparently the phospholene [manganesed phosphoric acid] tank, was removed from the building in December 1994.

Based upon a Tank Closure Assessment Report by HRP Associates, Inc. (HRP 1995b), Tank 41-6 (vapor degreasing unit) and equipment was removed in December 1994 as part of the Navy's UST program. According to the report, the tank "was dry and required no cleaning prior to removal." The concrete vault in the floor of the building "was 5 ft wide, 6 ft long, and 7 ft deep." Because the tank was removed from a concrete vault, there was no excavation. Following removal from the vault, it was reported that "the tank appeared to be in generally good condition with some staining along the upper edge, around plumbing fixtures, and under small holes in the tank walls. The tank piping was constructed of steel and appeared to be in moderate condition. Pipe joints were secure with no visible signs of leakage. The floor and sidewalls of the vault were stained, especially in the east corner." The pit was filled with common fill consisting of a sand and gravel mix, and then completed with an asphalt surface at floor grade that was visible during the building walkover.

EBS Review Item 81 - Former Building 41 Septic Tanks—The sludge was removed from the septic tanks, and the tanks cleaned (7 March 1997), and backfilled and capped (13 April 1998) (FWENC 1998a). Based on related EBS investigations and closure of the tanks, NFA was recommended. During September 2002, this area was re-graded and paved by RIEDC.

EBS Review Item 85 - Former UST Area—One UST was removed from along the western portion of the south side of Building E-107 (Figure 8) and, based on related EBS investigations, NFA was recommended.

EBS Review Item 86 - Building E-107 Floor Drains—The four floor drains that were visible and accessible were closed by FWENC. Trenching activity was conducted by FWENC east of the building. However, no connecting piping was found between these floor drains and an outfall pipe located at the near shoreline of Allen Harbor. Some subsurface investigation outside the building continued into the Phase I and II RI, including the installation of monitoring well cluster MW16-48S/I/D (Figure 9) from which sampling results will not be available until Spring 2003.

3.2.3.5 Basis for Taking Action

Contaminants

Ground Water
TCE

Soil
PAH

A draft Phase I RI report was submitted for review in October 2001 (EA 2001b). The conclusion of the risk assessment was that the ground water would be an unacceptable risk to either residents drinking it or construction workers coming into contact with it (EA 2001d). Soils and seeps were not deemed to be a risk to human health. Sediments were not evaluated for human health risk nor was an indoor air model evaluated. EPA has requested that the Navy evaluate these exposure pathways for completeness. EPA believes that if this area were possibly made into a residential community, residents may be exposed to sediments in the Harbor. EPA is also concerned with VOC detected in push probe-collected samples of shallow ground water that were at concentrations above screening levels. The Navy has agreed to evaluate the need for these exposure pathways.

The Screening Level Ecological Risk Assessment concluded that there was no unacceptable risk due to soil exposure (EA 2001c). EPA has requested additional sediment sampling and a further evaluation of the risk due to sediment and seep exposures. The Navy has agreed to further evaluate the need for these exposure pathways.

3.2.4 Remedial Actions

The section is not applicable because this site is still under investigation.

3.2.4.1 Remedy Implementation

The section is not applicable because this site is still under investigation.

3.2.4.2 System Operation/Operation and Maintenance

The section is not applicable to this site because it is still in the investigation stage; i.e., there is no ROD. However, there are LUCIP inspections of Parcel 7 within which Site 16 is located in the eastern portion.

3.2.5 Progress Since the Last Five-Year Review

This is the first five-year review for the site.

3.2.6 Five-Year Review Process

3.2.6.1 Administrative Components

Refer to Section 1.l.

3.2.6.2 Community Involvement

Refer to Section 1.1.

3.2.6.3 Document Review

Documents reviewed are referenced in this Section 3.2 and the citations are included in the List of References.

3.2.6.4 Data Review

The initial annual LUCIP (Institutional Control) inspection of Parcel 7, which includes Site 16, occurred on 20 November 2001, followed by a second inspection on 13 December 2002. Based on these Institutional Control Inspections, there was compliance with the institutional controls stated in the LUCIP (EA 2002g) placed on this parcel. However, the Town of North Kingstown excavated and installed a forced main sewer line through the northern edge of Site 16 without prior notification to RIEDC. During a 14 March 2002 BCT meeting, the EPA representative notified the Navy that they had observed this excavation that day. The Navy then notified the RIEDC of the excavation activity by telephone and a letter requesting a meeting to discuss better coordination of any work being conducted at this parcel. The excavation was adjacent to two of the Navy's monitoring wells. However, these wells did not appear to be damaged and there was no apparent site-related health or safety concerns to the excavation workers. The meeting resulted in better communications between the related parties to preclude re-occurrence of such a situation.

Based upon the results of samples collected for several investigations across Site 16 from 1991 to 2001, PAH and inorganics have been detected at concentrations above residential screening levels in the soils. Based on the available sample results, ground water has been found to be contaminated with VOC, mostly TCE and daughter products, with the highest detected TCE

concentrations of over 6,400 µg/L in the deep overburden, and over 4,700 µg/L in the shallow bedrock. Based on the understanding from the Phase I RI, the main portion of the dissolved VOC plume detected in deep ground water appears to be present beneath an area ranging from the vicinity of the southern portion of the northeast end of Building 41 northeast to at least the southern edge of the harbor (well clusters MW16-04 and MW16-05) and at least 100 ft east of Allens Harbor Road (well clusters MW16-27 and MW16-28) (Figure 9). Figure 9 shows the locations of both the Phase I RI wells (typically MW16-01 through MW16-29) and wells installed for the Phase II RI (typically wells MW16-30 through MW16-55). Results of a Phase II RI sampling event (included resampling of the Phase I RI wells) will be available Spring 2003. The ongoing Phase II RI is planned to further characterize the nature and extent of the plume detected during the Phase I RI, suspected contamination beneath the former vapor degreasing unit and under the Cosmolene tanks of the former Building 41, along with the potential southern extension and/or additional source area of the CVOC plume in the area between former Building 41 and Building E-319 in the railroad spur area; the potential western extension and/or additional source area of the CVOC plume, and the eastern extent of the CVOC plume in deep ground water. A Phase III RI is planned for the future based on the findings of the Phase II RI.

A draft Phase I RI report was submitted for review in October 2001 (EA 2001b). The conclusion of the risk assessment was that the ground water would be an unacceptable risk to either residents drinking it or construction workers coming into contact with it (EA 2001d). Soils and seeps were not deemed to be an unacceptable risk to human health. Sediments were not evaluated for human health risk nor was an indoor air model evaluated. EPA has requested that the Navy evaluate these exposure pathways for completeness. EPA believes that if this area were possibly made into a residential community, residents may be exposed to sediments in the Harbor. EPA is also concerned with VOC detected in push probe-collected samples of shallow ground water that were at concentrations above screening levels. The Navy has agreed to evaluate the need for these exposure pathways.

The Screening Level Ecological Risk Assessment concluded that there was no unacceptable risk due to soil exposure (EA 2001c). EPA has requested additional sediment sampling and a further evaluation of the risk due to sediment and seep exposures. The Navy has agreed to further evaluate the need for these exposure pathways.

3.2.6.5 Site Inspections

The initial annual LUCIP (Institutional Control) inspection of Parcel 7, which includes Site 16, occurred on 20 November 2001 followed by a second inspection on 13 December 2002. Based on these Institutional Control Inspections, there was compliance with the institutional controls stated in the LUCIP (EA 2002g) placed on this parcel. However, the Town of North Kingstown excavated and installed a forced main sewer line through the northern edge of Site 16 without prior notification to RIEDC. During a 14 March 2002 BCT meeting, the EPA representative notified the Navy that they had observed this excavation that day. The Navy then notified the RIEDC of the excavation activity by telephone and a letter requesting a meeting to discuss better coordination of any work being conducted at this parcel. The excavation was adjacent to two of the Navy's monitoring wells. However, these wells did not appear to be damaged and there was

no apparent site-related health or safety concerns to the excavation workers. The meeting resulted in better communications between the related parties to preclude re-occurrence of such a situation.

3.2.6.6 Interviews

The section is not applicable because this site is still under investigation.

3.2.7 Technical Assessment

Question A: Is the remedy functioning as intended by the decision documents?

The section is not applicable because this site is still under investigation.

Question B: Are the exposure assumptions, toxicity data, cleanup values, and remedial objectives (RAO) used at the time of the remedy selection still valid?

The section is not applicable because this site is still under investigation.

Changes in Standards and To-Be-Considereds

The section is not applicable because this site is still under investigation.

Changes in Exposure Pathways, Toxicity, and Other Contaminant Characteristics

The section is not applicable because this site is still under investigation.

Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

The section is not applicable because this site is still under investigation.

Technical Assessment Summary

The section is not applicable because this site is still under investigation.

3.2.8 Issues

The section is not applicable because this site is still under investigation.

3.2.9 Recommendations and Follow-Up Actions

Complete the remedial investigation and feasibility study.

3.2.10 Protectiveness Statement

This site is under the RI phase and so a ROD has not yet been signed for this area; i.e. the remedy for this site has not been selected. A protectiveness determination of the of the remedy at this OU can not be made at this time until further information is obtained. The remedy is expected to be implemented in 2006, at which time a protectiveness determination will be made. Part of this site is being used as a parking lot to store new cars. Building 41 was demolished and the area re-graded and paved by RIEDC in October 2002. The ground water is not being used for any purpose. The leasee is aware of the contamination in the soils, sediments, seeps, and ground water, and has no plans to more intensively occupy the area until the investigations have been completed. The results of the Phase I RI do not indicate immediate unacceptable risk exposure to human health or the environment from the Navy's historical use of the site. Therefore, there is no current exposure to the known contamination. Further investigations are planned to determine the nature and extent of the contamination, and to further assess risk to human health and/or the environment from past Navy activity at the site. The ROD is expected in FY 2005.

3.2.11 Next Review

The next five-year review for the former NCBC Davisville facility that includes Site 03 is required by March 2008, five years from the date of this review.

4. WEST DAVISVILLE

4.1 West Davisville Aircraft Counterweight Discovery and Identification

4.1.1 Introduction

Refer to Section 1.1 for description of the purpose of the five-year review.

4.1.2 Site Chronology

- Prior to the end of WWII – Quonset Hut Manufacturing
- 1970s through 1990 – Navy Tenant - Defense Reutilization and Marketing Office (DRMO), Defense Logistics Agency
- 1995-1998 – EBS Program Review Item 31 – DRMO scrap yard evaluation of data with NFA in 1998
- April 1999 – Property sold to RIEDC without environmental restrictions
- May 2002 – Counterweight discovery, removal, and relocation to Yorktown, Virginia training site
- November 2002 – Final Counterweight Investigation Work Plan (Revision 2) submitted
- December 2002 – Clearing and grubbing of counterweight discovery area in preparation for Spring 2003 investigation field work

4.1.3 Background

4.1.3.1 Physical Characteristics

The area is approximately 16 acres in size within the northern portion of the West Davisville parcel that is shown in Figure 1. The topography of this area is relatively flat, with elevations reported to be less than 50 ft MSL (EA 1995). The ground surface includes grass cover and some trees, asphalt/dirt roadways, and old railroad spurs.

4.1.3.2 Land and Resource Use

As reported in the Final EBS report (EA 1995), between 1941 and 1946, the surface of West Davisville was covered by numerous closely spaced structures on concrete foundations, rail spurs, access roads, and loading docks. Quonset huts were manufactured at West Davisville during this time frame. Between 1950 and 1984, subject area was used by the General Services Administration for the open storage of raw materials including metal ingots. During the late

1970s through 1990, DRMO utilized approximately 12 acres of the area and a portion of Building 314 of West Davisville for storage purposes. DRMO received material from the Department of Defense for reuse. No Nuclear Regulatory Commission (NRC) license was required at the time. Ground water underlying the subject area has been classified by RIDEM as GA (i.e., presumed to be suitable for public or private drinking water use without treatment).

4.1.3.3 History of Contamination

The subject area is located within a portion of the DRMO Scrapyard (EBS Review Item No. 31) and was formerly used by the Defense Reutilization and Marketing Office (DRMO), which received material from the Department of Defense for reuse. Scrap items including old refrigerators, metal cabinets, air conditioners, and car parts were stored through 1992. In addition, this area received hazardous materials/hazardous waste until the mid-1980s. According to NCBC Davisville personnel, there are no known releases associated with this subparcel. Therefore, sampling and analysis of surface and subsurface soil and the advancement of three soil borings were conducted as part of the Phase II EBS investigation of NCBC Davisville (EA 1998d). The analytical program included TCL SVOC, pesticides, PCB, TPH, and TAL metals (subsurface soil samples were also analyzed for TCL VOC). The detected concentrations in surface and subsurface soil samples were below screening criteria, except for three locations where the combined TPH values exceeded 300 mg/kg, a RIDEM criteria. Therefore, additional sampling of surface soil was performed under the Phase II EBS Follow-On Investigation (EA 1998e). The samples were analyzed for TPH, TCL VOC, and TCL SVOC. VOC were not detected. TPH exceeded RIDEM's Class GA Leachability Criterion (500 mg/kg) in samples EBS31-RSS-11 and -13. SVOC exceeded RIDEM's criteria in only one sample (EBS31-RSS-06). SVOC concentrations in the other samples were generally low or not detected. Reinspection of the area did not show evidence of stained soil. It was assumed that the presence of deteriorated pavement accounted for the low concentrations of TPH and SVOC detected in the soil samples. Even so, it was recommended that limited soil removal be conducted at those three sample locations (EBS-31-RSS-06, EBS-31-RSS-11, and EBS-31-RSS-13). The limited soil removal action and confirmatory sampling was completed by FWENC (FWENC 1998b). Based on the low results, EBS Review Item No. 31 was recommended for NFA and concurrence was received from EPA and RIDEM in January 1998.

4.1.3.4 Initial Response

During 1997, there was a limited removal action of TPH-contaminated soil (FWENC 1997c).

On 2 May 2002, the Navy received a telephone call from the RIEDC about an object discovered by Narragansett Electric during a power pole installation. The object was labeled as "Uranium – high salvage value." The electric company notified the NRC and the Rhode Island Department of Health (RIDOH) of the finding. A consultant to Narragansett Electric found two more of the objects within about 30 ft of the first one, with all three located approximately 4 in. to 6 in. below ground surface. A representative of the Navy's Radiological Affairs Support Office (RASO) arrived onsite quickly for preliminary assessment and identified the objects as depleted uranium aircraft counterweights. Such material is still being used as counterweights in aircraft

and is also used, for example, in yacht keels. RASO took possession of the counterweights from Narragansett Electric and is currently utilizing them as training aids in Yorktown, VA. Each of the counterweights, including the aluminum frame portion, is approximately 18 in. by 7 in. by 5 in. in size, and weighs approximately 50 lb.

In November of 2002, a final health and safety plan and a work plan (revision 2) prepared by New World Technology were submitted to the EPA and RIDEM with RASO concurrence.

The site area was cleaned and grubbed during early December 2002. Because of the severe winter weather conditions, the survey fieldwork is planned for April 2003 and will require approximately 5 weeks to complete. Only counterweights and potentially luminescent gauges/dials located in the top 6 in. of the surface will be removed under this survey plan. Additional removal may be required depending on the analysis of the survey data.

4.1.3.5 Basis for Taking Action,

Although this is only low-level radioactive material, the Navy wants to assess and confirm the site extent. RIDOH reported that there was no related risk to the site workers.

Uranium is a hazardous substance as defined under CERCLA §101 (14) which refers to any hazardous pollutant listed in §112 of the Clean Air Act, 42 USC 7412. Therefore, on 8 May 2002, EPA requested the Navy investigate the nature and extent of contamination in both the soils and groundwater. The Navy will be performing investigative field work in the Spring of 2003.

4.1.4 Remedial Actions

The section is not applicable because this area is still under investigation.

4.1.4.1 Remedy Implementation

The section is not applicable because this area is still under investigation.

4.1.4.2 System Operation/Operation and Maintenance

The section is not applicable because this area is still under investigation.

4.1.5 Progress Since the Last Five-Year Review

This is the first five-year review for this area.

4.1.6 Five-Year Review Process

4.1.6.1 Administrative Components

Refer to Section 1.1.

4.1.6.2 Community Involvement

Refer to Section 1.1.

4.1.6.3 Document Review

Documents reviewed are referenced in this Section 4.1 and the citations are included in the List of References.

4.1.6.4 Data Review

No data has been gathered at this site as of the first five-year review.

4.1.6.5 Site Inspections

No inspections have occurred because this site is still under investigation

4.1.6.6 Interviews

The section is not applicable because this area is still under investigation.

4.1.7 Technical Assessment

The section is not applicable because this area is still under investigation.

4.1.8 Issues

The section is not applicable because this area is still under investigation.

4.1.9. Recommendations and Follow-Up Actions

Complete the investigation and make a decision whether to create another study area under the IR Program in accordance with FFA §31.2.

4.1.10 Protectiveness Statement

A protectiveness determination cannot be made at this time until further information is obtained. Further information will be obtained from the investigative field work planned for Spring 2003. A protectiveness determination will be made once the investigation is completed.

4.1.11 Next Review

The next five-year review for the former NCBC Davisville facility that includes this area is required by March 2008, five years from the date of this review.

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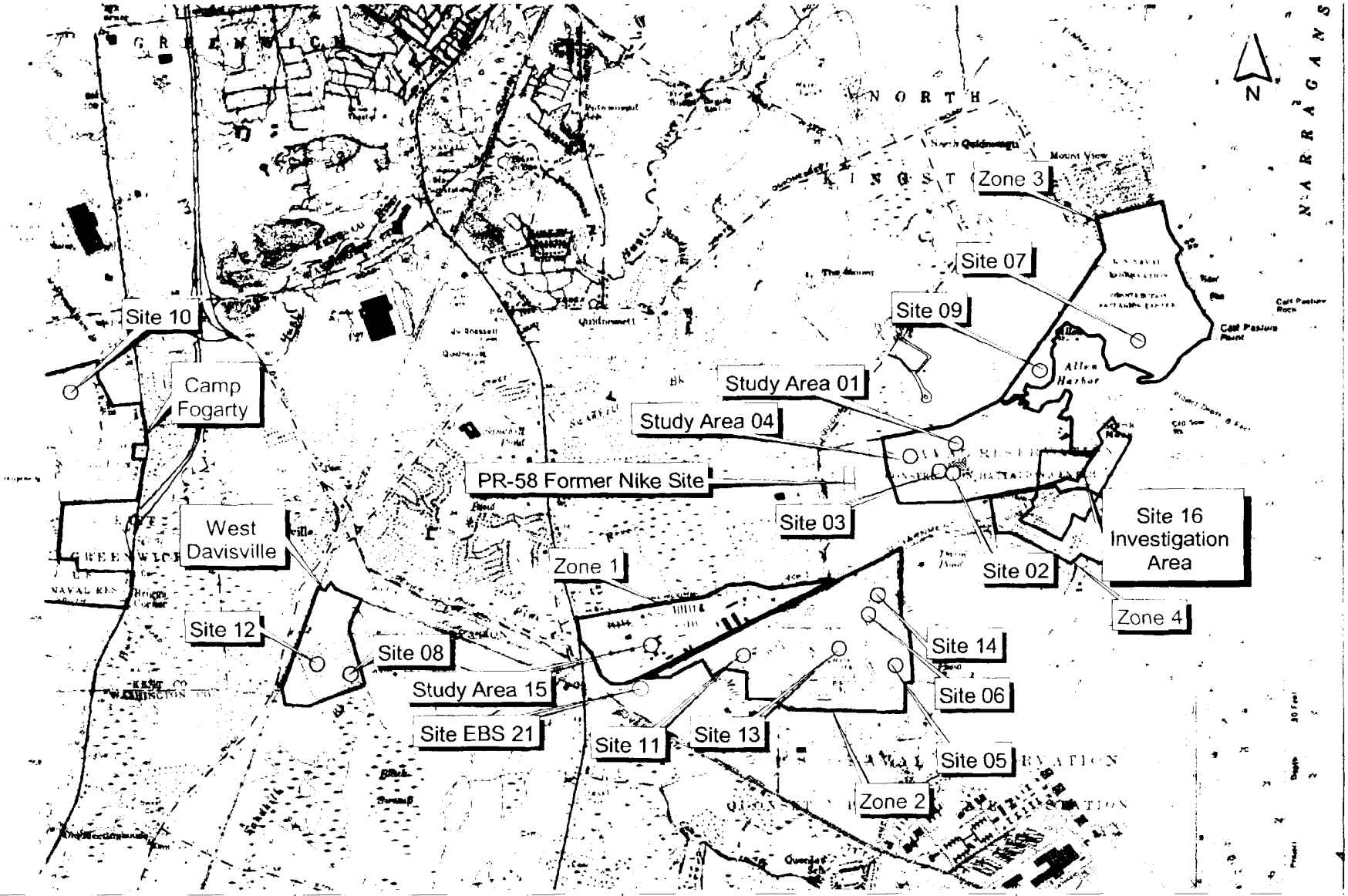

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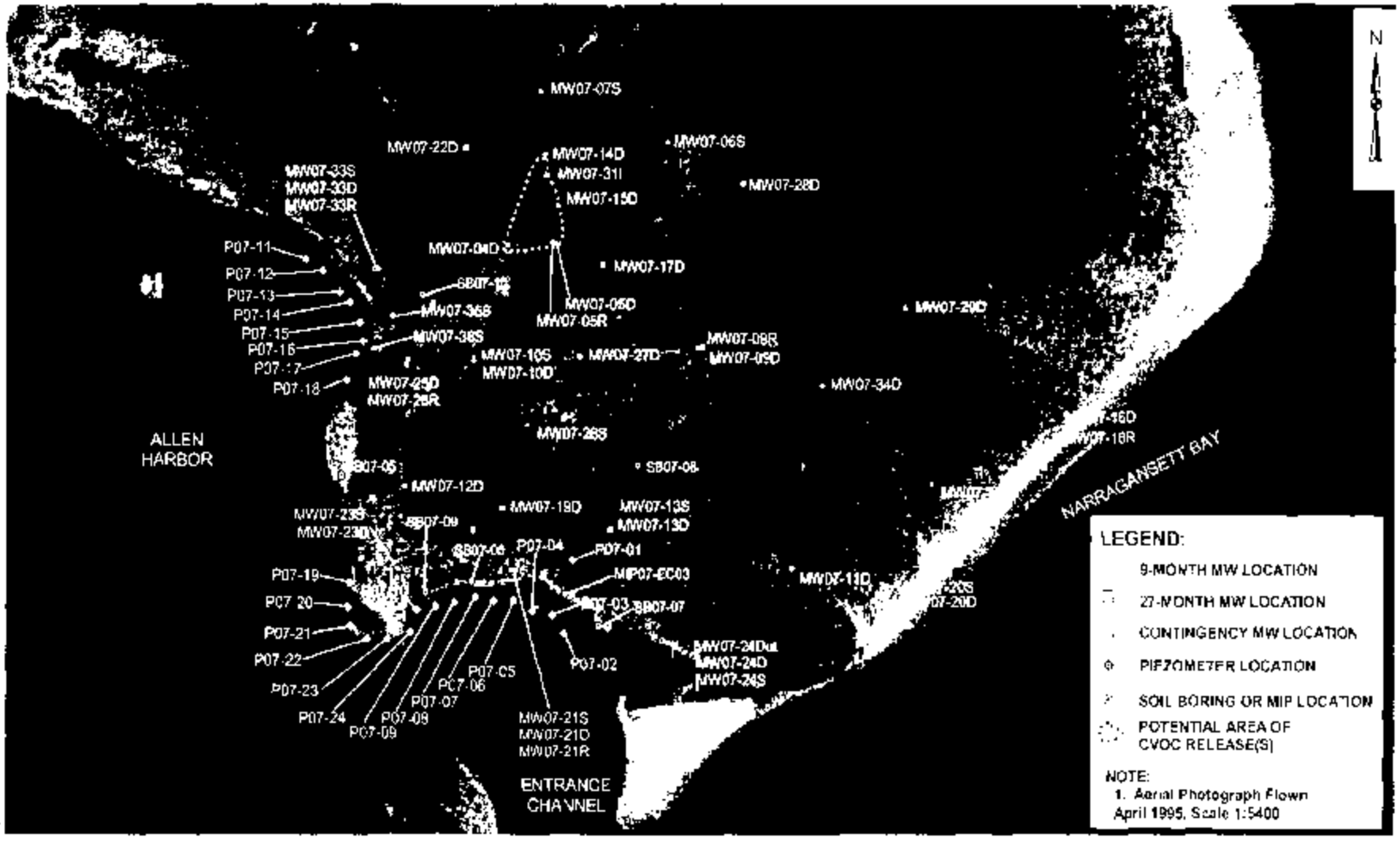
FIVE-YEAR REVIEW REPORT
FORMER NCBC DAVISVILLE FACILITY
NORTH KINGSTOWN, RHODE ISLAND

SITE LOCUS MAP

FIGURE 1



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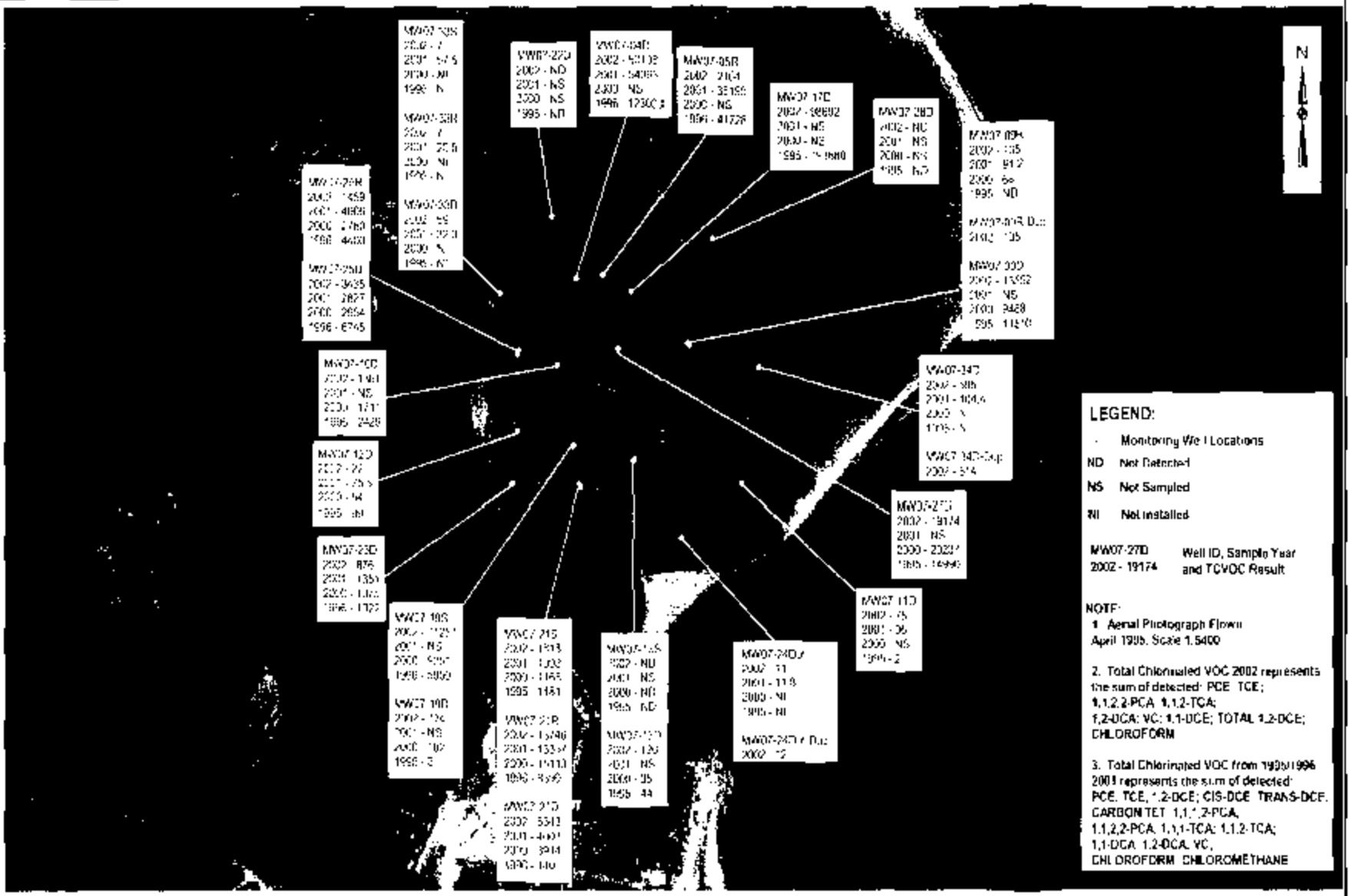
CRANE
FIVE-YEAR REVIEW REPORT
FORMER NCBC DAVISVILLE FACILITY
NORTH KINGSTOWN, RHODE ISLAND

SITE 07 MAP AND LONG TERM MONITORING PROGRAM MONITORING WELL AND PIEZOMETER SAMPLE LOCATIONS

FIGURE 2



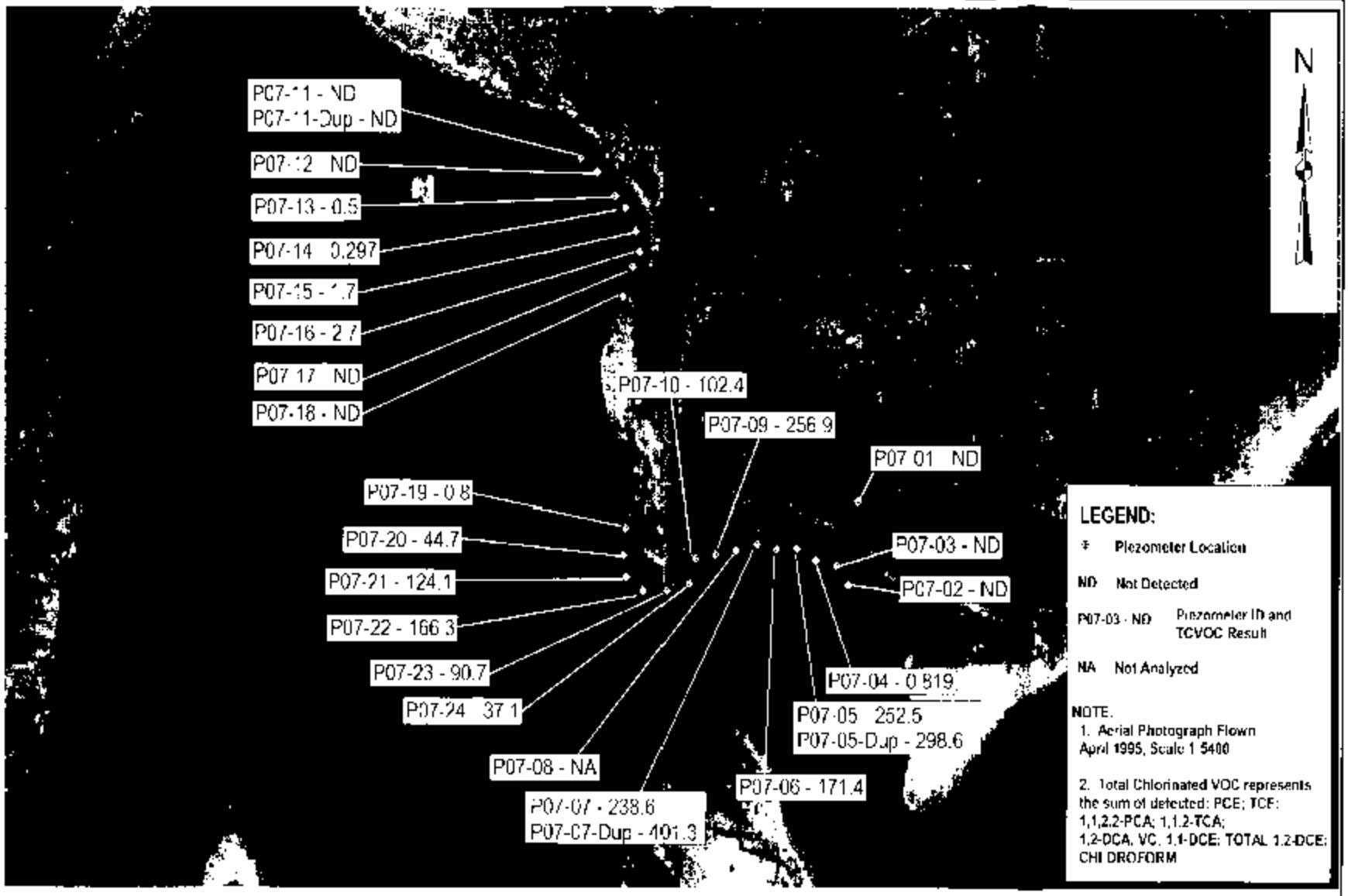
EA ENGINEERING, SCIENCE, AND TECHNOLOGY

200 0 200 Feet

EHANE
FIVE-YEAR REVIEW REPORT
FORMER NCBC DAVISVILLE FACILITY
NORTH KINGSTOWN, RHODE ISLAND

SITE 07 - TOTAL CHLORINATED VOLATILE ORGANIC COMPOUNDS (UG/L) DETECTED IN GROUND-WATER SAMPLES FROM MONITORING WELLS DECEMBER 1995/MAY 1996 (PHASE III R), AUGUST 2000, AUGUST 2001 (ME 01), MAY 2002 (VE 02)

FIGURE 3A



EA ENGINEERING, SCIENCE, AND TECHNOLOGY

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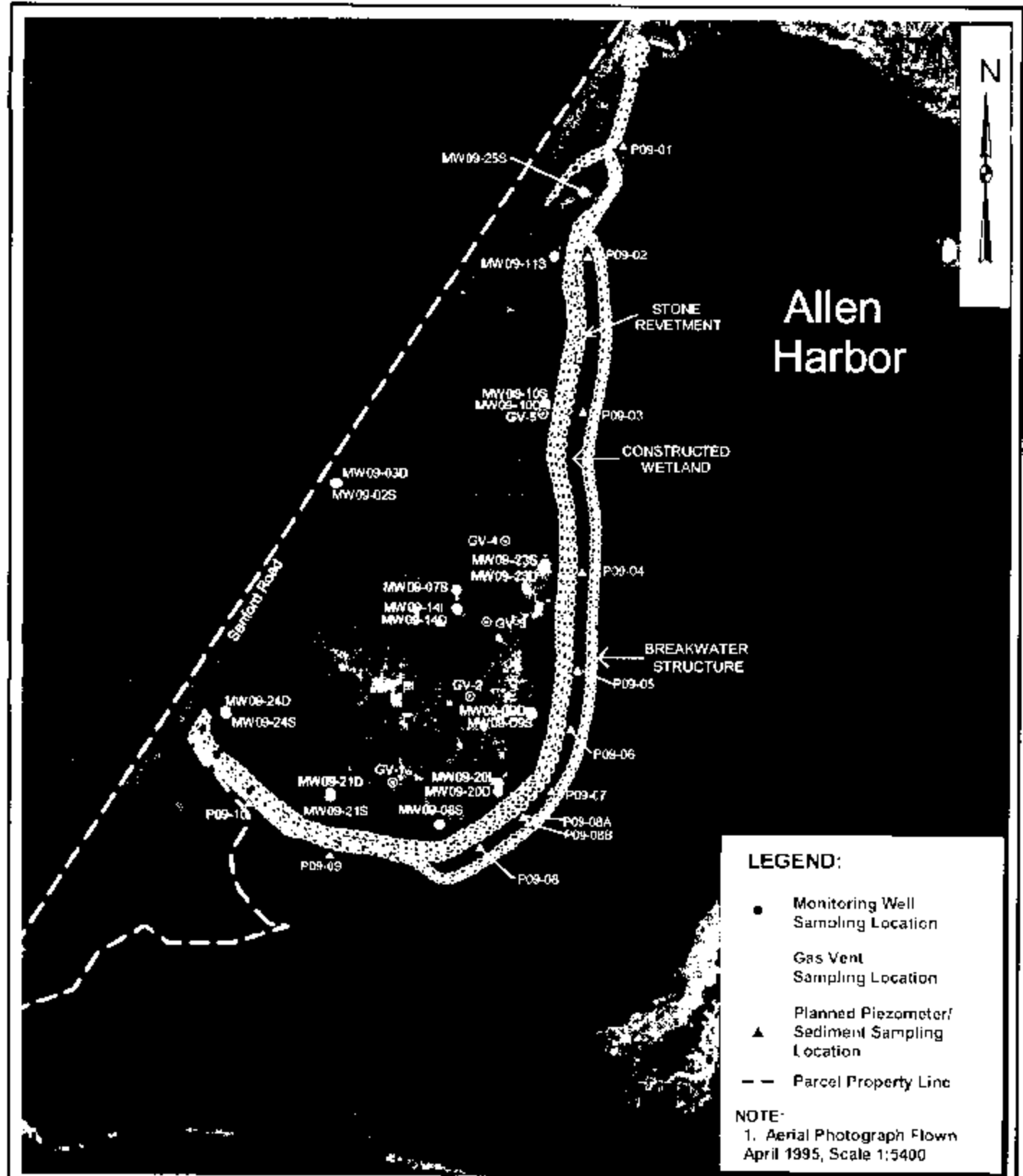
EFANE
FIVE-YEAR REVIEW REPORT
FORMER NCBC DAVISVILLE FACILITY
NORTH KINGSTOWN, RHODE ISLAND

SITE 07 - TOTAL CHLORINATED VOLATILE ORGANIC COMPOUNDS (UG/L) DETECTED IN GROUND-WATER SAMPLES FROM PIEZOMETERS MAY 2002 (ME 02)

FIG. SE-7B



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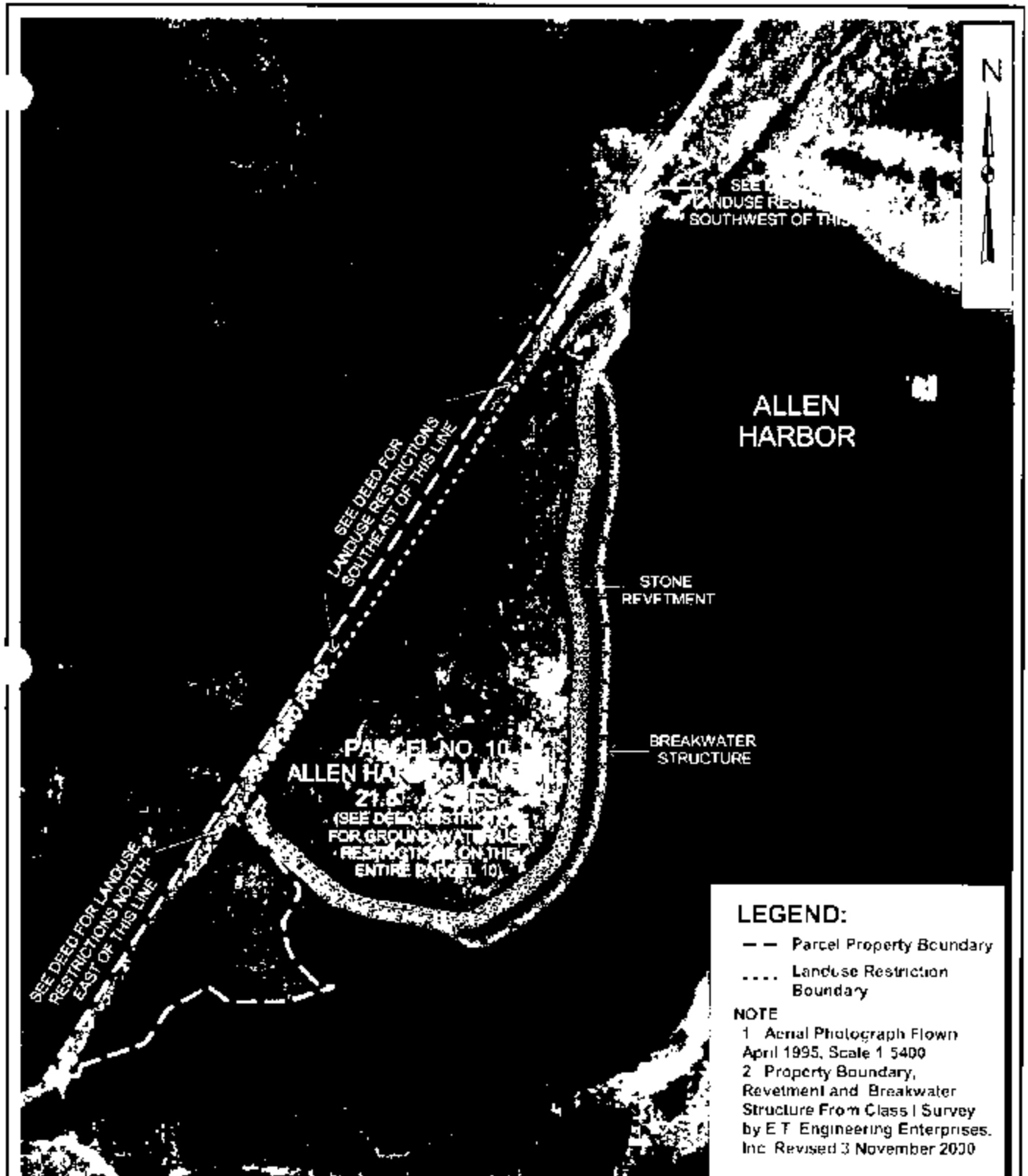
SITE 09 MAP AND LONG-TERM MONITORING PROGRAM SAMPLE LOCATIONS

FIGURE 1



EA ENGINEERING SCIENCE AND TECHNOLOGY

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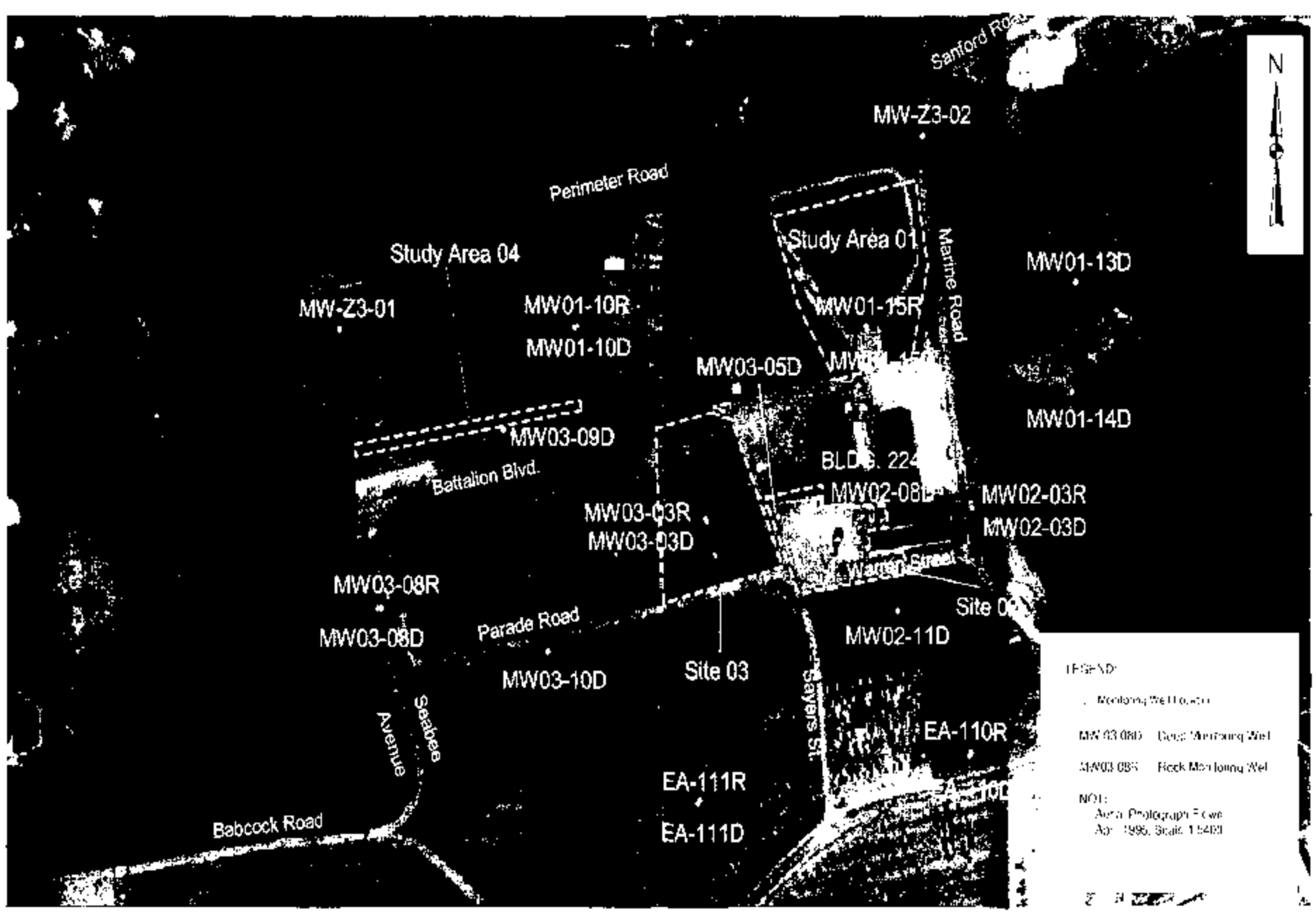
FIVE YEAR REVIEW REPORT
FORMER NCUC DAVISVILLE FACILITY
NORTH KINGSTOWN RHODE ISLAND

SITE MAP
PARCEL NO 10

FIGURE 5



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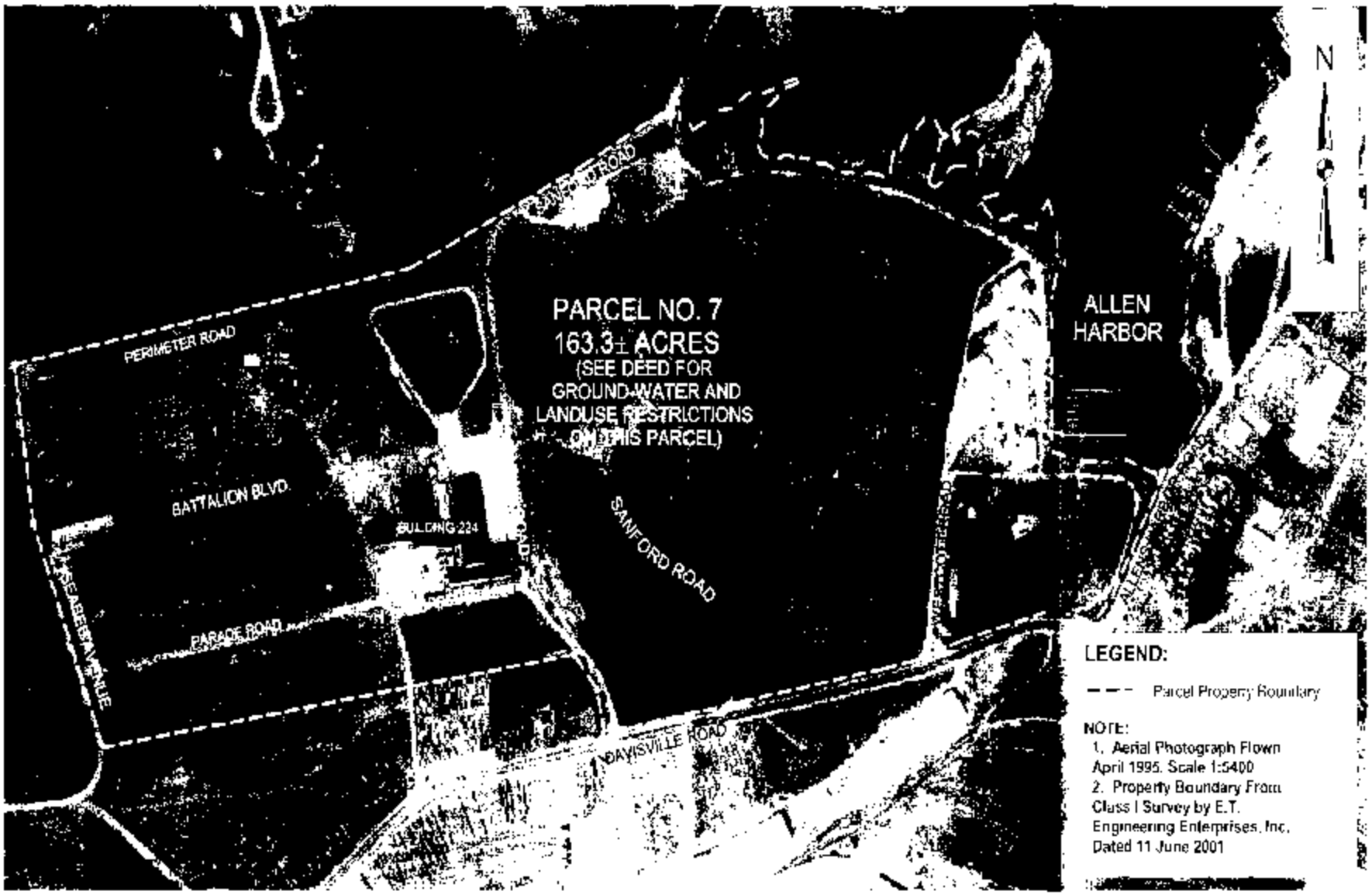
FIFTH
FIVE YEAR REVIEW REPORT
FORMER NAVAL AIR FACILITY
MIDDLETOWN, RHODE ISLAND

LOCATION OF MONITORING WELLS FOR SITE 03 INTERIM GROUND WATER SAMPLING EVENTS

FIGURE 6



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ETANE
FIVE-YEAR REVIEW REPORT
FORMER NCBC DAVISVILLE FACILITY
NORTH KINGSTOWN, RHODE ISLAND

SITE MAP
PARCEL NO. 7

FIGURE 7

FIGURE 1

SITE MAP

FIVE-YEAR REVIEW REPORT
FORMER NORTH DAVISVILLE FACILITY
NORTH KINGSTOWN, RHODE ISLAND

PLAN

FOSTER WHEELER ENVIRONMENTAL SCIENCE AND TECHNOLOGY, INC.

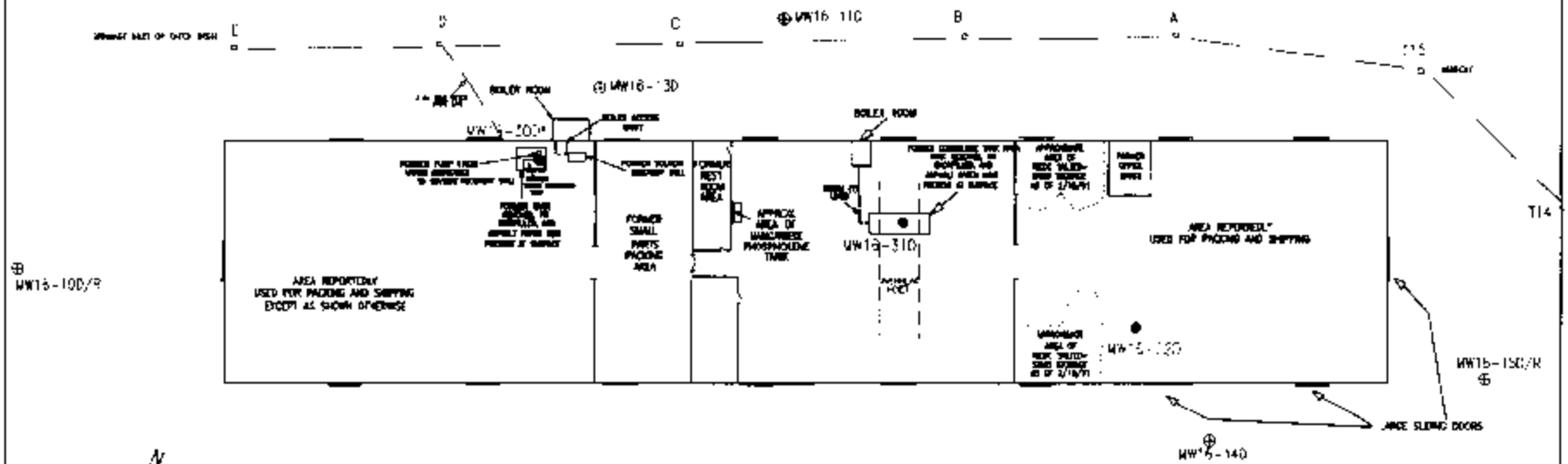
EA ENGINEERING SCIENCE AND TECHNOLOGY

0 200 Feet

PHASE II ASSESSMENT REPORT
FORMER NIKE BASE WELLESLEY
NORTH KINGSTOWN, RHODE ISLAND

SITE MONITORING WELL LOCATION MAP

FIGURE 9



MW16-320 ● PHASE II RI MONITORING WELL

MW16-120 ⊕ PHASE I RI MONITORING WELL

EA ENGINEERING, SCIENCE, AND TECHNOLOGY	DESIGNED BY JS	DRAWN BY RC/JR	DATE 12/17/02	PROJECT NO. 29600.99	LEAD AGENCY PROJECT MANAGER	EFANE FIVE-YEAR REVIEW REPORT
	CHECKED BY JS	PROJECT MGR. JS	SCALE AS SHOWN	DRAWING NO. -	FIGURE 10	FORMER BUILDING 41 FLOOR PLAN AND MONITORING WELL LOCATION MAP

TABLE 1 SUMMARY OF DETECTED ANALYTES EXCEEDING PROJECT ACTION LEVELS IN GROUND-WATER SAMPLES FROM MONITORING WELLS SITE 09 ALLEN HARBOR LANDFILL

Analyte (Project Action Level* in µg/L)	Analyte Concentration (µg/L)			
	Monitoring Event 01 Dec 2001–Jan 2002	Monitoring Event 02 Feb–Mar 2002	Monitoring Event 03 Jun 2002	Monitoring Event 04 Sep 2002
VOLATILE ORGANIC COMPOUND				
1,1,2-TCA (5)				
MW09-20I	3,300J	3,200J	38,000J	NE
1,1-DCE (7)				
MW09-20I	NE	280J	6,400J	590J
Benzene (5)				
MW09-07S	58	69	54J	46
MW09-20I	NE	8J	130J	11
MW09-21S	25/24 Dup	20	20J	23
MW09-25S	6.46	42	12	7.03
MW09-09S	NE	NE	5.07	NE
Chlorobenzene (100)				
MW09-11S	300	230	NE	NE
Chloroform (80)				
MW09-20I	NE	83J	1,300J	94J
cis-1,2-DCE (70)				
MW09-03D	130	140	150J	120
MW09-20I	45,000	9,100E	120,000J	27,000
MW0921D	1,200	850E	740J	570
MW09-09S	NE	NE	120J	NE
Methylene chloride (5)				
MW09-20I	NE	NE	130J	5.44
trans-1,2-DCE (100)				
MW09-20I	21,000	8,100E	56,000J	16,000
Tetrachloroethane (5)				
MW09-20I	NE	180J	3,500J	320J
Trichloroethane (5)				
MW09-03D	7.29	<7J	6J	6.62
MW09-08S	6.28	<5	<1	NE
MW09-20I	420,000	420,000	510,000J	480,000
MW09-21D	500	320	210J	120
Vinyl chloride (2)				
MW09-03D	26	17	16J	24
MW09-08S	23	19/20 Dup	17J	12J
MW09-09S	38	2I	62J	16
MW09-10S	2.23	2J	NE	NE
MW09-20I	3,000J	1,800J	17,000J	1,400J
MW09-21D	44	44	44J	44

NOTES: J = Estimated.
NE = No Exceedance.
E = Exceeded calibrated analytical range of instrument.
* Project Action Level = MCL, unless RIDEM GA goal is more stringent.

Analyte (Project Action Level* in µg/L)	Analyte Concentration (µg/L)			
	Monitoring Event 01 Dec 2001–Jan 2002	Monitoring Event 02 Feb–Mar 2002	Monitoring Event 03 Jun 2002	Monitoring Event 04 Sep 2002
SEMIVOLATILE ORGANIC COMPOUNDS				
Bis(2-ethyhexyl)phthalate (6)				
MW09-10S	NE	NE	57	<10U/<10U Dup
MW09-10D	NE	NE	25/27 Dup	<10U
MW09-21D	NE	NE	NE	13
MW09-23S	NE	NE	46J	NE
MW09-23D	NE	NE	59J	NE
MW09-24D	NE	NE	NE	8
POLYCYCLIC AROMATIC HYDROCARBONS				
Naphthalene (20)				
MW09-07S	23J	NE	23J	NE
Pesticides	NE	NE	NE	NE
Polychlorinated Biphenyl	NE	NE	NE	NE
Metals (Dissolved)				
Antimony (6)				
MW09-14D	NE	NE	6.8	7.1J
MW09-20I	NE	NE	6.75	7.6J
MW09-24D	NE	NE	NE	7.7J
MW09-24S	NE	NE	23.6	20
MW09-25S	NE	NE	12.8	<8.7U
Arsenic (10)				
MW09-03D	NE	NE	NE	10J
MW09-07S	13.4	NE	21.4	30J
MW09-08S	NE	NE	10.1	NE
MW09-10D	NE	NE	10.2	NE
MW09-10S	NE	NE	13	NE
MW09-20D	NE	NE	NE	11J
MW09-23S	NE	<100U	NE	17J
MW09-24D	15.4	NE	17	21J
Chromium (100)				
MW09-11S	NE	NE	314	NE
Nickel (100)				
MW09-11S	NE	NE	202	NE

TABLE 2 SUMMARY OF DETECTED ANALYTES EXCEEDING PROJECT ACTION LEVELS IN WATER SAMPLES FROM PIEZOMETERS SITE 09 ALLEN HARBOR LANDFILL

Analyte (PAL* in µg/L)	Analyte Concentration (µg/L)			
	Monitoring Event 01 Dec 2001–Jan 2002	Monitoring Event 02 Feb–Mar 2002	Monitoring Event 03 Jun 2002	Monitoring Event 04 Sep 2002
Volatile Organic Compounds No PAL*	Only P09-02 thru P09-07 sampled	Only P09-04 and P09-07 sampled	Only P09-02 and P09-10 sampled	Only P09-02, P09-04 thru P09-10 sampled
Semivolatile Organic Compounds	NE – only P09-02 thru P09-06 sampled	NE – only P09-04 sampled	NE – only P09-06 And P09-10 sampled	NE – P09-02 thru P09-05 and P09-10 sampled
Polycyclic Aromatic Hydrocarbons No PAL*	only P09-03 thru P09-07 and P09-10 sampled	only P09-04 and P09-07 sampled	P09-02 thru P09-05, P09-08, and P09-10 sampled	P09-02 thru P09-07 and P09-10 sampled
Pesticides	ND but DLs>9 PALs P09-02 thru P09-10 sampled	NS	ND but DLs>9 PALs Only P09-10 sampled	ND but DLs>9 PALs P09-02 thru P09-06, P09-09 and P09-10 sampled
Polychlorinated Biphenyls	P09-01, P09-03 thru P09-08, and P09-10 sampled	NS	Only P09-02, P09-04, P09-05, and P09-10 sampled	P09-01 thru P09-06, P09-09 and P09-10 sampled
Total PCB (0.03)	DLs>PAL		DLs>PAL	DLs>PAL
Metals (Dissolved)	10 locations sampled	P09-01, P09-04, and P09-07 sampled	10 locations sampled	10 locations sampled
Arsenic (36)	DL>PAL	DL>PAL		
P09-01	<100U	<100U	NE	NE
P09-02	<50U	NS	NE	NE
P09-03	NE	NS	NE	NE
P09-04	NE	<100U	NE	NE
P09-05	<100U	NS	NE	NE
P09-06	<50U	NS	NE	NE
P09-07	NE	<100U	NE	NE
P09-08	<100U	NS	NE	NE (P09-08A)
P09-09	NE	NS	NE	NE
P09-10	188	NS	NE	NE
Chromium (50)		DL>PAL	DL>PAL	
P09-01	29,200	<128U	1,670	180J
P09-02	1,550	NS	916	NE
P09-03	67.7	NS	988	60J
P09-04	NE	177	640	NE
P09-05	300	NS	619	290J
P09-06	1,400	NS	978	300J
P09-07	NE	<128U	2,140	1,700J
P09-08	168	NS	<53U	430J (P09-08A)
P09-09	NE	NS	NE	NE
P09-10	1,230	NS	285	NE

NOTE: PAL = Project Action Level (AWQC, September 1999).
NE = No exeedance.
ND = Not detected.
DL = Detection limit.
NS = Not sampled
J = Estimated.

Analyte (PAL* in µg/L)	Analyte Concentration (µg/L)			
	Monitoring Event 01 Dec 2001–Jan 2002	Monitoring Event 02 Feb–Mar 2002	Monitoring Event 03 Jun 2002	Monitoring Event 04 Sep 2002
Metals (Dissolved) (Continued)				
Copper (2.9)	DL>PAL	DL>PAL	DL>PAL	DL>PAL
P09-01	492	<174U	160	<39U
P09-02	<87U	NS	37	<17U
P09-03	21.4	NS	<5.9U	<23U
P09-04	19.3	<174U	<5.9U	<46U
P09-05	<174U	NS	160	120
P09-06	<87U	NS	<5.9U	89
P09-07	<43.5U	<174U	52	81
P09-08	206	NS	71	320 (P09-08A)
P09-09	<8.7U	NS	<5.9U	<15U
P09-10	1,400	NS	46	<11U
Lead (8.1)	DL>PAL	DL>PAL		
P09-01	186	<36U	81.2	17
P09-02	<18U	NS	84.3	NE
P09-03	10.2J	NS	275	17
P09-04	<8.5R	<36U	NE	10
P09-05	84.1	NS	29.3	57
P09-06	158	NS	NE	24
P09-07	<9U	<36U	70.8	34
P09-08	9.3	NS	NE	170 (P09-08A)
P09-09	NE	NS	105	NE
P09-10	560	NS	86.8	9.7
Mercury (0.08)				DL>PAL
P09-01	NE	NE	NE	0.26J
P09-02	NE	NS	NE	0.31J
P09-03	NE	NS	NE	0.4J
P09-04	NE	NE	NE	0.41J
P09-05	NE	NS	NE	0.51J
P09-06	NE	NS	NE	<0.2U
P09-07	NE	NE	NS	0.425
P09-08	1.4	NS	NE	NS (P09-08A)
P09-09	NE	NS	NE	0.36J
P09-10	0.74	NS	NE	<0.19U
Nickel (8.3)	DL>PAL	DL>PAL		DL>PAL
P09-01	2,900	<146U	522	<47U
P09-02	585	NS	543	<14U
P09-03	41.9	NS	536	<53U
P09-04	16	<146U	267	65
P09-05	153	NS	327	280
P09-06	800	NS	494	210
P09-07	<36.5U	<146U	1,250	990
P09-08	197	NS	12.1	950 (P09-08A)
P09-09	14.1J	NS	81.8	NE
P09-10	3,050	NS	183	NE

Analyte (PAL* in µg/L)	Analyte Concentration (µg/L)			
	Monitoring Event 01 Dec 2001–Jan 2002	Monitoring Event 02 Feb–Mar 2002	Monitoring Event 03 Jun 2002	Monitoring Event 04 Sep 2002
Metals (Dissolved) (Continued)				
Zinc (81)		DL>PAL		
P09-01	1,230	<142U	810	NE
P09-02	NE	NS	250	NE
P09-03	NE	NS	1,600	NE
P09-04	NE	<142U	NE	NE
P09-05	267	NS	550	260
P09-06	602	NS	150	610
P09-07	NE	<142U	380	150
P09-08	409	NS	650	690 (P09-08A)
P09-10	1,320	NS	240	NE

TABLE 3 SUMMARY OF SALINITY DATA FOR WATER FROM PIEZOMETERS SITE 09 ALLEN HARBOR LANDFILL

Sample Designation	Salinity (ppth) – Field Measured/Laboratory Analysis			
	Monitoring Event 01 Dec 2001–Jan 2002	Monitoring Event 02 Feb–Mar 2002	Monitoring Event 03 Jun 2002	Monitoring Event 04 Sep 2002
P09-01	20.96/NA	15.98/NA	23.76/NA	29.44/NA
P09-02	29.79/29.5J	NS	30.53/NA	28.75/24.2J
P09-03	30.14/26.1J	NS	25.76/NA	0.24/23.1J
P09-04	30.79/28J	28.43/NA	28.88/NA	0.56/23.9J
P09-05	29.04/28J	NS	30.33/NA	0.33/25.3J
P09-06	30.19/26.5J	NS	29.70/NA	21.54/NA
P09-07	NM/NA	26.19/NA	22.79/NA	22.70/NA
P09-08	NM/NA	NS	NM/NA	23.61/NA
P09-09	NM/NA	NS	NM/NA	NM/NA
P09-10	NM/NA	NS	13.32/<2	NM/2.44J

NOTES ppth = Parts per thousand.
NA = Not analyzed (insufficient sample volume).
J = Estimated.
NS = Not sampled.
NM = Not measured (insufficient water volume yielded by peizometer).

TABLE 4 SUMMARY OF DETECTED ANALYTES EXCEEDING PROJECT ACTION LEVELS IN SEDIMENT SAMPLES SITE 09 ALLEN HARBOR LANDFILL

Analyte (PAL* in µg/L)	Analyte Concentration (µg/L)			
	Monitoring Event 01 Dec 2001–Jan 2002	Monitoring Event 02 Feb–Mar 2002	Monitoring Event 03 Jun 2002	Monitoring Event 04 Sep 2002
Volatile Organic Compounds – No PAL				
Semivolatile Organic Compounds – No PAL				
Polycylic Aromatic Hydrocarbons				
Anthrecene (1,100)				
SED09-10	NE	NE	NE	3,300J
Benzo(a)anthracene (1,600)				
SED09-10	NE	NE	NE	5,700J
Benzo(a)pyrene (1,600)				
SED09-10	NE	NE	NE	3,300J
Chrysene (2,800)				
SED09-10	NE	NE	NE	6,300J
Fluoranthene (5,100)				
SED09-10	NE	NE	NE	16,000J
Flourene (540)				
SED09-10	NE	NE	NE	2,500J
Penanthrene (1,500)				
SED09-10	NE	NE	NE	18,570J
Pyrene (2,600)				
SED09-10	NE	NE	NE	12,190J
Total PAH (44,792)				
SED09-10	NE	NE	NE	77,260
Pesticides				
4,4-DDE (7.65)				
SED09-09	NE	NE	9.5	NE
4,4-DDT (6)				
SED09-01	62J	NE	NE	NE
SED09-09	<6.9U	<6.1U	<6.2U	<6.3U
Alpha-chlordane (6)				
SED09-01	ME	ME	21	NE
Polychlorinated Biphenyls				
Total PCB (215)				
SED09-01	1,600	220	NE	910
Metals	NE	NE	NE	NE

NOTE: PAL = Project Action Level (Effects Range Median, September 1999, except for 4,4-DDE, Total PCB, and zinc that are from the Conceptual Long-Term Monitoring Plan [NewFields 2000b]).
NE = No exceedence.

APPENDIX A

NO FURTHER ACTION SITES

1. INTRODUCTION

Appendix A has been included in the first five-year review of the former NCBC Davisville facility to document the status of the nine Sites and Study Area for which "No Further Action" (NFA) has been determined through investigation or removal action (Sites 05, 06, 08, 10, 11, 12, 13, and 14, and Study Area 15). Their locations are shown on Figure 1 of the Five-Year Review Report.

2. SITE 05 TRANSFORMER OIL DISPOSAL AREA

2.1 SITE LOCATION AND DESCRIPTION

Site 05 is a relatively flat, overgrown area to the east of Building 37, outside the fence adjacent to Camp Avenue. A north-south ridge is located on the eastern side of the site. Site 05 is located on the 248-acre Warehouse Triangle parcel. This parcel was sold to the Rhode Island Economic Development Corporation (RIEDC) in January 2000.

2.2 HISTORY OF CONTAMINATION

In 1968 or 1969, approximately 30 gal of transformer oil containing polychlorinated biphenyls (PCB) were reportedly disposed of on the ground within the identified 1,500 ft^2 site area. The general site location was identified during interviews conducted as part of the Initial Assessment Study in 1984. A surface soil sample collected from the area in October 1984 indicated the presence of PCB at 6 parts per million (ppm). No ground-water investigation was performed at this site.

2.3 SUMMARY OF RISK ASSESSMENT

The results of the Human Health Risk Assessment (HHRA) present and future use using a residential exposure scenario determined a cancer risk of less than 1×10^{-4} and a Hazard Index (HI) of less than 1. These low risks were mostly caused by exposures to polycyclic aromatic hydrocarbons (PAH), DDT, arsenic, and beryllium in the soils found during the 1985, 1986, and 1993 Remedial Investigations (RIs).

The results of the 1995 ecological risk assessment (ERA) concluded that Site 05 does not pose a risk to the aquatic or terrestrial communities in the Hall Creek Watershed where Site 05 is located.

RIDEM Remediation Regulation Method 1 criteria was met.

2.4 REMEDY SELECTED

A No Further Action (NFA) Record of Decision (ROD) was signed in September 1995 based on residential risk-based analysis. This remedy is protective of human health and the environment. As stated in the ROD, a 5-year site review will not be conducted because the site is suitable for unrestricted use.

RIDEM concurred with the NFA decision for this site.

3. SITE 06 SOLVENT DISPOSAL AREA

3.1 SITE LOCATION AND DESCRIPTION

Site 06 is a relatively flat, grassy area in the Warehouse Triangle between former Building 67 and Warehouse 38, covering roughly 0.25 acre. It is bounded to the east by Exeter Street and to the west by a paved parking lot, and is located approximately 600 ft west of Hall Creek and 1 mile west of Narragansett Bay. The Warehouse Triangle has been sold to RIEDC for use as part of the Davisville-Quonset Industrial Park. Deed transfer took place in January 2000.

3.2 HISTORY OF CONTAMINATION

Site 06 was reportedly used from 1970 to 1972 for the disposal of waste chlorinated hydrocarbon solvents. Personnel reportedly drained over a dozen 5-gal cans of various liquid wastes in this area about every 3 weeks, for an estimated total disposal volume of 1,750 gal. Disposal reportedly took place in an approximately 30-ft^2 area. Site 06 was a sandy area during the time of these disposal practices. The area was subsequently covered with approximately 6 in. of soil and re-seeded.

3.3 SUMMARY OF RISK ASSESSMENT

The results of the HHRA present and future use using a residential exposure scenario determined a cancer risk of less than 1×10^{-4} and an HI of less than 1. These low risks were mostly caused by exposures to PAH, arsenic, and beryllium in the soils, and lead in ground water found during the 1985, 1986, and 1993 RIs.

The results of the ERA concluded that Site 06 does not pose a risk to the aquatic or terrestrial communities in the Hall Creek Watershed, where Site 06 is located.

RIDEM Remediation Regulation Method 1 criteria was met.

3.4 REMEDY SELECTED

An NFA ROD was signed in September 1998 based on residential risk-based analysis. This remedy is protective of human health and the environment. As stated in the ROD, a five-year site review will not be conducted because the site is suitable for unrestricted use.

RIDEM concurred with the NFA decision for this site.

4. SITE 08 DEFENSE PROPERTY DISPOSAL OFFICE (DPDO) FILM PROCESSING DISPOSAL AREA

4.1 SITE LOCATION AND DESCRIPTION

West Davisville is a 70-acre parcel of land located west of the Main Center. West Davisville has been sold to the RIEDC. Deed transfer took place in April 1999. Site 08, the DPDO Film Processing Disposal Area, is located in West Davisville adjacent to Building 314, the DPDO warehouse. Site 08 is characterized by a flat grass-covered area with a 10-ft wide paved road passing through the center of it. Site 08 surface water runoff is toward the east and Sandhill Brook.

4.2 HISTORY OF CONTAMINATION

The site, an area of approximately 80 ft x 40 ft, was reported to have received runoff from a silver recovery machine. For a 6-month period during 1973, the DPDO recovered silver from photographic wastes. Waste liquids from this recovery process were reportedly discharged onto the pavement outside Building 314 and would run off onto the surrounding grass. A surface soil sample was collected from the area in 1985 indicated the presence of silver near background levels. In 1990 and 1993 soil sampling was conducted and detected silver at 28 ppm and 0.47 ppm, respectively. Ground water was sampled in 1993. Low concentrations of volatile organic compounds (VOC) and a semi-volatile organic compound (SVOC) were found. Several metals were also detected, none above maximum contaminant level (MCL). One metal, manganese, was above the Secondary Maximum Contaminant Level. A comprehensive evaluation of the ground water at the Naval Construction Battalion Center (NCBC), including Site 08, was performed in 1996. Previous ground-water sampling results were compiled and used to assess the condition of the ground water at NCBC. The conclusion was that manganese is naturally elevated across NCBC.

4.3 SUMMARY OF RISK ASSESSMENT

The results of the HHRA present and future use using a residential exposure scenario determined a cancer risk of less than 1×10^{-4} and an HI of less than 1. These low risks were mostly caused by exposures to PAH, PCB, arsenic, and beryllium in the soils. Ground water ingestion was evaluated only under a future residential site use scenario as a worst case basis, since the area is close to the well head protection area of the Hunt River Sole Source Aquifer. The estimated cancer risk associated with exposure to the ground water is less than 1×10^{-4} and an HI of 7 due to the slightly elevated levels of manganese. The results of the ERA concluded that Site 08 does not pose a risk to the aquatic or terrestrial communities in the Sandhill Brook Watershed, where Site 08 is located.

RIDEM Remediation Regulation Method 1 criteria was met.

4.4 REMEDY SELECTED

An NFA ROD for soils was signed in September 1995 based on residential risk-based analysis. An NFA ROD was signed in June 1998 for ground water. This remedy is protective of human health and the environment. As stated in the ROD, a five-year site review will not be conducted because the site is suitable for unrestricted use.

RIDEM concurred with the NFA decision for this site.

5. SITE 10 CAMP FOGARTY DISPOSAL AREA

5.1 SITE LOCATION AND DESCRIPTION

Camp Fogarty is a 375-acre parcel of land located about 4 miles west of the Main Center, in East Greenwich, Rhode Island. The area was originally known as Sun Valley, and contained more than 6,000 acres which were taken by eminent domain. During World War II, it was used for military training of the Naval Construction Force personnel. Following the war, all but 375 acres were transferred back to the original owners. The remaining area was used for Seabee military training until 1974. Since then, Camp Fogarty has been primarily used by the Rhode Island National Guard (RING). The property was transferred to the Department of the Army in December 1993, and has been assigned to RING. Since the property transfer, RING has added several new firing ranges. Camp Fogarty is currently utilized by several military installations, including the Navy, Army, state and federal agencies, area police departments, and civilian groups. Camp Fogarty includes an active firing range. Site 10, the Camp Fogarty Disposal Area, is located west of the firing range, between the firing range berms and a steeply rising hill. Access to the entire area, including the portion of the area referred to as Site 10, is restricted by fences and facility personnel. Camp Fogarty lies within the Potowomut River Basin. No surface water bodies exist within Camp Fogarty.

Site 10 is characterized by the presence of 3 depressions located between the firing range berms and a steeply rising hill. The vicinity of the site is heavily wooded, interspersed with meadow areas. Runoff is expected to be minimal since the site consists of depression areas and the soils are well drained.

5.2 HISTORY OF CONTAMINATION

Cans of rifle- and weapon-cleaning oils and preservatives, as well as miscellaneous municipal-type garbage, were occasionally disposed of in a shallow, sandy excavation just west of the firing ranges at Camp Fogarty. The disposal volume was estimated at 50,000 ft^3. Waste materials included rusted, empty paint cans, 55-gal drums, and miscellaneous metal parts. Empty cans that had contained weapons cleaning fluids were previously removed from and disposed of offsite.

In late 1996, a Removal Action, which involved the removal and offsite disposal of the remaining debris at Site 10, was completed. The Removal Action was performed in order to comply with Rhode Island State Solid Waste Regulations. No confirmation samples were taken, since the cleanup goal was “no visible debris.”

5.3 SUMMARY OF RISK ASSESSMENT

In 1993 and 1998, exposure pathways for residents were evaluated. The estimated cancer risks for adult residents were estimated to be in the acceptable risk range. The greatest portion of risk was attributed to arsenic, beryllium, benzo(a)pyrene, and dibenzo(a,h)anthracene.

The ERA concluded in 1996 that Site 10 does not pose an ecological risk to aquatic or terrestrial populations in the Hunt River watershed.

RIDEM Remediation Regulation Method 1 criteria was met.

5.4 REMEDY SELECTED

An NFA ROD was signed in June 1998 based on residential risk-based analysis and the results of a solid waste removal. This remedy is protective of human health and the environment. As stated in the ROD, a 5-year site review will not be conducted because the site is suitable for unrestricted use.

RIDEM concurred with the NFA decision for this site.

6. SITE 11 FORMER FIRE FIGHTING TRAINING AREA

6.1 SITE LOCATION AND DESCRIPTION

Site 11, the Former Fire Fighting Training Area, consists of an open, grassy field in the Warehouse Triangle surrounded by roadways, measuring approximately 200 ft x 300 ft, and is located approximately 1 mile west of Narragansett Bay. The ground surface slopes gradually to the southwest, and small, shallow, eroded drainage swales are evident in the central portion of the study area. The swales drain to a catch basin on the western side of the study area, which is part of a storm drain system which runs under the site. The storm drainage system discharges into a tributary of Mill Creek, approximately 2,200 ft south-southwest of the site. The ground water flows from Site 11 to Mill Creek, located approximately 0.5 miles from the site to the southwest. The Warehouse Triangle has been sold to the RIEDC for use as part of the Davisville-Quonset Industrial Park. Deed transfer took place in January 2000.

6.2 HISTORY OF CONTAMINATION

Between the mid-1940s and 1955, fire fighting training exercises were held in the field which constitutes Site 11. Waste oils contaminated with solvents and paint thinners were reportedly poured on the ground, ignited, and subsequently extinguished.

Reviews of aerial photos indicate that the Site 11 area was used for vehicle and equipment storage, rather than fire fighting. The bunker in the northeast comer of the area also indicates that if fire fighting was practiced here, it was not a large or continuous operation. In addition, two former Navy fire fighting training areas are being investigated under the formerly used defense sites program (FUDS). These two sites were very actively used. One is located in Little Allen Harbor and the other at the end of the Quonset Point runway.

6.3 SUMMARY OF RISK ASSESSMENT

The results of the HHRA present and future use using a residential exposure scenario determined a cancer risk of less than 1×10^{-4} and an HI of less than 1. These low risks were mostly caused by exposures to arsenic, beryllium, and carcinogenic PAH in the soils, and 1,1,l,-trichloroethane, vinyl chloride, and antimony in ground water found during the 1985, 1986, and 1993 RIs.

The results of the ERA concluded that Site 11 does not pose a risk to the aquatic or terrestrial communities in the Mill Creek watershed, where Site 11 is located.

RIDEM Remediation Regulation Method 1 criteria was met.

6.4 REMEDY SELECTED

An NFA ROD was signed in September 1998 based on residential risk-based analysis. This remedy is protective of human health and the environment. As stated in the ROD, a five-year site review will not be conducted because the site is suitable for unrestricted use.

RIDEM concurred with the NFA decision for this site.

7. SITE 12 BUILDING 316, DPDO TRANSFORMER OIL SPILL AREA

7.1 SITE LOCATION AND DESCRIPTION

Site 12, located within Building 316, contained the DPDO and was used to store electrical transformer units. Site 12 is located in a region known as West Davisville, west of the NCBC Davisville Main Center. Site 12 is bordered to the west by Conrail tracks, to the east by Mike Road, and to the south by a gravel road adjacent to a section of Sandhill Brook known as Black Swamp. West Davisville has been sold to the RIEDC. Deed transfer took place in April 1999.

7.2 HISTORY OF CONTAMINATION

In 1977, a transformer containing PCB oil was accidentally punctured with a forklift in Building 316. The spill area on the concrete floor was contained and cordoned off, and the spill was cleaned up by NCBC Davisville personnel. In October 1984, analysis of a composite concrete sample indicated the presence of PCB contamination (Aroclor 1260 at 91 ppm). In March 1986, 15 wipe samples were collected from the spill area as part of the Confirmation Study (CS). The laboratory analysis detected concentrations of PCB (Aroclor 1254) in the wipe samples ranging from 0.4 to 3.0 micrograms per square inch ($\mu g/in.^2$).

A Removal Action was conducted at Site 12 in early 1991 which involved the removal and disposal of PCB-contaminated concrete and subgrade soils from the floor in Building 316. The removal area consisted of concrete pavement approximately 20 ft x 20 ft in area and a contiguous area approximately 4 ft x 5 ft in size. The pavement, consisting of a 6-inch concrete slab, and 6 in. of subgrade were removed.

The April 1991 post-removal sampling included the collection of concrete chip samples, wipe samples, soil samples, and associated quality control (QC) samples. Four concrete chip samples and 2 wipe samples were collected around the perimeter of the removal area, and 4 soil samples were collected within the removal area. Analysis of the chip, wipe, and soil samples indicated residual PCB contamination was present in the flooring surrounding the removal area and in the subgrade soils above the cleanup levels.

In September 1991, the U.S. Environmental Protection Agency (EPA) conducted additional sampling at Building 316 to further define the horizontal extent of PCB-contaminated flooring. Chip samples were collected from the area surrounding the removal area, with the objective being to collect samples at locations successively further from the removal area perimeter in each direction until 2 consecutive chip sample results contained less than 1 microgram per gram ($\mu g/g$) (ppm) PCB. PCB levels as great as 1,200 $\mu g/g$ were measured in chip samples collected from the remaining concrete materials. In general, the majority of the remaining contamination was detected in samples collected south of the removal area.

7.3 SUMMARY OF RISK ASSESSMENT

PCB represented the sole contaminant of concern (COC) at Site 12. The location of PCB contamination resided within the footprint of the warehouse-type structure of Building 316. The building is currently in use as a commercial building. For the single COC, potential future occupational exposure pathway, and an exposure concentration of 82 µg/l00 cm^2 (the maximum detected PCB concentration in a wipe sample), the estimated reasonable maximum exposure risk is 4 in 100,000 (i.e., 4 x $l0^{-5}$). This was determined in 1991, before the remedial action was completed.

After the remedial action, the Navy again evaluated the potential risk to human health. The results of the HHRA present and future use using a residential exposure scenario determined a cancer risk of less than 1 x 10^{-4} and an HI greater than 1, but less than 10.

The results of the 1991 ERA concluded that Site 12 does not pose a risk to the aquatic or terrestrial communities in the Sandhill Creek watershed, where Site 12 is located.

7.4 REMEDY SELECTED

In September 1993, a ROD was signed for the removal of PCB-contaminated flooring materials and subgrade soils with offsite disposal or offsite incineration. Because the cleanup goals were based on industrial use of the sites, institutional controls to ensure the sites were not used in the future for residential use, and 5-year reviews were also included in the remedy. Cleanup levels selected included PCB levels of 10 ppm for soil, debris, and other materials, or 2 µg/l00 cm^2 for solid surfaces, as measured by a standard wipe test.

7.4.1 Remedy Implementation

Excavation began in January 1995. The Navy removed approximately 225 tons of soil and concrete flooring materials at a cost of $525,000. The remedial action was completed in March 1997. The highest confirmation soil sample was 9.3 ppm. The confirmation concrete samples were not detected above the 0.03 ppm detection limit. All non-porous solid surfaces wipe sampling results were below the 2 µg/l00 cm^2 clean-up level. The soil and concrete areas subject to the remedy were covered over with new concrete floors. Utilizing the post-removal data, the Navy conducted an HHRA. The HHRA indicated that exposure to residual PCB in soils were not above and the non-cancer risks were slightly above 1.

RIDEM Remediation Regulation Method 1 criteria was met.

7.5 FIVE-YEAR REVIEW FINDINGS

An NFA Explanation of Significant Difference (ESD) was signed in September 1998 based on residential risk-based analysis. The requirement for institutional controls and five-year reviews were removed from the remedy. This remedy is protective of human health and the environment. As stated in the ESD, a five-year site review will not be conducted because the site is suitable for unrestricted use.

RIDEM concurred with the NFA for this site.

8. SITE 13 DISPOSAL AREA NORTHWEST OF BUILDINGS W-3, W-4, AND T-1

8.1 SITE LOCATION AND DESCRIPTION

Site 13 is approximately 6 acres in size, is located in the Warehouse Triangle, and consists of a flat, grassy field bounded on three sides by paved roads. Site 13 is northwest of Buildings W-3, W-4, and (the former) T-1, and is bounded on the south by "A" Street, on the east by Exeter Street, and on the north by Foster Street. There are three catch basins in the area. Surface water runoff is collected by storm drains that drain east into Hall Creek. Ground water under most of the site drains northeastward toward Davol Pond and Hall Creek. Due to a ground-water divide under the site, portions of the southwestern site may drain to the west into Mill Creek. The Warehouse Triangle has been sold to the RIEDC for use as part of the Davisville-Quonset Industrial Park. Deed transfer took place in January 2000.

8.2 HISTORY OF CONTAMINATION

Overhaul and repair activities were conducted in the buildings surrounding the site. Vehicles were stored in the fields to the north and west, and drums of oils, thinner, and solvents were stored adjacent to the buildings. Approximately 300 gal per month of waste oils, waste paint thinners, and waste solvents were spread on the ground in empty fields northeast of these buildings by puncturing drums and driving them around the field to drain for dust suppression.

From July 1996 to February 1997, the Navy conducted a removal action to remove PCB-contaminated soils to a cleanup level of 10 ppm. Seven hundred forty-four tons of soils contaminated with less than 50 ppm PCB and 1,490 tons of soils contaminated with more than 50 ppm soils were removed. In addition, 2.2 tons of catch basin sediments and 815 gal of catch basin liquids were removed prior to catch basin cleaning. During the cleaning, 20,170 gal of storm drain cleaning water were also removed for offsite disposal. The removal action occurred over an 8-month period at a total cost of $838,000.

8.3 SUMMARY OF RISK ASSESSMENT

The results of the HHRA present and future use using a residential exposure scenario determined a cancer risk of less than 1×10^{-4} and an HI of less than 1. These low risks were mostly caused by exposures to lead, beryllium, chromium, PCB, and PAH found during the 1985, 1986, and 1993 RIs and during the removal action confirmation sampling.

The results of the ERA concluded that Site 13 does not pose a risk to the aquatic or terrestrial communities in the Hall Creek watershed, where Site 13 is located. The removal of contaminated soils and sediments from the catch basin network at the site should reduce the source of contamination to Hall Creek.

RIDEM Remediation Regulation Method 1 criteria was met.

8.4 REMEDY SELECTED

An NFA ROD was signed in September 1998 based on residential risk-based analysis. This remedy is protective of human health and the environment. As stated in the ROD, a five-year site review will not be conducted because the site is suitable for unrestricted use.

RIDEM concurred with the NFA decision for this site.

9. SITE 14 BUILDING 38, TRANSFORMER OIL LEAK

9.1 SITE LOCATION AND DESCRIPTION

Site 14 is located within Building 38. Prominent features near Site 14 include railroad tracks and Davisville Road to the north, and Davol Pond to the east. Building 38 was constructed in 1942 in the northeast comer of the Warehouse Area of the NCBC. It was used as a bulk storage warehouse for advanced Base construction materials. After the closure of NAS Quonset Point in 1973, it became part of the facilities used by the Public Works Department. Electrical transformers were stored in a section of the Building 38 south bay. The Warehouse Area has been sold to the RIEDC. Deed transfer took place in January 2000.

9.2 HISTORY OF CONTAMINATION

In 1981, oil spillage was noted in Warehouse Building 38 where electrical transformers were stored. The events surrounding the spill are unknown. The spill on the asphalt floor of the building is believed to have been cleaned up by NCBC Davisville personnel as directed by the Northern Division Naval Facilities Engineering Command. In October 1984, NCBC personnel collected a composite asphalt sample from the oil spill area in the building for PCB analysis. The sample analysis results indicated the presence of PCB contamination in the asphalt spill area (Aroclor 1260 at 6,690 ppm). In March 1986, wipe analysis results indicated the presence of PCB (Aroclor 1260) at concentrations ranging from 0.7 to 17,000 $\mu g/in^2$.

In early 1991, PCB-contaminated asphalt materials and subgrade soils were removed from the floor of Building 38. The removal area consisted of asphalt pavement approximately 40 ft x 17 ft in area, and a contiguous area approximately 5 ft x 5 ft in area. The pavement, consisting of 3 in. of asphalt, and 6 in. of subgrade soils, was removed.

Post-removal verification sampling was also conducted at Site 14 in April 1991, following initial removal actions, to confirm and document the removal of PCB-contaminated materials. Analysis of the chip, wipe, and soil samples indicated residual PCB contamination was present in the flooring surrounding the removal area and in the subgrade soils above cleanup levels.

In September 1991, the EPA conducted additional sampling at Building 38 to further define the horizontal extent of PCB-contaminated flooring. Initially, asphalt surface wipe samples were collected at 5-ft intervals around the perimeter of the removal area, with additional wipe samples to be collected further from the removal area in each direction until the wipe sample results were less then 10 $\mu g/l00\ cm^2$. Where wipe samples were less than 10 $\mu g/l00\ cm^2$, a surface chip sample would be collected. Chip samples were then collected at locations successively further from the removal area perimeter in each direction until two consecutive chip sample results contained less than 1 µg/g (ppm) PCBs. When preliminary screening results from the chip samples indicated that there was poor correlation between the wipe sample results and the chip sample results, the wipe sampling was discontinued. PCB levels as great as 82 $\mu g/100\ cm^2$ were

measured in wipe samples, while the maximum concentration detected in asphalt chip samples was 150 µg/g.

9.3 SUMMARY OF RISK ASSESSMENT

PCB represented the sole contaminant of concern at Site 14. The location of PCB contamination resided within the footprint of the warehouse-type structure of Building 38. The building was demolished in 2001. For the single COC, potential future occupational exposure pathway, and an exposure concentration of 82 µg/l00 cm^2 (the maximum detected PCB concentration in a wipe sample), the estimated reasonable maximum exposure risk is 4 in 100,000 (i.e., 4×10^{-5} This was determined in 1991, before the remedial action was started.

After the remedial action, the Navy again evaluated the potential risk to human health. The results of the HHRA present and future use using a residential exposure scenario determined a cancer risk of less than $1 \times l0^{-4}$ and an HI greater than 1, but less than 10.

The results of the 1991 ERA concluded that Site 14 does not pose a risk to the aquatic or terrestrial communities in the Hall Creek watershed, where Site 14 is located.

RIDEM Remediation Regulation Method 1 criteria was met.

9.4 REMEDY SELECTED

In September 1993, a ROD was signed for the removal of PCB-contaminated flooring materials and subgrade soils with offsite disposal or offsite incineration. Because the cleanup goals were based on industrial use of the sites, institutional controls to ensure the sites were not used in the future for residential use, and 5-year reviews were also included in the remedy. Cleanup levels selected included 10 ppm PCB for soil, debris, and other materials, or 2 µg/100 cm^2 for solid surfaces, as measured by a standard wipe test.

9.5 REMEDY IMPLEMENTATION

Excavation began in January 1995. The Navy removed approximately 300 tons of soil and asphaltic flooring materials at a cost of $250,000. The remedial action was completed in March 1997. Utilizing the post-removal data, the Navy conducted an HHRA. The HHRA indicated that exposure to residual PCB in soils is not above 10^{-4} and the non-cancer risks were slightly above 1.

9.6 FIVE-YEAR REVIEW FINDINGS

An NFA ESD was signed in September 1998 based on residential risk-based analysis. The requirement for institutional controls and five-year reviews were removed from the remedy. This remedy is protective of human health and the environment. As stated in the ESD, a five-year site

review will not be conducted because the site is suitable for unrestricted use. The building was demolished in 2001; new buildings are planned for the site.

RIDEM concurred with the NFA decision for this site.

10. STUDY AREA 15, BUILDING 56

10.1 SITE LOCATION AND DESCRIPTION

Building 56 was identified as a Study Area for investigation as part of the 1992 Federal Facilities Interagency Agreement (FFIA). A Study Area Screening Evaluation (SASE) was completed in September 1994. Building 56 was a 1-story concrete building containing a concrete floor with one floor drain. It was located in the northwestern portion of the Administrative Support Area of NCBC Davisville. The Administrative Support Area parcel is 125.89 acres. This parcel was sold to the RIEDC in September 1998. Building 56 was constructed in 1944 and was used to "refine oil." In the early 1950s, the building was converted to paint storage, mixing, and spraying. Between 1960 and September 1984, Building 56 was used as a Pest Control Shop, where pesticides were stored and mixed prior to use onsite. In 1985, the building became a "less than 90-day hazardous waste storage area." The building was used as the central accumulation point for the Base until September 1997. There were no documented releases of hazardous substances or petroleum products at Building 56. The area is currently buried under the new Route 4 highway access ramp.

10.2 HISTORY OF CONTAMINATION

During the SASE, various organic and inorganic constituents were detected in surface soil samples, subsurface soil samples, wipe samples from stained areas inside and outside of the building, and a sample of sediment from a drain connection leading from the building's former wash rack to a wastewater treatment facility. However, concentrations of these constituents were generally below screening criteria appropriate for the intended industrial/commercial re-use of the area. Several metals, including lead and beryllium, were detected in surface soil at levels that exceed Rhode Island Environmental Management (RIDEM) Residential Direct Exposure criteria. However, the detection of lead was from a location from which soil from removed during the removal of lead-contaminated soil (1997). The level of beryllium barely exceeded the residential criterion, and was within NCBC Davisville background levels. Building 56 was then demolished in late September 1997. An abandoned septic tank located near Building 56 and associated soils were removed in October 1997. A man-hole sump located on a concrete pad in front of the building was drained, cleaned, and plugged in December 1997. No ground-water investigation was performed at this site. The November 1996 Basewide ground-water investigation found no indication of contaminated ground water in this parcel.

10.3 SUMMARY OF RISK ASSESSMENT

No contamination existed after the above work was performed; therefore, no HHRA was performed. The results of the 1995 ERA concluded that Study Area 15 does not pose a risk to the aquatic or terrestrial communities in the Mill Creek watershed, where Study Area 15 is located.

10.4 REMEDY SELECTED

An NFA Decision Document was signed in May 1998 based on the demolition of the building and successful soil removals. This remedy is protective of human health and the environment. A five-year site review will not be conducted because the site is suitable for unrestricted use.

RIDEM concurred with the NFA decision for this site.

APPENDIX B

SUPPORT DOCUMENTATION FOR SITE 07

TABLE D-1 LOCATION-SPECIFIC ARARs FOR SITE 07

Media	Requirement	Status	Synopsis	Action to be Taken to Meet ARAR	Most Recent Effective Date*	Modifications/ Impact to Remedy
Wetlands/ Water Resources (Federal)	Executive Order 11990; Wetlands Protection (40 CFR Part 6, Appendix A)	Applicable	Requires action to avoid whenever possible the long- and short-term impacts associated with the destruction of wetlands whenever there is a practicable alternative which promotes the preservation and restoration of the natural and beneficial values of wetlands.	The potential impacts to wetlands from remedial actions at Site 07 will be avoided, to the extent possible, and minimized in accordance with these requirements.	25-Jun-85 (original)	None
	Executive Order 11988; Statement on Proceedings of Floodplain Management (40 CFR 6, Appendix A)	Applicable	Requires action to avoid whenever possible the long- and short-term impacts associated with the occupancy and modifications of floodplains whenever there is a practicable alternative which promotes the preservation and restoration of the natural and beneficial values of floodplains.	The potential impacts to floodplains from remedial actions at Site 07 will be avoided, to the extent possible, and minimized in accordance with these requirements.	24-May-77 (original)	None
	Fish and Wildlife Coordination Act of 1958 (16 U.S.C. 661) Protection of Wildlife Habitats	Applicable	Requires consultation with federal and state conservation agencies during planning and decision-making processes which may impact water bodies, including wetlands.	If the implementation of remedial actions at Site 07 results in an impact to fish and/or wildlife, consultation with the U.S. Fish and Wildlife Service, RIDEM, and other federal and state agencies involved in fish and wildlife matters will be included.	12-Aug-58 (original) 50 CFR 402	None No applicable changes found.

* Compared to that at time ROD signed and remedy implemented.

Media	Requirement	Status	Synopsis	Action to be Taken to Meet ARAR	Most Recent Effective Date*	Modifications/ Impact to Remedy
	Clean Water Act, Section 404, 33 USC 1344; 40 CFR part 230	Applicable	Prohibits the discharge of dredged or fill materials into a water of the U.S. if there is a practicable alternative.	Applicable if the remedy will result in impacts to wetlands. Requirements to minimize and mitigate impacts will be met.	9-May-02 (67 FR 31129) 17-Jan-01 (66 FR 4549) 10-May-99 (64 FR 25120) 16-Aug-00 (65 FR 50108)	- Discharging of dredged material is likely to be regulable, and require complying with permitting requirements. - Clarification of definitions of "fill material", "dredged material," and "discharge." - Discharge of dredged and fill material into and degradation of wetlands strongly discouraged.
	Rivers and Harbors Act, 33 USC 403; 33 CFR Parts 320-323	Relevant and Appropriate	Prohibits unauthorized obstruction or alteration of navigable waters.	The environmental standards in the Act will apply to any actions in tidal waters.	24-Oct-02 (67 FR 65313, 33 CFR 334)	- No dredging or removal activity is anticipated, so no impact to remedy.

Media	Requirement	Status	Synopsis	Action to be Taken to Meet ARAR	Most Recent Effective Date*	Modifications/ Impact to Remedy
Wetlands (State)	Rhode Island Freshwater Wetlands Laws (RIGL 2-1-18 et seq.): RIDEM Rules Governing the Enforcement of the Freshwater Wetlands Act (CRIR 12-100-003)	Applicable	Defines and establishes provision for the protection of swamps, marches, and other freshwater wetlands of the state. Actions are required to prevent the undesirable drainage, excavation, filling, alteration, encroachment, or any other form of disturbance to or destruction of a wetland.	Applicable if the remedy will result in impacts to freshwater wetlands. The potential impacts to wetlands from remedial actions at Site 07 will be avoided, to the extent possible, and minimized in accordance with these requirements.	1-April-98 with 8-Aug-01 amendments	- Wetlands in vicinity of coast now under jurisdiction of RI Coastal Resources Management Council - "Water quality improvement project" defined. - Includes freshwater wetlands in vicinity of the coast. - No impact expected to remedy.

Media	Requirement	Status	Synopsis	Action to be Taken to Meet ARAR	Most Recent Effective Date*	Modifications/ Impact to Remedy
Endangered Species (Federal)	Endangered Species Act of 1973 (16 U.S.C. 1531): Protection of Endangered Species	Applicable	Remedial actions may not jeopardize the continued existence of federally-listed endangered or threatened species, or adversely modify or destroy their critical habitats.	The federally endangered loggerhead turtle (*Caretta caretta*) and federally threatened Kemp's ridley turtle (*Lepidochelys kempii*) occur in the waters of Narragansett Bay. This standard is applicable if these species are identified at or adjacent to Site 07. Appropriate agencies will be contacted and measures will be taken during remedial activities to ensure that the species and its habitat are not adversely affected.	7-Dec-99 (64 FR 68507) 50 CFR 17 50 CFR 10.13	- No other applicable - change found. - No removal activity is anticipated so no impact expected to the remedy.
Endangered Species (State)	Rhode Island Endangered Species Act (RIGL 20-37-1 et seq.)	Applicable	Remedial actions may not jeopardize the continued existence of state-listed endangered or threatened species, or adversely modify or destroy their critical habitats.	Information provided by RIDEM indicates that the Least Tern has been identified in the Davisville/Quonset area. The federally endangered loggerhead turtle (*Caretta caretta*) and federally threatened Kemp's ridley turtle (*Lepidochelys kempii*) occur in the waters of Narragansett Bay. If any of these species are identified at Site 07, then appropriate measures will be taken during construction activities to ensure that the remedial action does not adversely affect the species or its habitat.	Original guidance	- No removal activity is anticipated so no impact expected to the remedy.

Media	Requirement	Status	Synopsis	Action to be Taken to Meet ARAR	Most Recent Effective Date*	Modifications/ Impact to Remedy
Coastal Zones (Federal)	Coastal Zone Management Act (16 USC 3501 et seq.)	Applicable	Must conduct activities in a manner consistent with the approved state management program.	The substantive requirements of this Act will be met.	8-Dec-00 (65 FR 77123), 15 CFR 930	No applicable changes found.
Coastal Zones (State)	Rhode Island Coastal Resources Management Law (RIGL 46-23) and Regulations (CRIR 04-000-010)	Applicable	Creates the Coastal Resources Management Council and sets standards and authorizes promulgation of regulations for management and protection of coastal resources. Requires demonstration that development or operation in coastal areas is consistent with the Coastal Resources Management Plan without significantly damaging the environment of the coastal region.	Because Site 07 is located in a coastal area, the Navy will coordinate with the CRMC, as appropriate, to ensure that any remedial actions which will affect the coastline of Calf Pasture Point are consistent with the Coastal Resources Management Plan to the maximum extent possible.	2-Jan-02	No applicable changes found.
Historic Places (Federal)	Preservation of Historical and Archeological Data Act of 1974 (16 USC 469 et seq., 36 CFR Part 800)	Applicable	Requires recovering and preserving significant historical or archeological data when such data are threatened by a federal action of federally licensed action which alters any terrain where such data are located.	Portions of Site 07 have been identified as potential archaeologically-significant areas. Located objects will be recovered and preserved in accordance with the substantive requirements.	18-May-99	No applicable changes found.
Historic Places (State)	Rhode Island Historic Preservation Act (RIGL 42-45 et seq.)	Applicable	This act requires the recovering and preservation of archeological and historic data and artifacts when threatened by a publicly funded action.	Since there are potential archeological sensitive areas at the site, the Navy will need to coordinate with RIHPC.	9-Jan-02	No applicable changes found.

TABLE D-2 ACTION-SPECIFIC ARARs AND TBCS FOR SITE 07

Process	Requirement	Status	Synopsis	Action to be Taken to Meet ARAR	Most Recent Effective Date*	Modifications/ Impact to Remedy
Sediment Monitoring (Federal)	Clean Water Act (33 USC 1251-1376; federal Ambient Water Quality Criteria, 40 CFR 122.44	Relevant and Appropriate	Guidelines established for the protection of human health and/or aquatic organisms.	Shoreline/offshore sediment is within the discharge area for Site 07 ground water. Therefore, if determined to be necessary during the long-term ground-water monitoring program, AWQC, with modification, will be used to develop performance standards for sediment.	4-Aug-99 (64 CFR 149)	- Criteria for arsenic - revised. - No other applicable - changes found. - Arsenic revision will be incorporated in the LTMP.
Sediment Monitoring (State)	Water Pollution Control (RIGL 46-12 et seq.) and Water Quality Standards and Ambient Water Quality Guidelines	Relevant and Appropriate	Establishes water use classifications and water quality criteria for all waters of the state. Establishes acute and chronic ambient water quality criteria for the protection of aquatic life.	Shoreline/offshore sediment is within the discharge area for Site 07 ground water. Therefore, if determined to be necessary during the long-term ground-water monitoring program, Rhode Island ambient water quality guidelines will be considered for the development of performance standards for sediment.	23-Jun-00 (EVM 112-88.97-1) 8-Nov-00 (64 FR 61181)	- Water quality criteria - amended. - No applicable changes found.

* Compared to that at time ROD signed and remedy implemented.

Process	Requirement	Status	Synopsis	Action to be Taken to Meet ARAR	Most Recent Effective Date*	Modifications/ Impact to Remedy
Ground-Water Monitoring (Federal)	Resource Conservation and Recovery Act (RCRA), 42 USC 6901 et seq.	Relevant and Appropriate	Outlines specifications for the performance of hazardous waste storage, treatment, and disposal facilities.	Substantive RCRA requirements are to be met pertaining to wastes disposed of prior to 1980 and to RCRA-lasted or characteristic waste generated during proposed monitoring activities.	22-Oct-98 (63 FR 56733)	- No applicable changes found.
	RCRA – Generator and Handler Requirements 40 CFR 260-261	Relevant and Appropriate	Establishes standards for listing and identification of hazardous waste.	For any materials generated during monitoring well installation, hazardous waste determinations will be performed and the wastes will be managed in accordance with these regulations, if necessary.	6-Aug-98 and 8-Nov-00 (63 FR 42109)	- No applicable changes found.
	RCRA - Subpart F, 40 CFR 264.90 (Applicability) and Subpart G, 40 CFR 264.110 through 264.120 (Closure and Post Closure)	Relevant and Appropriate	Post-closure requirements for units where hazardous waste was disposed prior to 1982.	Monitoring standards will be met through the implementation of the long-term ground-water monitoring program.	30-Nov-98 (63 FR 65938) 22-Oct-98 (63 FR 56733) 18-Aug-92 (57 FR 37265)	- No applicable changes found.

Process	Requirement	Status	Synopsis	Action to be Taken to Meet ARAR	Most Recent Effective Date*	Modifications/ Impact to Remedy
	Clean Water Act (33 USC 1251-1376); Federal Ambient Water Quality Criteria (AWQC), 40 CFR 122.44	Relevant and Appropriate	Standards established for the protection of human health and/or aquatic organisms.	AWQC, with modification, will be used during the development of performance standards for ground water based on the potential for discharge to surface water which may be used for fishing, boating, shellfish harvesting, and for wildlife habitat.	13-Jul-00 (65 FR 135)	- Total Maximum Daily Loads (TDML) have been revised. - Currently, ground water is compared to MCL and piezometer water is compared to AWQC. However, piezometer water samples are only analyzed for targeted VOC for which there are no AWQC. Therefore, there is no anticipated impact to the remedy.
	Safe Drinking Water Act, 40 CFR Part 141	Relevant and Appropriate	Establishes enforceable Maximum Contaminant Levels (MCL) as standards for public drinking water systems. Used as cleanup standards for aquifers that are potential drinking water supplies. Establishes Maximum Contaminant Level Goals (MCLG) which are non-enforceable health goals for public drinking water systems. Non-zero MCLG are relevant and appropriate.	MCL and non-zero MCLG will be used during the development of performance standards for ground-water.	22-Jan-01 (66 FR 7061)	- MCL for arsenic revised. - No other applicable changes found. - The arsenic revision will be incorporated in the LTMP.

Process	Requirement	Status	Synopsis	Action to be Taken to Meet ARAR	Most Recent Effective Date*	Modifications/ Impact to Remedy
Ground-Water Monitoring (State)	Rules and Regulations for Ground-Water Quality (12-100-006)	Applicable	Rules and Regulations intended to protect and restore the quality of the state's ground water. Includes ground-water monitoring program requirements and monitoring well construction abandonment. Also establishes ground-water quality standards and/or requirements.	Ground-water monitoring program will comply with these regulations. Water quality standards will be used during the development of performance standards for ground-water.	Aug-96	- None
	Rhode Island Hazardous Waste Management Act of 1978 (RIGL 23-19.1 et seq.)	Relevant and Appropriate	Rules and regulations for hazardous waste generation, transportation, treatment, storage, and disposal. They incorporate, by reference, the federal RCRA requirements.	Wastes generated during monitoring activities will be managed in accordance with these regulations.	12-Dec-02 (DEM OWM - HW12-02, DEM OWM - SW2)	- No applicable changes found.

Process	Requirement	Status	Synopsis	Action to be Taken to Meet ARAR	Most Recent Effective Date*	Modifications/ Impact to Remedy
	Water Pollution Control (RIGL 46-12 et seq) and Water Quality Standards and Ambient Water Quality Guidelines	Relevant and Appropriate	Establishes water use classifications and water quality criteria for all waters of the state. Establishes acute and chronic ambient water quality criteria for the protection of aquatic life.	Discharges of ground water from Site 07 to surface water will comply with the substantive portions of these regulations to the extent that they are more stringent than federal standards.	12-Jun-01 (DEM 2000 303(d) List) 23-Jun-00 (EVM 112-88.97-1)	- Various classifications and criteria have been - revised. - Allen's Harbor (and possible other local waterbodies) listed as Impaired Waterbody, Group 5 for total toxics. - Results of ground-water samples are compared to calculated trigger values (not AWQC) established for the LTMP. Therefore, no related impact to the site remedy is anticipated. No RIDEM GA goals have changed that are more stringent than the Federal MCL for the targeted VOC and metals in the site LTMP.

Process	Requirement	Status	Synopsis	Action to be Taken to Meet ARAR	Most Recent Effective Date*	Modifications/ Impact to Remedy
	Rules and Regulations for the Investigation and Remediation of Hazardous Material Releases (CRIR 12-180-001)	Relevant and Appropriate	These regulations set remediation standards for contaminated media at non-NPL sites in RI. These standards may also be determined to be relevant and appropriate for NPL sites if they are more stringent than federal standards.	For GA ground water at this site, the only standards within these regulations that is more stringent than applicable federal standards is for nickel. The nickel standard within these regulations will be used during the development of performance standards for ground-water monitoring.	Aug-96 (DEM DSR-01-93)	- None.

TABLE H-3 SUMMARY OF SURFACE WATER EPCS FOR SITE 07 – CALF PASTURE POINT, NCBC DAVISVILLE

COC	Risk-Based Trigger Value (mg/L)
Inorganics	
Aluminum	4.46E+01
Antimony	1.68E-01
Arsenic	2.04E-02
Beryllium	8.42E-01
Chromium	4.46E+01
Iron	2.44E+01
Manganese	9.66E+00
Nickel	6.30E+00
Volatiles	
1,1,2-Trichloroethane	6.02E-02
1,1-Dichhloroethene	4.29E-03
1,2-Dichloroethane	8.43E-02
1,1,2,2-Tetrachloroethane	1.39E-02
Benzene	7.74E-02
Chloroform	6.46E-01
Total 1,2-Dichloroethene	9.86E-01
Tetrachloroethene	1.02E-02
Trichloroethene	1.84E-01
Vinyl Chloride	3.78E-03

TABLE H-4.1 VALUES USED FOR ADULT RECREATIONAL USER DAILY SURFACE WATER INTAKE EQUATIONS
SITE 07 – CALF PASTURE POINT, NCBC DAVISVILLE

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water
Exposure Point: Davisville Site 07
Receptor Population: Recreational User
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/Reference
Ingestion	CR	Ingestion Rate = CR	L/hr	0.05	U.S. EPA 1989
	ET	Exposure Time = ET	hr/day	1	BPJ
	EF	Exposure Frequency = EF	day/yr	39	BPJ
	ED	Exposure Duration = ED	yr	30	U.S. EPA 1991
	BW	Body Weight = BW	kg	70	U.S. EPA 1991
	AT-NC	Averaging time-Noncancer	days	10,950	U.S. EPA 1991
	AT-C	Averaging Time – Cancer	days	25,550	U.S. EPA 1989
Dermal	SA	Surface Area for Contact = SA	cm2	18,000	U.S. EPA 2000
	PC	Permeability Coefficient	cm/hr	chemical-specific	U.S. EPA 1992
	ET	Exposure Time = ET	hr/day	1	BPJ
	EF	Exposure Frequency = EF	day/yr	39	BPJ
	ED	Exposure Duration = ED	yr	30	BPJ
	BW	Body Weight = BW	kg	70	U.S. EPA 1991
	AT-NC	Averaging time - Noncancer = AT-NC	days	10,950	U.S. EPA 1991
	AT-C	Averaging Time – Cancer = AT-C	days	25,550	U.S. EPA 1989
	CF	Conversion Factor = CF	L/cm3	1.00E-03	

NOTE: BPJ = Best Professional Judgement

TABLE H-4.2 VALUES USED FOR ADULT RECREATIONAL USER DAILY SURFACE WATER INTAKE EQUATIONS SITE 07 – CALF PASTURE POINT, NCBC DAVISVILLE

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water
Exposure Point: Davisville Site 07
Receptor Population: Recreational User
Receptor Age: Child

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/Reference
Ingestion	CR	Ingestion Rate = CR	L/hr	0.05	U.S. EPA 1989
	ET	Exposure Time = ET	hr/day	1	U.S. EPA 1997
	EF	Exposure Frequency = EF	day/yr	39	BPJ
	ED	Exposure Duration = ED	yr	4	U.S. EPA 1991
	BW	Body Weight = BW	kg	15	U.S. EPA 1991
	AT-NC	Averaging time-Noncancer	days	1,460	U.S. EPA 1991
	AT-C	Averaging Time – Cancer	days	25,550	U.S. EPA 1989
Dermal	SA	Surface Area for Contact = SA	cm2	6,600	U.S. EPA 2000
	PC	Permeability Coefficient	cm/hr	chemical-specific	U.S. EPA 1992
	ET	Exposure Time = ET	hr/day	1	U.S. EPA 1997
	EF	Exposure Frequency = EF	day/yr	39	BPJ
	ED	Exposure Duration = ED	yr	4	U.S. EPA 1991
	BW	Body Weight = BW	kg	15	U.S. EPA 1991
	AT-NC	Averaging time - Noncancer = AT-NC	days	1,460	U.S. EPA 1991
	AT-C	Averaging Time – Cancer = AT-C	days	25,550	U.S. EPA 1989
	CF	Conversion Factor = CF	L/cm3	1.00E-03	

NOTE: BPJ = Best Professional Judgement

TABLE H-5.1 NON-CANCER TOXICITY DATA – ORAL/DERMAL
SITE 07 – CALF PASTURE POINT, NCBC DAVISVILLE

Chemical of Potential Concern	Chronic/ Subchronic	Oral RfD Value (mg/kg-day)	Oral to Dermal Adjustment Factor (GI ABS) (1)	Adjusted Dermal RfD (2) (mg/kg bw-day)	Primary Target Organ	Combined Uncertainty/ Modifying Factors	Sources of RfD: Target Organ	Dates of RfD: Target Organ (3) (mm/dd/yy)
Inorganics								
Aluminum	Subchronic	1.00E+00	1	1.00E+00	Central Nervous System	100/3	EPA-NCEA	5/30/1997
Antimony	Chronic	4.00E-04	0.15	6.00E-05	Blood glucose and cholesterol	100/1	IRIS	1/17/2003
Arsenic	Chronic	3.00E-04	1	3.00E-04	Skin	3/1	IRIS	1/17/2003
Beryllium	Chronic	2.00E-03	0.007	1.40E-05	Small Intestine	300/1	IRIS	1/17/2003
Chromium	Chronic	1.50E+00	0.025	3.75E-02	None	300/3	IRIS	1/17/2003
Iron	NA	3.00E-01	1	3.00E-01	None	NA/NA	EPA-NCEA	
Manganese	Chronic	2.00E-02	0.04	8.00E-04	Central Nervous System	1/1	IRIS	1/17/2003
Nickel	Chronic	2.00E-02	0.04	8.00E-04	None	3000/1	IRIS	1/17/2003
Volatiles								
1,1,2-Trichloroethane	Chronic	4.00E-03	1	4.00E-03	Blood	1000/1	IRIS	1/17/2003
1,1-Dichhloroethene	Chronic	5.00E-02	1	5.00E-02	Liver	100/1	IRIS	1/17/2003
1,2-Dichloroethane	Chronic	3.00E-02	1	3.00E-02	Central Nervous System	1000/1	EPA-NCEA	4/5/2003
1,1,2,2-Tetrachloroethane	Chronic	6.00E-02	1	6.00E-02	None	NA/NA	EPA-NCEA	
Benzene	Chronic	3.00E-03	1	3.00E-03	Central Nervous System	1000/1	EPA-NCEA	9/1/1998
Chloroform	Chronic	1.00E-02	1	1.00E-02	Liver	100/1	IRIS	1/17/2003
Total 1,2-Dichloroethene	Chronic	9.00E-03	1	9.00E-03	Liver	3000/1	HEAST	5/1/1995
Tetrachloroethene	Chronic	1.00E-02	1	1.00E-02	Liver	1000/1	IRIS	1/17/2003
Trichloroethene	Chronic	3.00E-04	1	3.00E-04	Central Nervous System, Liver, Kidney	NA/NA	EPA-NCEA	5/23/2001
Vinyl Chloride	Chronic	3.00E-03	1	3.00E-03	Liver	30/1	IRIS	1/17/2003

NOTES:
NA = Not applicable.
(1) = Taken from USEPA 2000 Guidance. USEPA, 2000. Risk Assessment Guidance for Superfund, volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment). Interim Guidance.
(2) = Dermal toxicological values adjusted from oral values using USEPA 2000 recommended chemical-specific gastrointestinal absorption factors (GI ABS). RfDs are multiplied by the GI ABS.
(3) = IRIS – Integrated Risk Information System. For IRIS values, the date IRIS was searched is provided.
HEAST – Health Effects Assessment Summary Tables. For HEAST values, the date of HEAST is provided.
EPA-NCEA – National Center for Environmental Assessment. For EPA-NCEA values, the date of the article provided by EPA-NCEA is provided.

TABLE H-5.2 CHEMICAL-SPECIFIC PARAMETERS
SITE 07 – CALF PASTURE POINT, NCBC DAVISVILLE

Chemical of Potential Concern	Permeability Constant (cm/hr)	Reference
Inorganics		
Aluminum	1.00E-03	On-line Database(1)
Antimony	1.00E-03	On-line Database(1)
Arsenic	1.00E-03	On-line Database(1)
Beryllium	NA(2)	U.S. EPA, 2000
Chromium	1.00E-03	On-line Database(1)
Iron	1.00E-03	On-line Database(1)
Manganese	1.00E-03	On-line Database(1)
Nickel	1.00E-03	On-line Database(1)
Volatiles		
1,1,2-Trichloroethane	6.43E-03	On-line Database(1)
1,1-Dichhloroethene	1.59E-02	On-line Database(1)
1,2-Dichloroethane	5.30E-03	On-line Database(1)
1,1,2,2-Tetrachloroethane	8.97E-03	On-line Database(1)
Benzene	2.10E-02	On-line Database(1)
Chloroform	8.90E-03	On-line Database(1)
Total 1,2-Dichloroethene	1.10E-03	On-line Database(1)
Tetrachloroethene	4.81E-02	On-line Database(1)
Trichloroethene	1.60E-02	On-line Database(1)
Vinyl Chloride	1.13E-02	On-line Database(1)

NOTES:
(1) = Toxicity and Chemical-Specific Factors Database. Http://risk.lsd.ornl.gov/cgi-bin/tox. January 2003.
(2) = Default Kp value for beryllium is a predicted value, and, therefore, inherently uncertain. Kp value is low, and the uncertainty great.
U.S. EPA, 2000 = U.S. Environmental Protection Agency, 2000. Risk Assessment Guidance for Superfund. Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment). Interim Guidance.

TABLE H-6.1 CANCER TOXICITY DATA – ORAL/DERMAL
SITE 07 – CALF PASTURE POINT, NCBC DAVISVILLE

Chemical of Potential Concern	Oral Cancer Slope Factor	Oral to Dermal Adjustment Factor (GI ABS)(1)	Adjusted Cancer Slope Factor(2)	Units	Weight of Evidence/Cancer Guideline Description	Source	Dates (3) (mm/dd/yy)
Inorganics							
Aluminum	NA	1	NA	per (mg/kg-day)	D	EPA-NCEA	5/30/1997
Antimony	NA	0.15	NA	per (mg/kg-day)	D	IRIS	1/17/2003
Arsenic	1.50E+00	1	1.50E+00	per (mg/kg-day)	A	IRIS	1/17/2003
Beryllium	NA	0.007	NA	per (mg/kg-day)	D	IRIS	1/17/2003
Chromium	NA	0.025	NA	per (mg/kg-day)	D	IRIS	1/17/2003
Iron	NA	1	NA	per (mg/kg-day)	NA	EPA-NCEA	
Manganese	NA	0.04	NA	per (mg/kg-day)	D	IRIS	1/17/2003
Nickel	NA	0.04	NA	per (mg/kg-day)	NA	IRIS	1/17/2003
Volatiles							
1,1,2-Trichloroethane	5.70E-02	1	5.70E-02	per (mg/kg-day)	C	IRIS	1/17/2003
1,1-Dichhloroethene	NA	1	NA	per (mg/kg-day)	C	IRIS	1/17/2003
1,2-Dichloroethane	9.10E-02	1	9.10E-02	per (mg/kg-day)	B2	IRIS	1/17/2003
1,1,2,2-Tetrachloroethane	2.00E-01	1	2.00E-01	per (mg/kg-day)	C	IRIS	1/17/2003
Benzene	5.50E-02	1	5.50E-02	per (mg/kg-day)	A	IRIS	1/17/2003
Chloroform	NA	1	NA	per (mg/kg-day)	B2	IRIS	1/17/2003
Total 1,2-Dichloroethene	NA	1	NA	per (mg/kg-day)	D	IRIS	1/17/2003
Tetrachloroethene	5.20E-02	1	5.20E-02	per (mg/kg-day)	B2	EPA-NCEA	
Trichloroethene	4.00E-01	1	4.00E-01	per (mg/kg-day)	NA	EPA-NCEA	5/23/2001
Vinyl Chloride	1.40E+00	1	1.40E+00	per (mg/kg-day)	A	IRIS	1/17/2003
Vinyl Chloride - Adult	7.20E-01	1	7.20E-01	per (mg/kg-day)	A	IRIS	1/17/2003

NOTES:
NA = Not applicable.
(1) = Taken from USEPA 2000 Guidance. USEPA, 2000. Risk Assessment Guidance for Superfund, volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment). Interim Guidance.
(2) = Dermal toxicological values adjusted from oral values using USEPA 2000 recommended chemical-specific gastrointestinal absorption factors (GI ABS). RfDs are multiplied by the GI ABS.
(3) = IRIS – Integrated Risk Information System. For IRIS values, the date IRIS was searched is provided. HEAST – Health Effects Assessment Summary Tables. For HEAST values, the date of HEAST is provided. EPA-NCEA – National Center for Environmental Assessment. For EPA-NCEA values, the date of the article provided by EPA-NCEA is provided.

Weight of Evidence:
A = Human carcinogen.
B1 = Probale human carcinogen – indicates that limited human data are available.
B2 = Probale human carcigogen – indicates sufficient evidence in animals and inadequate or no evidence in humans.
C = Possible human carcingeon.
D = Nor classifiable as a human carcinogen.
E = Evidence of non-carcinogenicity.

TABLE H-9.1 SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs REASONABLE MAXIMUM EXPOSURE SITE 07 – CALF PASTURE POTNT, NCBC DAVISVILLE

Location: Site 07

Scenario Timeframe: Future
Receptor Population: Recreational User
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical*	Carcinogenic Risk	Chemical		Chemical*	Non-Carcinogenic Hazard Quotient			
				Ingestion	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Dermal	Exposure Routes Total
Surface Water	Surface Water	Site 07	**Inorganics**				**Inorganics**				
			Aluminum	--	--	NA	Aluminum	Central Nervous System	3.4E-03	1.2E-03	4.6E-03
			Antimony	--	--	NA	Antimony	Blood Glucose and Cholesterol	3.2E-02	7.7E-02	1.1E-02
			Arsenic	1.0E-06	3.6E-07	1.4E-06	Arsenic	Skin	5.2E-03	1.9E-03	7.1E-03
			Beryllium	--	--	NA	Beryllium	Small Intestine	3.2E-02	--	3.2E-02
			Chromium	--	--	NA	Chromium	None	2.3E-03	3.3E-02	3.5E-02
			Iron	--	--	NA	Iron	None	6.2E-03	2.2E-03	8.4E-03
			Manganese	--	--	NA	Manganese	Central Nervous System	3.7E-02	3.3E-01	3.7E-01
			Nickel	--	--	NA	Nickel	None	2.4E-02	2.2E-01	2.4E-01
			Volatiles				**Volatiles**				
			1,1,2-Trichloroethane	1.1E-07	2.6E-07	3.7E-07	1,1,2-Trichloroethane	Blood	1.1E-03	2.7E-03	3.8E-03
			1,1-Dichhloroethene	--	--	NA	1,1-Dichhloroethene	Liver	6.5E-06	3.7E-05	4.4E-05
			1,2-Dichloroethane	2.5E-07	4.8E-07	7.3E-07	1,2-Dichloroethane	Central Nervous System	2.1E-04	4.1E-04	6.2E-04
			1,1,2,2-Tetrachloroethane	9.1E-08	2.9E-07	3.8E-07	1,1,2,2-Tetrachloroethane	None	1.8E-05	5.7E-05	7.5E-05
			Benzene	1.4E-07	1.1E-06	1.2E-06	Benzene	Central Nervous System	2.0E-03	1.5E-02	1.7E-02
			Chloroform	--	--	NA	Chloroform	Liver	4.9E-03	1.6E-02	2.1E-02
			Total 1,2-Dichloroethene	--	--	NA	Total 1,2-Dichloroethene	Liver	8.4E-03	3.3E-03	1.2E-02
			Tetrachloroethene	1.7E-08	3.0E-07	3.2E-07	Tetrachloroethene	Liver	7.8E-05	1.3E-03	1.4E-03
			Trichloroethene	2.4E-06	1.4E-05	1.6E-05	Trichloroethene	Central Nervous System, Liver, Kidney	4.7E-02	2.7E-01	3.2E-01
			Vinyl Chloride	1.7E-07	7.0E-07	8.8E-07	Vinyl Chloride	Liver	9.6E-05	3.9E-04	4.9E-04
			(Total)	4.2E-06	1.7E-05	2.2E-05	(Total)		2.1E-01	9.7E-01	1.2E+00
					Total Risk Across Surface Water	**2.2E-05**				**Total Hazard Index Across Surface Water**	**1.2E+00**
					Total Risk Across All Media And All Exposure Routes	**2.2E-05**				**Total Hazard Index Across All Media And All Exposure Routes**	**1.2E+00**
										Total HI CNS	**3.9E-01**
										Total HI Blood	**1.1E-01**
										Total HI Intestines	**3.2E-02**
										Total HI Liver	**3.4E-02**

* Chemicals listed are those with trigger concentrations previously listed in Table H-3.

TABLE H-9.2 SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCS REASONABLE MAXIMUM EXPOSURE SITE 07 – CALF PASTURE POINT, NCBC DAVISVILLE

Location: Site 07

Scenario Timeframe: Future
Receptor Population: Recreational User
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical*	Carcinogenic Risk	Chemical		Chemical*	Non-Carcinogenic Hazard Quotient			
				Ingestion	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Dermal	Exposure Routes Total
Surface Water	Surface Water	Site 07	**Inorganics**				**Inorganics**				
			Aluminum	--	--	NA	Aluminum	Central Nervous System	1.6E-02	2.1E-03	1.8E-02
			Antimony	--	--	NA	Antimony	Blood glucose and cholesterol	1.5E-01	1.3E-01	2.8E-01
			Arsenic	6.2E-07	8.2E-08	7.0E-07	Arsenic	Skin	2.4E-02	3.2E-03	2.7E-02
			Beryllium	--	--	NA	Beryllium	Small Intestine	1.5E-01	--	1.5E-01
			Chromium	--	--	NA	Chromium	None	1.1E-02	5.6E-02	6.7E-02
			Iron	--	--	NA	Iron	None	2.9E-02	3.8E-03	3.3E-02
			Manganese	--	--	NA	Manganese	Central Nervous System	1.7E-01	5.7E-01	7.4E-01
			Nickel	--	--	NA	Nickel	None	1.1E-01	3.7E-01	4.8E-01
			Volatiles				**Volatiles**				
			1,1,2-Trichloroethane	7.0E-08	5.9E-08	1.3E-07	1,1,2-Trichloroethane	Blood	5.4E-03	4.5E-03	9.9E-03
			1,1-Dichhloroethene	--	--	NA	1,1-Dichhloroethene	Liver	3.1E-05	6.4E-05	9.5E-05
			1,2-Dichloroethane	1.6E-07	1.1E-07	2.7E-07	1,2-Dichloroethane	Central Nervous System	1.0E-03	7.0E-04	1.7E-03
			1,1,2,2-Tetrachloroethane	5.7E-08	6.7E-08	1.2E-07	1,1,2,2-Tetrachloroethane	None	8.3E-05	9.8E-05	1.8E-04
			Benzene	8.7E-08	2.4E-07	3.3E-07	Benzene	Central Nervous System	9.2E-03	2.5E-02	3.5E-02
			Chloroform	--	--	NA	Chloroform	Liver	2.3E-02	2.7E-02	5.0E-02
			Total 1,2-Dichloroethene	--	--	NA	Total 1,2-Dichloroethene	Liver	3.9E-02	5.7E-03	4.5E-02
			Tetrachloroethene	1.1E-08	6.9E-08	7.9E-08	Tetrachloroethene	Liver	3.6E-04	2.3E-03	2.7E-03
			Trichloroethene	1.5E-06	3.2E-06	4.7E-06	Trichloroethene	Central Nervous System, Liver, Kidney	2.2E-01	4.6E-01	6.8E-01
			Vinyl Chloride	1.1E-07	1.6E-07	2.7E-07	Vinyl Chloride	Liver	4.5E-04	6.7E-04	1.1E-03
			(Total)	2.6E-06	4.0E-06	6.6E-06	(Total)		9.6E-01	1.7E+00	2.6E+00
					Total Risk Across Surface Water	**6.6E-06**				**Total Hazard Index Across Surface Water**	**2.6E+00**
					Total Risk Across All Media And All Exposure Routes	**6.6E-06**				**Total Hazard Index Across All Media And All Exposure Routes**	**2.6E+00**
										Total HI CNS	**7.9E-01**
										Total HI Blood	**2.9E-01**
										Total HI Intestines	**1.5E-01**
										Total HI Liver	**9.9E-02**

* Chemicals listed are those with trigger concentrations previously listed in Table H-3.

APPENDIX C

SUPPORT DOCUMENTATION FOR SITE 09

TABLE D-1 CHEMICAL-SPECIFIC ARARs AND TBCs FOR SITE 09

AUTHORITY/ ACTION	REQUIREMENT	STATUS	SYNOPSIS	ACTION TO BE TAKEN TO MEET ARAR	MOST RECENT EFFECTIVE DATE*	MODIFICATIONS/IMPACT TO REMEDY
Sediment (Federal)	Federal Clean Water Act (CWA) (33 USC 1251-1376); Clean Water Act, Water Quality Criteria, 40 CFR 122.44	Relevant and Appropriate	Non-enforceable guidelines established for the protection of human health and/or aquatic organisms. These guidelines are used by states to set water quality standards for surface water.	AWQC may be considered for the development of sediment cleanup goals.	13-Jul-00 (65 FR 135)	Total Maximum Daily Loads (TDML) have been revised. No current impact to the site remedy.
	EPA Proposed Sediment Quality Criteria (Fed. Reg. Vol. 59, No. 11 18 January 1994)	To Be Considered	Establishes proposed levels of five priority pollutants in fresh and salt waters for the protection of benthic organisms.	To be considered for the development of PRGs.	18-Jan-94 (original guidance)	None.
Sediment (State)	Water Quality Regulations for Water Pollution Control CRIR 12-190-001	Relevant and Appropriate	Establishes water quality criteria and water classifications. Sets remedial objectives for surface water and sediment.	Ground water will be monitored to determine if it is adversely impacting surface water or sediment. Will be used for screening of ground-water COC concentrations.	23-Jun-00 (EVM 112-88.97-1) 8-Nov-00 (64 FR 61181)	Water quality criteria amended June 2000. Incorporated where appropriate in Final LTM QAPP dated November 2001.
All	Risk Assessment Guidance - Cancer Slope Factors (CSF) and Reference Doses (RfD)	To Be Considered	Used in human health risk assessments as guidance values to evaluate the potential carcinogenic or non-carcinogenic hazard caused by exposure to COC.	Affected soil will be capped and sediment will be monitored to minimize exposures to potential receptors.	Integrated Risk Information System (2003)	Refer to Section 2.2.7 of the First Five-Year Review.

*Compared to that at time ROD signed and remedy implemented.

TABLE D-2 LOCATION-SPECIFIC ARARs AND TBCs FOR SITE 09

AUTHORITY/ ACTION	REQUIREMENT	STATUS	SYNOPSIS	ACTION TO BE TAKEN TO MEET ARAR	MOST RECENT EFFECTIVE DATE*	MODIFICATIONS/IMPACT TO REMEDY
Wetlands/ Water Resources (Federal)	Executive Order 11988 and 11990; Statement on Proceedings of Floodplain Management and Wetlands Protection (40 CFR 6, Appendix A)	Applicable	Requires action to avoid whenever possible the long- and short-term impacts associated with the destruction of wetlands and the occupancy and modifications of floodplains and wetlands whenever there is a practicable alternative which promotes the preservation and restoration of the natural and beneficial values of wetlands and floodplains.	The site is on Narragansett Bay and is immediately adjacent to wetlands. Therefore the remedial action will be designed and constructed in a manner which will meet the substantive requirements that would be in a CWA Section 404 permit. The impacts to wetlands and floodplains will be minimized and mitigated including restoration of existing wetlands and construction of new wetlands.	25-Jun-85 (original)	None.
	Clean Water Act Section 404 (40 CFR 230.10) Requirements for Discharge of Dredge or Fill Material	Applicable	Prohibits the discharge of dredged or fill material to a water of the United States if there is a practicable alternative which poses less of an adverse impact on the aquatic ecosystem or if it causes significant degradation of the water or jeopardizes the existence of an endangered or threatened species.	The site is on Narragansett Bay and is immediately adjacent to wetlands. Therefore the remedial action will be designed and constructed in a manner which will meet the substantive requirements that would be in a CWA Section 404 permit. The impacts to wetlands and floodplains will be minimized and mitigated including restoration of existing wetlands and construction of new wetlands.	9-May-02 (67 FR 31129) 17-Jan-01 (66 FR 4549) 10-May-99 (64 FR 25120) 16-Aug-00 (65 FR 50108)	- Discharging of dredged material is likely to be regulable, and require complying with permitting requirements. - Clarification of definitions of "fill material," "dredged material," and "discharge." - Discharge of dredged and fill material into and degradation of wetlands strongly discouraged. Remedy was constructed in accordance with ARAR.
	Rivers and Harbors Act (Section 10) Prohibition of Filling a Navigable Water	Relevant and Appropriate	Rivers and Harbors Act prevents filling of a navigable water without obtaining a permit.	The environmental standards under this Act will be met.	24-Oct-02 (67 FR 65313, 33 CFR 334)	- No applicable change found.
	Fish and Wildlife Coordination Act of 1958 (16 U.S.C. 661) Protection of Wildlife Habitats	Applicable	Requires consultation with federal and state conservation agencies during planning and decision-making process which may impact water bodies, including wetlands. Measures to prevent, mitigate or compensate for losses of fish and wildlife will be given due consideration whenever a modification of a water body is proposed.	If the implementation of a remedial action results in an impact to wildlife, consultation with the U.S. Fish and Wildlife Service, RIDEM, and other federal and state agencies involved in fish and wildlife matters is required.	50 CFR 402	- No applicable change found.
Dredging (Federal)	Clean Water Act Guidelines for Specification of Disposal Sites for Dredged or Fill Material (40 CFR Part 230)	Applicable	Guidelines for the control of dredged or fill materials into the water of the United States.	Sediment from Allen Harbor and the filling of areas for created wetlands will meet the substantive requirements of the guidelines.	9-May-02 (67 FR 31129) 17-Jan-01 (66 FR 4549) 10-May-99 (64 FR 25120) 16-Aug-00 (65 FR 50108)	- Discharging of dredged material is likely to be regulable, and require complying with permitting requirements. - Clarification of definitions of "fill material," "dredged material," and "discharge." - Discharge of dredged and fill material into and degradation of wetlands strongly discouraged. Remedy was constructed in accordance with ARAR.

*Compared to that at time ROD signed and remedy implemented.

TABLE D-2 LOCATION-SPECIFIC ARARs AND TBCs FOR SITE 09 (continued)

AUTHORITY/ ACTION	REQUIREMENT	STATUS	SYNOPSIS	ACTION TO BE TAKEN TO MEET ARAR	MOST RECENT EFFECTIVE DATE*	MODIFICATIONS/IMPACT TO REMEDY
Endangered Species (Federal)	Endangered Species Act of 1973 (16 U.S.C. 1531) Protection of Endangered Species	Relevant and Appropriate	Remedial actions may not jeopardize the continued existence of federally-listed endangered or threatened species, or adversely modify or destroy their critical habitats.	The federally endangered loggerhead turtle (Caretta caretta) and federally threatened Kemp's ridley turtle (Lepidochelys kempii) occur in the waters of Narragansett Bay. If these species are identified at the landfill or the adjacent wetland, appropriate measures will be taken during construction to ensure that the remedial action does not adversely affect the species or its habitat. In addition, creation of wetlands along the harbor may provide habitat for these species.	7-Dec-99 (64 FR 68507) 50 CFR 17 50 CFR 10.13	- No other applicable change found. Remedy was constructed in accordance with ARAR.
Coastal Zone	Coastal Zone Management Act of 1972 (16 USC 3501 et seq.)	Applicable	Must conduct activities in a manner consistent with the approved state management program.	The substantive requirements of this Act will be met.	8-Dec-00 (65 FR 77123), 15 CFR 930	- No applicable change found.
Landfill in Floodplain	RCRA [40 CFR 264.18(b)]	Relevant and Appropriate	A facility located in a 100-year floodplain must be designed, constructed, operated, and maintained to prevent washout by a 100-year flood.	The requirements for closure and post-closure within the 100-year floodplain will be met, including design of the landfill cap.	10-Dec-87 (52 FR 46963)	- No applicable change found.
Wetlands (State)	Rhode Island Freshwater Wetlands Laws (RIGL 2-1-18 et seq.); Rhode Island Department of Environmental Management Rules Governing the Enforcement of the Fresh-water Wetlands Act as amended, 21 Dec.1986.	Applicable	Defines and establishes provisions for the protection of swamps, marshes and other freshwater wetlands in the state. Actions required to prevent the undesirable drainage, excavation, filling, alteration, encroachment or any other form of disturbance or destruction to a wetland.	The remedial action will be designed and constructed in a manner which will minimize and mitigate the impacts to wetlands and floodplains, including restoration of existing wetlands and construction of new wetlands.	4/1/1998 with 8/1/2001 amendments	- Wetlands in vicinity of coast now under jurisdiction of RI Coastal Resources Management Council. - "Water quality improvement project" defined. - Includes freshwater wetlands in vicinity of the coast. Remedy was constructed in accordance with ARAR
	- Section 7.02	Applicable	States that the impacts of any changes in drainage in a wetlands area must be assessed.	Impact of landfill cap on fresh water wetland areas will be assessed and mitigated if drainage is impacted.		
	- Section 7.03	Applicable	Requires that flood storage capacity be maintained at a site.	Impact of remedial actions on ground-water elevations in fresh water wetland areas will be assessed to ensure that flood storage capacity will be maintained.		
	- Section 7.04	Applicable	Requires implementation of sediment controls and surface water discharge controls to minimize sedimentation of wetland areas.	Construction runoff control methods and final cap drainage control methods will be designed to minimize sediment runoff.		
Coastal Zone (State)	Rhode Island Coastal Resources Management Law, (RIGL, Title 46, Chapter 23) and Regulations	Applicable	Creates Coastal Resources Management Council and sets standards and authorizes promulgation of regulations for management and protection of coastal resources.	Since Allen Harbor Landfill is located in a coastal area, the Navy will coordinate with the Rhode Island Coastal Resources Management Council and will ensure that all source control actions are consistent, to the maximum extent practicable, with the Coastal Resources Management Plan.	2-Jan-02	- No applicable changes found.
Endangered Species (State)	Rhode Island Endangered Species Act (RIGL 20-37-1 et seq.)	Relevant and Appropriate	Remedial actions may not jeopardize the continued existence of state-listed endangered or threatened species, or adversely modify or destroy their critical habitats.	Tern have been identified in the Davisville/Quonset area. The federally endangered loggerhead turtle (Caretta caretta) and federally threatened Kemp's ridley turtle (Lepidochelys kempii) occur in the waters of Narragansett Bay. If any of these species are identified at the landfill or the adjacent wetland, appropriate measures will be taken during construction to ensure that the remedial action does not adversely affect the species or its habitat. In addition, the final cap and the created wetlands may provide habitat for these species.	Original guidance	None.

TABLE D-3 ACTION-SPECIFIC ARARs FOR SITE 09

AUTHORITY/ ACTION	REQUIREMENT	STATUS	SYNOPSIS	ACTION TO BE TAKEN TO MEET ARAR	MOST RECENT EFFECTIVE DATE*	MODIFICATIONS/IMPACT TO REMEDY
Capping/ Monitoring (Federal)	RCRA (40 CFR 264) Subtitle C Requirements:	Relevant and Appropriate	Outlines specifications and standards for design, operation, closure, and monitoring of performance for hazardous waste storage, treatment, and disposal facilities.	Substantive RCRA requirements are considered to be relevant and appropriate and will be met.	22-Oct-98 (63 FR 56733)	- No applicable change found.
	40 CFR 264.90-254.101 Subpart F - Ground-Water Protection	Relevant and Appropriate	Ground-water monitoring/corrective action requirements; dictates adherence to MCLs unless ACLs are appropriate and establishes points of compliance.	Monitoring standards will be met through the implementation of ground-water monitoring.	30-Nov-98 (63 FR 65938)	- No applicable change found.
	40 CFR 264.110-118 Subpart G - Closure/Post Closure Requirements	Relevant and Appropriate	Establishes requirements for the closure and long-term management of a hazardous disposal facility.	Closure/post-closure requirements will be met.	22-Oct-98 (63 FR 56733) 18-Aug-92 (57 FR 37265)	- No applicable change found.
	40 CFR 264.301-264.310; Subpart N - Landfill Requirements	Relevant and Appropriate	Placement of cap over hazardous waste requires a cover designed and constructed to comply with regulations. Installation of final cover to provide long-term minimization of infiltration. Restricts post-closure use of property, as necessary, to prevent damage to the landfill cover.	Cap design, cap maintenance, and closure/post-closure substantive requirements will be met.		- No applicable change found.
	EPA Technical Guidance Document: Final Covers on Hazardous Waste Landfills and Surface Impoundments (EPA 530-SW-89-047)	To Be Considered	EPA Technical Guidance for landfill covers. Presents recommended technical specifications for multilayer landfill cover design.	Cap design will consider these standards.	1-Aug-95	- No applicable change found.
Venting/ Discharges to Air (Federal)	Clean Air Act (40 CFR 60) New Source Performance Standards (NSPS) Subpart WWW	Applicable	Requires Best Demonstrated Technology for new sources, and sets emissions limitations. Subpart WWW sets a performance standard for non-methane organic compounds emissions of 150 Mg/yr (167 tpy) for existing municipal solid waste landfills.	These standards will be met if non-methane organic emissions exceeds 150 Mg/yr (167 tpy), necessitating operation of a landfill gas management system.	8-Dec-97 (60 FR 9905, 62 FR 64656, 62 FR 64657, 64 FR 3389)	- No applicable change found.
	Clean Air Act (40 CFR 264), proposed Subpart CC (56 Federal Register 33490, 22 July 1991), proposed new standards for air pollution emissions from Treatment, Storage, and Disposal Facilities	To Be Considered	Proposed Subpart CC would apply to owners and operators of TSDFs using tanks, surface impoundments, and containers to manage hazardous waste, and to generators using tanks and containers to manage hazardous waste onsite. Specific organic emissions controls would have to be installed where the volatile organic concentration is equal to or greater than 500 ppmw. A combination of covers, closed-vent systems, and control devices would have to be used to limit the organic emissions.	If the volatile organic concentration in hazardous waste in tanks, surface impoundments, or containers onsite exceeds the 500 ppmw threshold, the appropriate controls will be added.	21-Dec-99 - Tanks and Surface Impoundments (62 FR 64659, 62 FR 64660, 64 FR 3382, 64fr3382)	- Minor revisions applicable if 500 ppmw threshold is exceeded. Emission testing or with change in handling system. must be conducted at least every 12 mo.

*Compared to that at time ROD signed and remedy implemented.

TABLE D-3 ACTION-SPECIFIC ARARs FOR SITE 09 (continued)

AUTHORITY/ ACTION	REQUIREMENT	STATUS	SYNOPSIS	ACTION TO BE TAKEN TO MEET ARAR	MOST RECENT EFFECTIVE DATE*	MODIFICATIONS/IMPACT TO REMEDY
Venting/ Discharges to Air (Federal) (cont'd)	Clean Air Act (40 CFR Sec. 61) National Emissions Standards for Hazardous Pollutants (NESHAP)	To Be Considered	Establishes emissions limitations for hazardous air pollutants and sets forth regulated sources of those pollutants.	Air control technologies will be used to control emissions of hazardous air pollutants at the site.	40 CFR Sec. 61 (66 FR 16318, S 112)	- No applicable change found in 40 CFR 61 Standards of Performance.
	Clean Air Act, Section 5 171 through 178, 42 USC ..7471-7478 (Requirements for Non-Attainment Areas)	Applicable	RI has adopted State Implementation Plan (SIP) requirements (approved and enforceable by EPA) which meet the New Source Review requirement of the CAA. These provisions require that new or modified major sources of VOC and NOx (defined as a source which has the potential to emit 50 tpy) install equipment to meet Lowest Available Emissions Rate, which is set on a case-by-case basis and is either the most stringent emissions limitation contained in any SIP for that category or source or the most stringent emissions limitation which is achieved for the source. NSR requirements apply to non-attainment pollutants (i.e.., in RI, VOC and NOx).	Based on current information, the threshold of 50 tpy will not be exceeded; if, at a later time it is exceeded, these requirements will be met.	original	None
	Clean Air Act, Section 5 160 through 169A - Prevention of Significant Deterioration Provisions	Applicable	RI has adopted SIP requirements (approved and enforceable by EPA) which meet the Prevention of Significant Deterioration (PSD) requirements of the CAA. These provisions require that new or modified major sources of attainment pollutants (in Rhode Island, SO2, CO, NO2, lead, and particulates), install equipment to meet Best Available Control Technology.	Based on current information, the threshold of 25 tpy will not be exceeded; if at a later time it is exceeded, these requirements will be met.	original	None.
Treatment (Federal)	RCRA 40 CFR 261 Identification and Listing of Hazardous Wastes	Applicable	Defines those wastes which are subject to regulation as hazardous wastes under 40 CFR 262-265.	Wastes generated during remedial actions will be evaluated to determine if they are listed or characteristic hazardous wastes.	6-Aug-98 and 8-Nov-00 (63 FR 42109)	- Yr 2000 amendments not applicable to COCs at site.
	Toxic Substances Control Act (TSCA) (40 CFR 761.125)	Applicable	Establishes PCB cleanup levels for soils and solid surfaces.	Applicable standard for PCB soil removal under ESD and for any PCB remaining on site above clean up standards.	26-Dec-00 (65 FR 81373) 6-Aug-98 (63 FR 42109) 29-Jun-98 (63 FR 35383) 40 CFR 761.130(a)	- EPA is temporarily deferring the requirement that PCBs be considered a "constituent subject to treatment" when PCB is present in soils that exhibit Toxicity Characteristic for metals. - Under NCP, all PCB spills greater than 1 lb must be reported to National Response Center. - If PCB limit is exceeded, may refer to new regs. allowing risk-based criteria to be used. - Remediation waste must be handled and disposed of in accordance with 40 CFR 761. Remedy was constructed in accordance.
	EPA Guidance on Remedial Actions for Superfund Sites with PCB Contamination (OSWER Directive No 9355.4-01, August 1990)	To Be Considered	Describes recommended evaluation and remediation approaches for PCB-contaminated sites.	To be considered in the remediation, including the ESD Removal Action, such that PCB contamination is adequately addressed.	original guidance	None
	Interim Guidance on Establishing Soil Lead Cleanup Levels at Superfund Sites (OSWER 9355.4-02)	To Be Considered	Sets forth as an interim soil cleanup level for lead at 500 to 1,000 mg/kg.	To be considered for the development of PRG.	original guidance	None.

TABLE D-3 ACTION-SPECIFIC ARARs FOR SITE 09 (continued)

AUTHORITY/ ACTION	REQUIREMENT	STATUS	SYNOPSIS	ACTION TO BE TAKEN TO MEET ARAR	MOST RECENT EFFECTIVE DATE*	MODIFICATIONS/IMPACT TO REMEDY
Drainage/ Discharge/ Hydraulic Control (State)	RI Water Pollution Control Act					
	RI Water Quality Regulations for Water Pollution Control (RIGL 46-12, et seq.) RI Water Quality Standards	Applicable	Establishes general requirements and effluent limits for discharge to area surface water bodies.	In compliance with these regulations, RIPDES requirements pertaining to storm water discharges will be met.	23-Jun-00 (EVM 112-88.97-1)	The ongoing storm water discharges are in compliance with the regulations. There is no impact to the remedy.
	Regulations for the RI Pollutant Discharge Elimination System (RIPDES) (RIGL 46-12, et seq.)	Applicable	Permits contain applicable effluent (i.e., technology - based and/or water quality - based), monitoring requirements, and standards and special conditions for discharges.	Storm water discharge improvements would be designed to provide compliance with these regulations.	27-Feb-02 (Ch 46-12, 42-17.1, 42-35)	The ongoing storm water discharges are in compliance with the regulations. There is no impact to the remedy.
Capping/ Monitoring (State)	RI Hazardous Waste Management Act of 1978 (RIGL 23-19.1 et seq.) Hazardous Waste Management Rules and Regulations	Relevant and Appropriate	Rules and regulations for hazardous waste generation, transportation, treatment, storage, and disposal. They incorporate, by reference, the federal RCRA requirements.	Substantive requirements applicable to transport, treatment, storage, and disposal of hazardous waste will be met and adhered to.	2-Dec-02 (DEM OWM-HW12-02)	- No applicable changes found.
	Section 7	Relevant and Appropriate	Establishes permitting requirements for hazardous waste treatment, storage, and disposal facilities.	Remedial actions involving treatment, storage, or disposal of hazardous waste will meet these requirements.		
	Section 8	Relevant and Appropriate	Contains requirements for landfill closure, ground-water monitoring, general waste analysis, security procedures, inspections, safety, and training for permit applications for currently operating and future facilities.	Substantive portions of this section will be met.		
	Section 9	Relevant and Appropriate	Contains operational requirements for treatment, storage, and disposal facilities, including proper management and conditions for tanks, ground-water monitoring, inspections, training, preparedness and prevention, and contingency planning and emergency procedures.	Substantive portions of this section will be met.		
	Section 10	Relevant and Appropriate	Contains design and operations requirements for land disposal facilities, including landfills.	Substantive portions of this section will be met.		
	RI Hazardous Waste Management Act of 1987 (RIGL 23-19.1 et seq.)	Relevant and Appropriate	Defines Type 6 - Extremely hazardous waste as including wastes which contain PCB at a concentration of 50 mg/kg or greater.	Requirement will be met in handling hazardous wastes.	(DEM OWM-SW2)	
	Rules and Regulations for Solid Waste Management Facilities	Relevant and Appropriate	Defines solid waste as including any soil, debris, or other material with a concentration of PCBs of 10 ppm or greater.	Requirement will be met in handling hazardous wastes.		

TABLE D-3 ACTION-SPECIFIC ARARs FOR SITE 09 (continued)

AUTHORITY/ ACTION	REQUIREMENT	STATUS	SYNOPSIS	ACTION TO BE TAKEN TO MEET ARAR	MOST RECENT EFFECTIVE DATE*	MODIFICATIONS/IMPACT TO REMEDY
Capping/ Monitoring (State)	RI Refuse Disposal Act Rules and Regulations for Solid Waste Management Facilities				1-Apr-01 (DEM OWM-SW1)	- No applicable change found.
	Section 14.12	Relevant and Appropriate	Sets performance standards for solid waste landfill covers.	Design of the final landfill cover will consider these performance criteria.		
Venting/ Discharges to Air (State)	RI Clean Air Act (RIGL Title 23, Chapter 23) General Air Quality and Air Emissions Requirements					
	RI Air Pollution Control Regulations, RI Dept. of Health, Div. of Air Pollution Control, effective 8/2/67, most recently amended 5/20/91					
	Regulation No. 1 - Visible Emissions	Applicable	No air contaminant emissions are allowed for more than 3 minutes in any one hour which are greater than or equal to 20% capacity.	Air emissions from remedial actions will meet this standard.	22-Feb-77	- No applicable change found.
	Regulation No. 5 - Fugitive Dust	Applicable	Requires that reasonable precaution be taken to prevent particulate matter from becoming airborne.	Onsite remedial actions will use good industrial practices to prevent particulate matter from becoming airborne.	16-Sep-96	- No applicable change found.
	Regulation No. 7 - Emissions Detrimental to Person or Property	Applicable	Prohibits emissions of contaminants which may be injurious to human, plant, or animal life or cause damage to property or which reasonably interferes with the enjoyment of life and property.	All emissions will meet this requirement or gas treatment will be required.	28-Mar-93	- No applicable change found.
	Regulation No. 9 - Approval to Construct, Install, Modify, or Operate	Applicable	Establishes guidelines for the construction, installation, modification, operation, or permitting of potential air emission units. Establishes permissible emission rates for contaminants.	Technologies involving construction, installation, modification or operation of air emission units will meet these requirements.	30-Jul-98 10/1/99 Technical Rev.	- No applicable change found.
	Regulation No. 15 - Control of Organic Solvent Emissions	Applicable	Limits the amount of organic solvents emitted to the atmosphere.	If emissions exceed limits in this regulation, emission controls will be designed and implemented to meet these requirements.	8-Mar-96	- No applicable change found.
	Regulation No. 17 - Odors	Applicable	Prohibits the release of objectionable odors across property lines.	No remedial action or air emissions will emit objectionable odors beyond the facility boundary, as practicable.	22-Feb-77	- No applicable change found.
	Regulation No. 22 - Air Toxics	Applicable	Prohibits the emission of specified contaminants at rates which would result in ground level concentrations greater than acceptable ambient levels or acceptable ambient levels with LAER, as set in the regulation.	If air emissions contain regulated substances, air emissions control equipment will be used as necessary to meet these standards.	19-Nov-92	- No applicable change found.

APPENDIX D

RESPONSES TO COMMENTS FROM REGULATORY AGENCIES

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Response to EPA's 23 January 2003 Comments to the Draft Five-Year Review

Response to EPA's 29 January 2003 Comments to the Draft Five-Year Review

Response to EPA's 30 January 2003 Comments to the Draft Five-Year Review

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Response to EPA's 11 March 2003 Comments to the Revised Draft Five-Year Review

Response to EPA's 25 March 2003 Comments to the Revised Draft Five-Year Review

Response to EPA's 26 March 2003 Comments to the Revised Draft Five-Year Review

RESPONSE TO COMMENTS DATED 23 JANUARY 2003 FROM U.S. ENVIRONMENTAL PROTECTION AGENCY ON THE FIRST FIVE-YEAR REVIEW REPORT OF DECEMBER 2002 FOR FORMER NAVAL CONSTRUCTION BATTALION CENTER (NCBC) DAVISVILLE NORTH KINGSTOWN, RHODE ISLAND

Comment 1: It's OK to describe the grouping of "sites" as the authors did, however, under each "site" they should follow the model in the OSWER guidance. – I suggest the authors re-write the report using the Section headings in EPA's June 2001 "Comprehensive Five-Year Review Guidance" document. It would helpful if the authors organized the report for each "site" using Chapter 4 and Appendix E, pages E-5 through E-8 and referenced E-9 through E-32 for the details to be included in each section.

Response— The document has been reorganized and resubmitted as a Revised Draft using the format sections in the EPA guidance document for the two sites with signed RODs and the sites that are still in the remedial investigation stage; i.e., no signed RODs. However, Ms. Christine Williams (U.S. EPA -Region I) said that this was not necessary for the No Further Action sites (Appendix A).

Comment 2: Include an EPA title page with signature and acceptance date for the 5-year review report.

Response— Although this has been included in the Revised Draft version of the document, this page may have to be removed because typically EPA sends an acceptance letter and only the Navy signs the document. The Navy guidance is changing and may include more details which will address a signing procedure.

Comment 3: Include a completed "Five-Year Review Summary Form." A blank example can be found on page E-17 of the above referenced guidance.

Response— This has been included in the Revised Draft version of the document.

Comment 4: The author's included a brief chronology for the each "site" evaluated, but they should also include a chronology for the entire Site. The Site chronology should include significant industrial activities and contamination history that has occurred at the Site, as well as the date of initial discovery of problem, dates of pre-NPL responses, if any, and date of NPL listing.

Response— The facility history is included in Section 1.1.2 of the Revised Draft version of the document. The chronology for each of the sites in Chapters 2 and 3 have been expanded to include dates of activities resulting in releases, dates of pre-

NPL studies and response, date of discovery of the problem (Initial Site Assessment in 1984), and date of NPL listing.

Comment 5: The authors should include a section relating to the "Five-Year Review Process" and summarize from the draft report information on notification of potentially interested parties of the initiation of the review process, community involvement, and document review. I did see the references section and that should suffice, if you agree with this approach. Included in this Section would be any interviews conducted as part of the 5-year review process. Interview information should include person(s) interviewed, dates and locations, interview documentation, and a summary of the interview. If the Navy didn't conduct interviews they should indicate why they didn't think interviews were necessary.

Response— This has been addressed in Sections 2.1.6.6, 2.2.6.6, 3.1.6.6, and 3.2.6.6 of the Revised Draft version of the document.

Comment 6: The authors need to include a Section on "Technical Assessment" and answer questions A, B and C for each "site" see Section 4 of the OERR 5-year review guidance. This is an important part of the report.

Response— This has been addressed in Sections 2.1.7, 2.2.7, 3.1.7, and 3.2.7 of the Revised Draft version of the document.

Comment 7: For each "site" the authors should briefly summarize the issues identified during the 5-year review process and make a determination of whether the issues identified affect current or future protectiveness.

Response— This has been addressed as possible in Sections 2.1.8, 2.2.8, 3.1.8, and 3.2.8 of the Revised Draft version of the document.

Comment 8: The authors included a recommendation section(s) in the draft report. I suggest reformatting that section and include a table with the following headings: issue identified, recommendation/follow-up action, party responsible for completing the follow-up action, oversight party (if appropriate), milestone date for completing the follow-up action, and whether it affects current and/or future protectiveness - this is a simple Yes or No answer. See guidance.

Response— This has been addressed as possible in Sections 2.1.9, 2.2.9, 3.1.9, and 3.2.9 of the Revised Draft version of the document.

Comment 9: I strongly recommend that the authors use one of the protectiveness statement in Section 4.5.1 of the OERR 5-year review guidance. Also see page E-30 part X for additional explanation.

Response— This has been addressed as possible in Sections 2.1.10 and 2.2.10.

Comment 10: Because the Site is not construction complete the authors need to provide a protectiveness statement for each "site." In subsequent 5-year reviews, once the Site reaches construction completion the 5-year review should also include a protectiveness statement for the entire Site.

Response— Comment noted and a protectiveness statement has been provided in the Revised Draft version of the document for each "site" with a ROD.

Comment 11: Also, the Navy may ask you if all sections of the 5-year review report need to be completed? Generally, we've answered this question with - yes. For national consistency, all reports should contain all sections as provided for in the guidance. If there was no information for a required section, simply state that this section isn't appropriate and state the rationale.

Response— Comment noted. Refer to the response to Comment 1, above.

RESPONSE TO COMMENTS DATED 29 JANUARY 2003 FROM U.S. ENVIRONMENTAL PROTECTION AGENCY ON THE FIRST FIVE-YEAR REVIEW REPORT OF DECEMBER 2002 FOR FORMER NAVAL CONSTRUCTION BATTALION CENTER (NCBC) DAVISVILLE NORTH KINGSTOWN, MODE ISLAND

Comment 1: Page 1, Section l.l, 2nd paragraph, should be revised to cite Section 121(c) of CERCLA, 42 U.S.C. sec. 9621(c), as requiring a review no less often than each five years after initiation of the such remedial action. The standards cited in the Navy's text are required by the statute (Public Law 99-499, Sec. 121(b)), rather than by Navy policy.

Response— The referenced section has been revised in the Revised Draft version of the document as follows:

The following presents the requirements for five-year reviews:

a. *The statutory requirement for five-year review was added to Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) as part of the Superfund Amendments and Reauthorization Act of 1986 (SARA). A five-year review is required when* ***both*** *of the following conditions are met, whether the site is on the National Priorities List (NPL) or not:*

   1) *Upon completion of the remedial actions at a site, hazardous substances, pollutants, or contaminants will remain above levels that allow for unlimited use and unrestricted exposure. For example, if a site is restricted to industrial use because hazardous substances, pollutants, or contaminants remain above levels that allow for unlimited use and unrestricted exposure, five-year reviews must be conducted.*

   2) *The Record of Decision (ROD) or Decision Document (DD) for the site was signed on or after October 17, 1986 (the effective date of SARA).*

b. *CERCLA §121(c), as amended, states:*

   If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each five years after the initiation of such remedial action to assure that human health and the environment are being

protected by the remedial action being implemented. In addition, if upon such review it is the judgment of the President that action is appropriate at such site in accordance with section [104] or [106], the President shall take or require such action. The President shall report to the Congress a list of facilities for which such review is required, the results of all such reviews, and any actions taken as a result of such reviews.

c. The National Contingency Plan (NCP), 42 US.C, § 9621(c), implementing regulations, 40 C.F.R. Part 300.430(f)(4)(ii), provide:

If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after initiation of the selected remedial action.

Comment 2: Page 2, Section 1.l, 5th paragraph, should also cite that the document has been prepared in accordance to EPA guidance.

Response— The referenced section has been revised in the Revised Draft version of the document as follows:

This Five-Year Review Report has been prepared in accordance with the U.S. Environmental Protection Agency (EPA) Comprehensive Five-Year Review Guidance, June 2001, EPA 540-R-01-007, OSWER No. 9355.7-03B-P, and the US. Department of the Navy Policy for Conducting Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Statutory Five-Year Reviews (US. Navy 2001).

Comment 3: Page 7, 4th paragraph - This paragraph should also cite that land use restrictions, with compliance monitoring, have been placed on the land to ensure the property is not used in a manner that conflicts with the remedy.

Response— The following sentence has been added to the referenced paragraph which is now in Section 2.1.3.2 (Land and Resource Use) of the Revised Draft version of the document:

Additionally, land-use restrictions, with compliance monitoring, have been placed on the land to ensure the property is not used in a manner that conflicts with the remedy.

Comment 4: Page 9, 1st paragraph -Need to clarify the sentence to be clear that the restriction on construction without adequate ventilation is only on the southern half of the property.

Response— The referenced sentence, now located in Section 2.1.4 (Remedial Actions) of the Revised Draft version of the document, has been revised as follows:

> *In addition, any construction or development of any building, structure, facility, or other improvement within the southern portion of the property (Figure 3) shall be designed and constructed to include adequate ventilation as approved by the Navy, EPA, and RIDEM.*

Comment 5: Page 24, Sec 3.1.3 -There is no discussion of how the Navy is ensuring that the current owner is not improperly using the area and interfering with the investigations. Same comment also for Sec. 3.1.6.

Response— This issue is addressed in Section 3.1.3.2 (Land and Resource Use) of the Revised Draft version of the document.

Comment 6: Page 30, Sec. 3.2.6 - Same comment as for Sec. 3.1.3.

Response— This issue is addressed in Section 3.2.3.2 (Land and Resource Use) and Section 3.2.6.5 (Site Inspections) of the Revised Draft version of the document.

RESPONSE TO COMMENTS DATED 30 JANUARY 2003 FROM U.S. ENVIRONMENTAL PROTECTION AGENCY ON THE FIRST FIVE-YEAR REVIEW REPORT OF DECEMBER 2002 FOR FORMER NAVAL CONSTRUCTION BATTALION CENTER (NCBC) DAVISVILLE NORTH KINGSTOWN, RHODE ISLAND

GENERAL COMMENTS

Comment 1: Site 07: Although the remedy for site 07 does not appear to be "unprotective" at this time, EPA's review, which was presented at the meeting of December 12, 2002 identified a number of issues requiring further work prior to next monitoring event (ME #3). At the meeting, EPA presented an updated conceptual site model (CSM) which suggests the possibility of more than one release area. As such, the general area considered to be the "source area" is perhaps larger than the current LTMP considers. In addition, several ground water flow paths were identified which are either not monitored presently, or are only partially monitored. Travel times are not well understood, which hampers data evaluation and interpretation of trends. Although EPA concurs that it is premature to formally determine contaminant trends, our comprehensive evaluation of the site database suggests that several of the plumes do not appear to be "stable" (i.e., at a quasi steady-state), but rather, may be advancing. Additional control points (i.e., monitoring wells) will therefore be needed in both the source areas and down-gradient plume regions. Lastly, once ground water flow pathways are better understood, additional work may be needed in terms of identifying and sampling areas of ground water discharge to surface water and sediment. EPA's specific recommendations with respect to groundwater/surface water interactions are listed in General comment 2, below. With respect to the other revised elements of the CSM, EPA concurs with the Navy's recommendations listed in Section 2.1.7. In addition, the following specific recommendations were presented during the meeting of December 12, 2002, and are included here for completeness:

- In addition to a new shallow monitoring well at the MW-27D area, a new "I" well is also needed;

  Response— The Navy will assess the need for an "I" well at this location based on the results of the planned "S" and "D" wells that are dependent on availability of Navy funds.

- Similarly, a new "I" well is also recommended at the SB-11 location;

Response— The Navy will assess the need for an "I" well at this location based on the results of the existing "S" well and the planned "D" well that is dependent on availability of Navy funds.

- In addition to the new "S" and "D" wells proposed for the MIP-C location, a new "I" well is also recommended.

  Response— The Navy will assess the need for an "I" well at this location based on the results of the planned "S" and "D" wells that are dependent on availability of Navy funds.

- Continuous split-spoon stratigraphic data is needed for all new wells;

  Response— Continuous split-spoon sampling of the soil for stratigraphic data would be planned for at least the deepest completed well in the overburden at new locations.

- The hydraulic conductivity database for the site is incomplete. Slug tests are needed at all locations which have not yet been tested. In particular, all existing shallow monitoring wells as well as all new monitoring wells should be slug-tested.

  Response— Comment noted. Based on review of the Phase III RI, shallow well locations MW07-01S through MW07-26S were slug tested by TRC or EA except MW07-01S, MW07-02S, MW07-03S, and MW07-07S (insufficient water column). Additionally, MW07-33S, MW07-35S, and MW07-36S need to be slug tested. New wells that are installed would include slug testing.

- Additional source area monitoring should be added to the LTMP. In particular, MW07-31I and MW07-05D/I/R should be included for sampling in all future LTM events.

  Response— The Navy is considering this request. Additionally, at location MW07-05 there are "S", "D", and "R" wells, but no "I" well.

- All "R' wells should be included for sampling in all future LTM events.

  Response— The Navy is considering this request.

- Additional focus is needed along the site shoreline (see general comment 2, below).

  Response— Refer to the response to Comment 2.

Comment 2: Although the remedy for site 07 does not appear to be "unprotective" at this time, it is not clear that previous sampling locations at the site shoreline have been optimized to the degree needed. EPA's presentation at the meeting of December 12, 2002 highlighted a number of uncertainties which bear on the an evaluation of risk at the site shoreline. Ground water at P07-05, -07, -09, -10, -21, -22, and -23 has been observed to be above PALS. Although EPA concurs that additional data will be needed to statistically evaluated contaminant trends, our review of the site database suggests that several plumes may be advancing toward Allen Harbor, the Allen Harbor entrance channel, and Narragansett Bay. Additional work is therefore needed prior to Monitoring Event 3 (ME #3). In particular, given the apparent advancing nature of the plumes, the "snapshot" passive vapor diffusion (PVD) sampling data collected in 1998 at the Site 07 shoreline should be updated to insure that current shoreline piezometer locations are appropriately located. In particular, EPA's review indicated the possibility of plume discharge to Allen Harbor along the southwestern portion of the site. The 1998 PVD survey had very few samplers in this portion of the site, so data here is incomplete. As a result, while EPA recommends repeating PVD sampling at all previous locations, we recommend an increased sampling density in the shoreline areas roughly between P07-11 and P07-23. In order to expedite getting the needed information prior to ME #3, EPA is willing to perform the requested PVD work. Please see also, general comment 1, above.

Response— The Navy prefers active sampling using piezometers to obtain quantitative data rather than qualitative data from passive sampling devices. Therefore, for Monitoring Event (ME) 03 in February 2003, the Navy added nine piezometer locations between P07-18 and P07-19 along the Site 07 shoreline where sampling has not occurred during the previous two monitoring events.

Additionally, between the 12 December 2002 BCT meeting and ME 03, the severe winter conditions did not appear to be conducive to PVD work even if EPA had tried. The PVD sampling devices would probably have been pulled out of the ground by the water level variations from the tides along with the ice at the shoreline.

Comment 3: Site 09:

Response— Comment was not complete, so response was not possible.

Comment 4: It would be useful to state in both Sections 3.1 and 3.2 that it is possible that the CVOC plume emanating from the PR-58 NIKE site extends beneath sites 02 and 03, perhaps even into the site 16 area, and that future work at Site 16 and the PR-58 NIKE site, as well as ongoing monitoring at sites 02 and 03 will seek to clarify this possibility.

Response— Currently the Navy does not share EPA's belief in this hypothetical connection between the Nike PR-58 Site/Site 03 area with Site 16 and is waiting for the results of the Phase II RI at Site 16 before further consideration of this hypothesis.

Comment 5: It may be necessary to revise and/or expand the LTMP for Sites 02 and 03 and Study areas 01 and 04, depending on the findings of ongoing characterization work on the up-gradient PR-58 NIKE site. Similarly, if a "pilot test" is initiated on the PR-58 NIKE site to evaluate an emerging remedial technology, it is likely that enhancements to the monitoring network will be required both on the PR-58 NIKE site as well as the down-gradient properties, including Sites 02 and 03 and Study areas 01 and 04.

Response— This should not be addressed now, but in the Five-Year Review Report that includes the results of USACE's additional characterization and/or the 'pilot test' at the Nike PR-58 Site.

Comment 6: Site 16: EPA notes that the description/chronology of the investigation at Site 16 presented in the text (e.g., Pg 29 of 30, 3rd paragraph) does not appear to be up-to-date, and does not appear to be reflective of the Site Plan shown on Figure 9. For example, it is no longer believed that the contamination at the site "starts at the southern portion of the northeast end of Building 41." Rather, the most recent information suggests that the plume not only extends further to the north and east, but also perhaps further to the south and west, and numerous regulatory comments have been submitted on these issues. Although the Phase III RI, which the text alludes to, will shed light on these issues, it would be useful to update the text of the Five Year Review somewhat to more accurately reflect the current state of the investigation.

Response— To address the issues in this comment, the subject text has been revised as follows and included in Section 3.2.6.4 of the Revised Draft document:

> *Based on the understanding from the Phase I RI, the main portion of the dissolved VOC plume detected in deep ground water appears to be present beneath an area ranging from the vicinity of the southern portion of the northeast end of Building 41 northeast to at least the southern edge of the harbor (well clusters MW16-04 and MW16-05) and at least 100 ft east of Allens Harbor Road (well clusters MW16-27 and MW16-28) (Figure 9). Figure 9 shows the locations of both the Phase II RI wells (typically MW14-01 through MW16-29) and wells installed for the Phase II RI (typically wells MW16-30 through MW16-55). Results of a Phase I RI sampling event (included resampling of the Phase I RI wells) will be available Spring 2003. The ongoing Phase II RI is planned to further characterize the nature and extent of the plume detected during the*

Phase I RI, suspected contamination beneath the former vapor degreasing unit and under the Cosmolene tanks of the former Building 41, along with the potential southern extension and/or additional source area of the CVOC plume in the area between former Building 41 and Building E-319 in the railroad spur area; the potential western extension and/or additional source area of the CVOC plume, and the eastern extent of the CVOC plume in deep ground water.

Comment 7: References: It may be useful to include formal regulatory comments in the list of references for completeness in view of the fact that the 5-Year Review reflects a "work in progress" for which the outcome is not yet certain.

Response— The responses to EPA and RIDEM comments to the Draft Five-Year Review Report of the former NCBC Davisville facility will be included in an appendix of the final document.

SPECIFIC COMMENTS

Comment 8: Table of Comments; Page 2 of 2: Is Section 3.2.2 mis-named? It would not seem appropriate to identify "remedy components" for a site where the characterization is still ongoing.

Response— It is assumed that the commenter is referring to the Table of Contents. The Table of Contents with consistently titled subsections was agreed to between the Navy, EPA, and RIDEM by 31 October 2002. However, the Table of Contents provided in the EPA guidance for five-year reviews was used at the request of EPA HQ for the Revised Draft version of the document.

Comment 9: Page 3 of 30, Facility Location and Description: The description of the facility should include a brief mention of the former PR-58 NIKE missile site given its importance to the ongoing investigation at Sites 02 and 03 and study areas 01 and 04.

Response— The following paragraph was added to the end of the end of Section 1.1.2 (Facility Location and Description):

Adjacent and west of a portion of the former NCBC Davisville facility is a former Nike missile facility (Nike Battery Site PR-58) (Figure 1) that included three underground missile silos, a refueling area, a missile assembly and test building with an underground storage tank (UST), a generator building with a 4,000-gal UST, and personnel quarters (Metcalf & Eddy 1994). The facility (a Nike "Ajax"-only site) was constructed during the initial round of Nike Site construction in the mid-1950s and was equipped with short-range, conventionally-armed Nike Ajax missiles.

The PR-58 facility was deactivated in 1962. This property then had two other reported historical activities. The Navy used the area west of the missile silos as a Disaster Recovery Training Area between 1964 and 1974 (SEC 1988). In 1978, the GSA transferred ownership to RIPA (now RIEDC). RIPA leased 2.2 acres of land to Peabody Clean Industries between 1980 and 1982 for use as a hazardous waste tank farm. Peabody Clean Industries ceased operations in 1982 and conducted closure activities through 1983 (ERA 1984). In 1983, RIDEM directed Peabody Clean Industries in a cleanup of contaminated soil that had resulted from the Peabody Clean Industries activities at the site. RIPA (now RIEDC) removed the 4,000-gal UST at Building 345 and demolished many structures as part of cleanup/closure activities. Details of this property, located adjacent and upgradient of a portion of NCBC, are provided in the report "Characterization of CVOC Contamination at the Former PR-58 Nike Site and Adjacent Navy NCBC Davisville Site 03" (EA 2001g;).

Comment 10: Page 6 of 30, 2nd Paragraph: The detailed discussion of the source area extent, nature of the release, etc. is helpful. Suggest identifying the source area on Figure 2 with a stippled (or similar) pattern.

Response— An outline of the potential area of CVOC release(s) was added to Figure 2.

Comment 11: Page 6 and 7 of 30: The RIDEM ground water classifications do not appear to be consistent with what has been learned about site ground water over the course of the investigation. In addition, given what is known about the plume(s), it would appear appropriate to supply additional cautionary information to end-users (e.g., shellfishers) with respect to areas which may not be technically "closed" to shellfishing, but where plume discharges are known or suspected, even if current data does not suggest a "risk." In that manner, users will be able to make informed decisions concerning the advisability of shellfish harvesting given the current uncertainties and unclear trends with respect to the Site 07 plumes. Please see General Comment, above.

Response— The RIDEM classifications were apparently established years ago and the Navy can not make them "consistent with what has been learned about site ground water."

The data do NOT indicate unacceptable risk, so the Navy does not see what type of "caution" would be appropriate and consistent with "no unacceptable risk."

Comment 12: Page 7 of 7, 3rd para.: Although the remedy for site 07 does not appear to be unprotective at this time, EPA's presentation at the meeting of December 12, 2002 highlighted a number of uncertainties which bear on the an evaluation of risk at the site shoreline. It is not clear that previous sampling locations at the

site shoreline have been optimized to the degree needed. Additional work is needed. Please see general comments 1 and 2, above. In particular, EPA identified several ground water flow paths which will require closer evaluation, and additional work is also needed with respect to groundwater/surface water interactions. In particular, once ground water flow pathways are better understood, additional work may be needed in terms of identifying and sampling areas of ground water discharge to surface water and sediment.

Response— The text in the Draft Five-Year Review already indicated that additional investigation is needed to at least:

> *To refine the understanding of the hydrogeology and source for the CVOC detected in the May 2002 samples from piezometers located along the site shoreline with Allen Harbor and if those detected concentrations are typical or may increase/decrease, add five monitoring wells (MW07-35D, a shallow and deep overburden well pair at SB07-05, and a shallow and deep overburden well pair between MW07-04 and MW07-35) (MW07-35S and MW07-36S were installed during October 2002).*
>
> *To refine the understanding of the CVOC plume migration pathway in the central portion of the site (MW07-26S and MW07-27D vicinity), e.g., is it southwest toward MW07-19 and MW07-21, or east, add three monitoring wells (MW07-27S and a shallow and deep overburden well pair approximately 125–150 ft east of MW07-26S). The Navy is considering adding these wells after ME 03 if funding is available.*

These statements were incorporated into the "Issues" (Section 2.1.8) and "Recommendations and Follow-Up Actions" (Section 2.1.9) of the Revised Draft version of the document. Additionally, refer to the responses to Comments 1 and 2, above.

Comment 13: Page 8 of 30, section 2.1.1.1 and Figure 2: Figure 2 should be updated to include locations for MW07-35S and MW07-36S which are mentioned in the text in this section.

Response— These two wells are shown on Figure 2 in the Revised Draft version of the document (the surveyed location data became available on 14 February 2003).

Comment 14: Page 8 of 30,10th bullet and Section 2.1.2, 1st para.: It is agreed that a key objective for the Site 07 remedy is to "ensure that the discharge of ground water to wetlands and offshore areas continues to pose no unacceptable risks from COC." However, EPA's review of recent site data presented during the meeting of December 12, 2002 suggests additional actions are needed in order to improve monitoring of this objective. Please see General Comment 1, above.

Response— Refer to the responses to Comments 1, 2, and 12, above.

Comment 15: Page 9 of 30, 3rd bullet: Please clarify whether or not explosive, propellants, or other COCs potentially in munitions were factored into soil and ground water analytical data used to support closure of the bunkers.

Response— No, the bunkers were used for storage with no reported history of a release or open burn/open detonation activities.

Comment 16: Page 10 of 30, Section 2.1.3; Assessment of Remedy Protectiveness; and Page 11 of 30, Section 2.1.4, Areas of Non-compliance: Although EPA concurs that it is premature to statistically evaluate contaminant trends, our comprehensive evaluation of the site database suggests that several of the plumes do not appear to be "stable" (i.e., at a quasi steady-state), but rather, may be advancing. In this light, the seven piezometer locations where ground water PALS were exceeded should be viewed with some caution. Additional work needs to be directed to the ground watersurface water pathway prior/during ME#3 (please see General Comments 1 and 2, above). To be conservative in the interim, would it be appropriate to issue an advisory stating the location, nature and levels of risk presented by the current data relative to the PAL exceedances?

Response— Refer to the responses to Comments 1 , 2, 11, and 12, above.

Comment 17: Page 11 of 30; Section 2.1.7; Recommendations; and Figure 2: Figure 2 should be updated to include locations for MW07-35S and MW07-36S which are mentioned in the text in this section as well as on page 8 of 30, Section 2.1.1.1. Note also that in this section (2nd to last sentence), MW-21 is erroneously referred to as "MW-221." Please fix this typo. EPA concurs with the Navy's recommendations listed here. However, in addition, EPA made the several additional recommendations during the meeting of December 12, 2002 which are listed in General Comment 1, above.

Response— Figure 2 has been updated with the locations for MW07-35S and MW07-36S and the typo has been corrected. Also, refer to the response to Comment 1, above.

Comment 18: Page 14 of 30, Section 2.2.1.l; Significant Events: The damage to a significant number of the site monitoring wells described in the preceding paragraph should be placed on the chronology, in addition to the date at which the discovery of the damage was made. Mitigative measures should also be placed on the chronology. It does not appear that sufficient efforts have been made to re-instate the compromised monitoring network. As a result, it is not clear that the conclusions offered for this site are appropriate. See General Comment _____, above.

Response— As stated in the text, all but two of the damaged wells seem to be acceptable for now, and those two wells (MW09-14Iand MW09-09D) are recommended for replacement. However, because such well replacement work (and the potential installation of other wells at EPA-recommended locations) would involve penetration of the multimedia cap, it was agreed during the 8 November 2001 BRAC Cleanup Team (BCT) Meeting, that decisions regarding the replacement of damaged wells and/or the installation of additional monitoring wells would be delayed for two years pending the collection and assessment of monitoring data during that time, including probable changes resulting from capping of the landfill.

Comment 19: Page 17 of 30, 2nd bullet: The text states that, "The progression of wetland development is being monitored over time to determine the feasibility of sustainability." Please indicate what criteria would be used to "determine the feasibility of sustainability." What types of monitoring will be used to supply information to make this determination?

Response— Visual observation and photo documentation is being accomplished to assess any net loss or gain of the wetland species during semi-annual landfill inspections. The continued presence of wetland species over time would provide qualitative evidence of sustainability.

Comment 20: Page 19 of 20, 1st para.: It is not clear that the range of COCs detected, and their locations, support a determination of "protectiveness." The data could be viewed with the opposite location, and it is perhaps more appropriate to indicate that the data are not conclusive, and that additional efforts will be undertaken to clarify the situation. For example, it is not encouraging that PCBs were detected above the PAL for both ME 01 and ME 02 at SED09-01, which is located in the general area of the 1999 supplemental PCB removal. EPA's review of the ME 3 report identified numerous recommendations in this regard, which are summarized in General Comment _____, above.

Response— The following has been included in Section 2.2.6.4 (Data Review) of the Revised Draft Five-Year Review document:

> *The ME 01 through ME 04 results of the sediment samples indicated inconsistent exceedance of PAL for only a few constituents in a few locations (Table 4):*
>
> - *4,4'-DDE (ME 03, SED09-09 at 9.5 micrograms per kilogram (µg/kg) versus 7.65 µg/kg for the PAL)*

- *4,4'-DDT (ME 01, SED09-01 at 62J µg/kg versus 6 µg/kg for the PAL)*
- *Alpha-chlordane (ME 03, SED09-01 at 21 µg/kg versus 6 µg/kg for the PAL)*
- *Total PCB (ME 01, ME 02, and ME 04 for SED09-01 at 1,600 µg/kg, 220 µg/kg, and 910 µg/kg, respectively, versus 215 µg/kg for the PAL)*
- *Several PAH (ME 04, SED09-10 overall 77,260 µg/kg versus the 44,792 µg/kg PAL for total PAH).*

The small number of compounds detected and the inconsistent detections of these analytes across the area sampled do not support a protectiveness problem in sediment at this time. Only three pesticides have been detected in sediment at concentrations above their PAL (4,4'-DDE; 4,4'-DDT; and alpha chlordane) once each and during only one ME. In comparison, only trace amounts of one of these pesticides (4,4'-DDT) has been detected in ground-water samples from monitoring wells located upgradient within the landfill (MW09-14D at 0.0075 µg/kg and MW09-20D at 0.071J µg/kg) both of which are screened in the deep zone near the base of the silt unit and neither of which is close to the SED09-01 location where 4,4'-DDT was detected once above the PAL. The site data indicate that ground water from the landfill does not appear to be negatively impacting the sediment. However, continued assessment of the P09-01 and P09-10 locations (outside the constructed wetland area) is appropriate to build a database from which statistical analysis could be performed if necessary to determine if there is unacceptable risk to the environment. The presence of PCB at the P09-01 location is not unexpected, because it is in the vicinity of the PCB soil removal action of Spring 1999 and the concentrations detected at P09-01 (220 µg/kg–l,600 µg/kg) have been below the removal action goal of 2,000 µg/kg. The elevated concentration of PAH detected in the SED09-10 sample from ME 04 is the first PAH exceedance in a sediment sample during the first four monitoring events and suggests the presence of a localized remnant (approximately 2-3 ft bgs) of the historical activity at the site.

Comment 21: Page 21 of 30, para. 2: The truck washing area which drained to the leaching field in Study area 01 was located south of Building 224, and therefore was not included in Study area 1. At the same time, the truck washing area does not seem to have been addressed by the investigation done for Site 02, south of the building. Please clarify.

Response— The sentence has been corrected as follows based on a similar sentence in the SASE (Halliburton NUS, September 1994): ‘‘ The leaching field was installed on the site [Study Area 01] to dispose of surface water runoff and storm water from a truck washing area south of the site at Building 224.” In other words, the truck washing area as shown in Figure 2-3 of the SASE was located between Building 224 and Battalion Boulevard, not south of Building 224.

Comment 22: Page 22 of 30: It does appear that the plume emanating from the PR-58 NIKE site has migrated to the east “beneath a portion of Navy parcel 7.” However, it is still unclear whether or not the PR-58 plume is also responsible for at least some of the CVOC contamination identified at Site 16. Please see general comment, above.

Response— Refer to the response to Comment 4, above.

Comment 23: Page 25 of 30; Section 3.1.7: Characterization and/or pilot testing of remedial technologies on the up-gradient PR-58 NIKE site will likely require enhancements/additions to the LTMP for Sites 02 and 03 and Study areas 01 and 04. Please see general comment, above.

Response— Refer to the response to Comment 5, above.

Comment 24: Page 25 of 30; Section 3.2.1; Site Description: It should be noted that it is as yet unclear to what extent the contamination identified beneath Site 16 extends also to the west, i.e., in the upgradient direction. In addition, it is still unclear whether or not the PR-58 plume and/or contamination beneath Sites 02 and 03 and Study areas 01 and 04 may also responsible for at least some of the CVOC contamination identified at Site 16. The upgradient extent and geometry of the plume(s) beneath Site 16 are in need of additional characterization. Please see general comment, above.

Response— Refer to the response to Comments 4 and 6, above.

Comment 25: Page 26 of 30; RIA 86: The fact that no connecting pipes were identified between an outfall pipe at Allen Harbor and floor drains beneath Building E-107 begs the question as to whether or not the floor drains essentially discharged directly to the subsurface. The fact that several of the other floor drains beneath Building E-107 were not investigated further compounds these concerns. Although present information does not suggest an immediate problem, measures should be taken to address this issue, either as part of the ongoing investigation, the LTMP, or both.

Response— The following statement was in the Draft Five-Year Review Report Section 3.2.1 (now Section 3.2.3.4 Initial Responses): “Some subsurface investigation

outside the building continued into the Phase I and II RI." This sentence has been revised in Section 3.2.3.4 of the Revised Draft document as follows: "Some subsurface investigation outside the building continued into the Phase I and II RI, including the installation of monitoring well cluster MW16-48S/I/D (Figure 9) from which sampling results will not be available until Spring 2003."

RESPONSE TO COMMENTS DATED 15 JANUARY 2003 FROM RHODE ISLAND DEPARTMENT OF ENVIRONMENTAL MANAGEMENT ON THE FIRST FIVE-YEAR REVIEW REPORT OF DECEMBER 2002 FOR FORMER NAVAL CONSTRUCTION BATTALION CENTER (NCBC) DAVISVILLE NORTH KINGSTOWN, RHODE ISLAND

Comment 1: Page 3, Section 1.l, Facility Location and Description, Paragraph 1, Last Sentence -- This sentence states that the Navy transferred the Quonset Point Naval Air Station (NAS) to the Rhode Island Port Authority (RIPA). Please revise this sentence to state that NAS was transferred by General Services Administration to RIPA.

Response— The sentence has been revised in Section 1.1.2 of the Revised Draft version of the document as follows:

> *Adjoining the southern boundary of the Main Center is the decommissioned Naval Air Station (NAS) Quonset Point, which was transferred by the General Services Administration to the Rhode Island Port Authority (RIPA) (currently named the Rhode Island Economic Development Corporation [RIEDC]) and others between 1975 and 1980.*

Comment 2: Page 17, Section 2.2.2, Description of Remedial Objectives, Bullet 2 -- Please note that the constructed wetland serves as protection for the revetment by acting as an energy dissipater. From RIDEM's perspective, the constructed wetland simply changed one form of wetland to another.

Response— The referenced bullet has been revised in Section 2.2.4 (Remedial Actions):

> *Construction of a breakwater structure just east of a majority of the revetment wall, along with construction of a wetland area between the revetment wall and breakwater structure, which together act to trip waves and reduce energy reaching the revetment. Construction of this wetland area along the shoreline of the site also serves as a natural resources/habitat improvement and used material dredged from the entrance channel to Allen Harbor, The progression of wetland development is being monitored over time to determine the feasibility of sustainability. This addressed the RAO for sediment and wetlands.*

Comment 3: Page 21, Section 3.1.1, Site Description and Status (Study Area 01) -- This paragraph states that human health risks associated with this site are below EPA thresholds, implying that no further action is required. Please be advised that RIDEM does not accept the Human health Risk Assessment prepared for this site since the criteria utilized to arrive at the risk values do not meet RIDEM

Remediation Regulation criteria. Based on RIDEM Method 1 Criteria there are residential exceedances for benzo(a)pyrene, chrysene, and lead. If remediation is not possible, then an Environmental Land Use Restriction will be required which prevents residential land use. This needs to be included in the text.

Response— The following was added to Section 3.1.3.5 (Basis for Taking Action) of the Revised Draft document:

> *Also, there were no cancer risks that exceeded EPA s "acceptable risk range '' of 10^{-6} to 10^{-4} for potential future residential receptors. However, RIDEM does not accept this HHRA prepared under CERCLA guidance, because it is RIDEM's position that the criteria utilized to arrive at the risk values do not meet RIDEM Remediation Regulation criteria. Further, it is RIDEM's position that if remediation is not possible, then an Environmental Land-Use Restriction will be required that would prevent residential land use.*

Comment 4: Page 21, Section 3.1.1, Site Description and Status (IR Site 02) -- The discussion, in this section, fails to mention that lead levels remain which are above RIDEM Remediation Regulation Residential Exposure Criteria. If remediation is not possible, then an Environmental Land Use Restriction will be required which prevents residential land use. This needs to be included in the text.

Response— The following was added to Section 3.1.3.5 (Basis for Taking Action) of the Revised Draft document:

> *However, RIDEM has stated that there are lead levels in Site 02 soil remaining above RIDEM Remediation Regulation Residential Exposure Criteria, and if remediation is not possible, then an Environmental Land-Use Restriction will be required which prevents residential land use.*

Comment 5: Page 24, Section 3.1.6, Statement of Protectiveness, Paragraph 1, Sentence 3 -- For Study Area 04 the Navy notes that risks associated with Aroclor-1260 exceeded 10^{-5}. Please note that the Navy elected to use RIDEM Method 1 Direct Exposure Criteria for this site and on that basis none of the confirmatory PCB samples exceeded the 10 ppm residential exposure criteria.

Response— The following was added to Section 3.1.3.5 (Basis for Taking Action) of the Revised Draft document:

> *The Navy also met the RIDEM Method 1 Direct Exposure Criteria for this site, and on that basis, none of the confirmatory soil PCB samples exceeded RIDEM's 10 ppm residential exposure criteria.*

Comment 6: Page 30, Section 3.2.6, Statement of Protectiveness -- "The results of the Phase I RI do not indicate any imminent threats to human health and the environment." Please remove this sentence as we have not yet completed the studies and this seems to imply that we are unlikely to find threats in the future. While it is true that the groundwater is not currently being used there are no restrictions on its use other than those self imposed. The groundwater has been shown to exceed MCLs and RIDEM GA groundwater standards which in and of itself demonstrates that it is not safe for human consumption.

Response— Because there has been risk assessment (Phase I RI) of the available sample results, it is appropriate to state the findings so far. Therefore, the referenced sentence now in Section 3.2.10 (Protectiveness Statement) of the Revised Draft document has been revised for clarity as follows:

> *The results of the Phase I RI do not indicate immediate unacceptable risk exposure to human health or the environment from the Navy's historical use of the site. Therefore, EPA believes that there is no current exposure to the known contamination. Further investigations are planned to determine the nature and extent of the contamination, and to further assess risk to human health and/or the environment from past Navy activity at the site.*

Comment 7: Figures -- Please provide Figures 1 through 5. They were not included in the submission.

Response— A full set of the figures (1 through 10) in the Draft version of the document was overnight shipped to Mr. Gottlieb on 23 January 2003.

Comment 8: Appendix A -- For IR Sites 05, 06, 08, 10, 11, 12, 13, and 14 as well as Study Area 15 please include a statement for each site in the Summary of Risk Assessment section that states that RIDEM Remediation Regulation Method 1 criteria was met. This is necessary to document that RIDEM concurred with the no further action record of decision for each of these sites.

Response— The following was added to the "Summary of Risk Assessment" sections of Appendix A: "RIDEM Remediation Regulation Method 1 criteria was met." The following was added to the "Remedy Selected" sections of Appendix A: "RIDEM concurred with the NFA decision for this site."

RESPONSE TO COMMENTS DATED 11 MARCH 2003 FROM THE U.S. ENVIRONMENTAL PROTECTION AGENCY ON THE REVISED DRAFT FIRST FIVE-YEAR REVIEW REPORT OF FEBRUARY 2003 FOR FORMER NAVAL CONSTRUCTION BATTALION CENTER (NCBC) DAVISVILLE NORTH KINGSTOWN, MODE ISLAND

Comment 1: P. ES-1, ¶ 1 last sentence and p.2 of 61 second to last paragraph; please re-write to state: "The trigger for this first five-year review of the former NCBC Davisville facility is the initiation of the first remedy that left waste in place at concentrations above unrestricted use levels, (i.e., the remedy for Site 09[Allen Harbor Landfill]), and specifically the remedy initiation letter from the Navy dated 30 March 1998." It is to be expected that since the actual due date is on Sunday that the date of this five year review will either be the 28th or the 31st . Please do not change the EPA required due date from the 30th in this document.

Response— The two referenced sentences have been revised as follows: "The trigger for this first five-year review of the former NCBC Davisville facility is the initiation of the first remedy that left waste in place at concentrations above unrestricted use levels, (i.e., the remedy for Site 09[Allen Harbor Landfill]), and specifically the remedy initiation letter from the Navy dated 30 March 1998".

Comment 2: P. ES-l, ¶2, please include "shellfish" in the monitoring requirements.

Response— Shellfish has been added as follows: "…of ground water, sediment, shellfish, and landfill gas..."

Comment 3: P. ES-l, ¶ 2, third to last sentence, please re-write the issue to be …"the quality of ground water discharging from the site to the nearshore."

Response— The sentence has been re-written as follows: "The outstanding issue is the inconclusiveness of the available shoreline piezometer sample data to confirm the quality of ground water discharging from the site to the nearshore."

Comment 4: P. ES-1, ¶ 2, last sentence and other appropriate sections for both OU1 and OU8; Suggest adding additional sentence which states, "In addition, the Navy is considering conducting additional studies, tracer tests, more detailed measurement and mapping of ground water head distribution, and/or other evaluations in the shoreline environment in order to better identify areas where plume discharge has the potential to occur, and to optimize long-term monitoring locations accordingly."

Response— As agreed during the 19 March 2003 BCT Meeting, the referenced sentences were revised as follows: "In addition, the Navy is considering conducting additional studies and/or other evaluations in the shoreline environment in order to better

identify areas where plume discharge has the potential to occur, and to optimize long-term monitoring locations accordingly."

Comment 5: P. ES-1, ¶ 3, second sentence, typo- should monitoring be monitored?

Response— The word 'monitoring' has been changed to 'monitored.'

Comment 6: P. ES-1&2, and elsewhere where appropriate, please change the protectiveness statements for all OUs to defer the decision as discussed during telephone conferences the week of March 3, 2003.

Response— The Site 07 protectiveness statement has been revised to:

> *A protectiveness determination of the remedy at Site 07 cannot be made at this time until further information is obtained. Site 07 LTM plan states that 8 rounds of sampling will be completed prior to determining the protectiveness of the remedy. As of this date, 3 rounds of sampling have been completed. It is estimated that the 8 rounds of sampling will be completed by November 2006, at which time a protectiveness statement will be made. Based on the reviewed data, the Site 07 remedy is expected to be protective of human health and the environment as long as the institutional controls remain in place as implemented through the LUCIP, and in the interim, the exposure pathways that could result in unacceptable risk are being monitored, including consideration of conducting additional studies and/or other evaluations in the shoreline environment in order to better identify, areas where plume discharge has the potential to occur, and to optimize long-term monitoring locations accordingly.*

The Site 09 protectiveness statement has been changed to:

> *A protectiveness determination of the remedy at Site 09 cannot be made at this time until further information is obtained. Site 09 LTM plan states that 8 rounds of sampling will be completed prior to determining the protectiveness of the cap. As of this date 3 rounds of sampling have been completed. It is estimated that the 8 rounds of sampling will be completed by May 2004, at which time a protectiveness statement will be made. The remedy is expected to be protective of human health and the environment as long as the cap and institutional controls remain in place. Remedy of the site has been addressed through stabilization and capping of the waste and contaminated soil, gas vents, covering of most of the shoreline sediment with the constructed wetland, the installation of fencing and warning signs, and the implementation of institutional controls through the LUCIP to prevent exposure to, or ingestion of contaminated ground water and to prevent ground surface activities (e.g., building, motorized vehicles except for LTM activities, digging) that could negatively impact*

the integrity of the landfill cap. The outstanding issue is the inconclusiveness of the available shoreline piezometer sample data to confirm the quality of ground water discharging from the site to the nearshore. Additional piezometers will be installed at each of the 10 locations to attempt to obtain all planned sample aliquots for analysis starting with ME 05 or ME 06. The results of the future complete analyses are hoped to aid in the determination of the representativeness of this sampled area. In addition, the Navy is considering conducting additional studies and/or other evaluations in the shoreline environment in order to better identify, areas where plume discharge has the potential to occur, and to optimize long-term monitoring locations accordingly.

The Study Areas 01 and 04, and Sites 02 and 03 protectiveness statement is as follows: A protectiveness determination of the remedy at these sites can not be made at this time until further information is obtained. The remedy is expected to be implemented in 2007, at which time a protectiveness determination will be made.

The Site 16 protectiveness statement is as follows: A protectiveness determination of the remedy at this site can not be made at this time until further information is obtained. The remedy is expected to be implemented in 2006, at which time a protectiveness determination will be made.

Comment 7: Figure of EPA's 5-yr summary form, last (comment) section on p.1 or other appropriate space in the front of this document, please add the following table:

EPA designation -	
OU1 - Navy designation	Site09
OU2	Site 12
OU3	Sites 5, 8 (soils only)
OU4	Sites 6, 11 & 13
OU5	Sites 0 & 8(groundwater only)
OU6	Site 14
OU7	Study Areas 1 & 4, Sites 2 & 3
OU8	Site 7
OU9	Site 16

Response— The requested information has been added to the bottom of Page 1 of the form as agreed during the 19 March 2003 BCT Meeting:

Navy designation	EPA designation
Site 09	OU1
Site 12	OU2
Sites 05 and 08 (soils only)	OU3
Sites 06, 11, and 13	OU4
Sites 10 and 08 (ground water only)	OU5
Site 14	OU6
Study Areas 01 and 04, and Sites 02 and 03	OU7
Site 07	OU8
Site 16	OU9

Comment 8: Figure of EPA's 5-yr summary form p. 1, please change the review period to December 20, 2002 to March 31, 2003. The review period is defined in the EPA data base as the time it takes to write up the report, not the time the report covers, as the start date is an EPA fiscal trigger. Keeping the other review periods noted in the text to be the 03 to 08 time frame is fine and shouldn't be too confusing since the text is Navy lead and this form is EPA lead.

Response— EPA's Review Period has been changed to "12/20/03 to 03/30/03." It is assumed that this review period would end 30 March 2003 as referenced previously in Comment 1.

Comment 9: Figure of EPA's 5-yr summary form p. 2; *Recommendations and Follow-up Actions* for Site 07, and other appropriate sections: The Navy should also consider adding another line item which indicates, "Consider additional technical issues identified through regulatory reviews of ongoing monitoring data (e.g., EPA comments presented at BCT meeting of December 12, 2002)."

Response— Comment noted, but the Navy disagrees with the addition of the referenced sentence as discussed during the 19 March 2003 BCT Meeting. No related change will be made to the text.

Comment 10: Figure of EPA's 5-yr summary form p. 3; *Recommendations and Follow-up Actions* for Study Areas 01 and 04, and Site 02 and 03: EPA notes that the IGWSP currently in place for these sites may need to be modified depending on the scope and scale of work proposed for the adjoining up-gradient NIKE site. Changes with respect to monitoring frequency, location, or both may be needed. Since specific plans for future work on the NIKE parcel are not known, an acknowledgment of flexibility in this regard would be useful during the development of the FS.

Response— Comment noted.

Comment 11: P. 9 of 61, end of page, please include language that indicates these restrictions will run with the land, such as the language on p.25 in the paragraph just above section 2.2.3.3.

Response— The following has been added as the first bullet: "These environmental land-use restrictions apply to the use of the contaminated site by the Grantee, its successors, and assigns, as delineated on Figure 3 (land-use restriction boundary)."

Comment 12: P.10 of 61, end of section 2.1.3.2 and p.43 end of section 3.1.3.2, please include the following at the end of the paragraph that indicates why the LUCIP inspections are done, "...no variance from the environmental land-use restrictions stated above and there has been no interference with the implemented remedy (i.e.; monitoring system)."

Response— The following was added to the end of the referenced sentence in Section 2.1.3.2: "and that there has been no interference with the implemented remedy (i.e.; monitoring system)." The following was added to the end of the referenced sentence in Section 3.1.3.2: "to document that there has been no variance from the environmental land-use restrictions stated above and there has been no interference with the monitoring system."

Comment 13: Sec. 2.1.4.1 (p14) - Please indicate when the ELUR was recorded in the Town land records. Marilyn Cohen has indicated that the date the deed was recorded was October 17, 2001.

Response— The ELUR has not yet been recorded.

Comment 14: P. 15 of 61, para. 4., last sentence; It would be useful to add the following sentences here: "The Navy will continue to evaluate new data from the shoreline piezometers following each monitoring event with respect to the risk range."

Response— The referenced sentence had been added as requested.

Comment 15: P.16, Question A, please re-write the first sentence to read as is stated on p.19 first sentence under the Technical Assessment Summary section. The double negative on p16 is confusing.

Response— The referenced sentence has been revised as follows: "Based on the data reviewed and site inspections, the remedy is functioning as intended by the ROD."

Comment 16: P. 19, Question C for OU8 and other appropriate areas for OU1; Although EPA does not disagree with the Navy's statement here, a suggestion is offered for the next 5-yr review. It may be useful to conduct an actual topographical survey of the shoreline areas, in conjunction with each 5-year review, with respect to known, fixed features so that it may be determined that the shoreline areas, wetland boundaries, etc. have not shifted significantly due to shoreline erosion or other slow yet inexorable processes. An historical evaluation of the Site 07 property (USGS, 1999) revealed that substantial changes to the shoreline area are probable over timeframes of several years, which may hold serious consequences

to the viability of fixed piezometer locations, for instance. An accurate shoreline survey would be a quick means of evaluating this possibility. There would also be a similar need beyond the breakwater along the revetment on both the north and south ends of the landfill.

Response— Comment noted. There will be no related change to the text. However, in the future, potential significant changes in the position of the site shoreline along the harbor and the entrance channel would be documented by the need to relocate specific piezometers for low-tide stage sampling during monitoring events (previous and potential new piezometer locations [coordinates] are documented by Global Position System [GPS] equipment, and thus, would show significant variation in the position of related shoreline). The Navy would procure new geo- referenced aerial photographs (as they are available) to plot the locations of the piezometers and monitoring wells.

Comment 17: P. 20, the text at the top of the page and the text at the end of paragraph 2, seems to be misplaced. The sentence on the bottom of p. 19 does not flow into the next page. On page 20 the text seems to be discussing OU1 instead of OU8. Perhaps the text from the last sentence on p.19 through the second paragraph on p. 20 should have been erased during proofing? Please clarify.

Response— The referenced sentences related to Site 09 were inadvertently included and have been deleted.

Comment 18: Sec. 2.2.3.2 (p. 24) - Second sentence - is the land transfer still ongoing or has it been completed? In the third sentence after "in the future" insert "due to environmental land use restrictions required by the remedy and."

Response— The referenced clause has been added as requested.

Comment 19: Sec. 2.2.4.1 (p30) - Has the ELUR been recorded in the Town land records yet? If so, include the date of the recording in this section. If it hasn't, it should be identified in the Issues and Recommendations and Follow-up Actions Tables a 2.2.8 and 2.2.9. Implementation of the ICs portion of the remedy does not actually occur until the ICs have been recorded.

Response— Neither the deed nor the ELUR has been recorded. The following has been added to Section 2.2.8: "Deed has not yet been recorded." The following has been added to Section 2.2.9: "Work with the Town and National Park Service to expedite property transfer and recording of the deed and ELUR."

Comment 20: P. 3 1; para. 4; 3rd to last sentence and other appropriate sections; The text should mention the numerous monitoring wells which have been perhaps more than superficially damaged, which may be in need of substantive repairs and/or replacement. The text should list wells in this category in conjunction with a time-frame for corrective action.

Response— The following sentence has been added to the referenced paragraph:

> *...repairs that were completed during October 2002. Additionally, two monitoring wells (MW09-14I and MW09-09D) need to be evaluated regarding potential abandonment and replacement (refer to the last paragraph of Section 2.2.3.1 for related detail). No conditions have been observed…*

Also, the following bullet was added:

- *Assess whether or not to replace damaged monitoring wells and/or consider adding wells to the monitoring network (after evaluation of the ME 08 sample results by 31 December 2004).*

Comment 21: P. 33, 2nd para.; It would appear that the current piezometer network will not be able to provide a sufficient data set so as to allow a statistical evaluation of contaminant trends. The tentative conclusion that much of the piezometer network monitors "harbor water" rather than ground water discharge argues strongly that corrective measures and/or a revised approach are needed in the near-term as has been verbally proposed. Please include the Navy's proposal in the text in this and other appropriate sections,

Response— The following sentence has been added: "...discharge to this area. The Navy plans to add additional piezometers to each of these 10 locations. Additionally, although..."

Comment 22: Page 33 of 61, first partial sentence: Typo? Change Table 24 to Table 4.

Response— This inadvertent typo has been corrected to Table 1

Comment 23: Page 33 of 61, end of second paragraph: It is stated that the dissolved metals were higher in the piezometers than just upgradient in the landfill, and that this was additional evidence of recycled harbor water from the previous high stage. The latter statement should be eliminated or supported by harbor dissolved metals data. It could just as easily be that the seawater is dissolving metals from the soil matrix. This type of evaluation should be done in the upcoming data evaluation report.

Response— The Navy will consider the collection of a sample of the harbor water for analysis of the same metals as the piezometer water samples are analyzed. So far, the available piezometer water sample results do not support that these metals are being dissolved from the stainless steel piezometers; i.e., the concentrations have not consistently increased with time.

The related sentence has been revised as follows: "~~This further supports~~ The possibility that much of the water collected from the piezometers may be recycled

harbor water from the previous high tide stage will be assessed after collection of 8 monitoring events of data."

Comment 24: Page 34 of 61, first sentence: This sentence states that the small number of compounds detected and inconsistent detections do not support a protectiveness problem. This paragraph goes on to describe the exceedances of a few PALs; however, the numerous exceedances by PAHs in ME#4 (Table 4) are not mentioned. The data could be interpreted that the concentrations in sediment currently exceed PALs, but additional data are needed to determine whether there is a protectiveness problem. The PAH exceedances should be included here in the text. In addition, there does appear to be some level of consistency in sediment sample detection. For example, COC exceedances were recorded the SED09-01 location at each of the 4 monitoring events.

Response— Each of the issues noted by the commenter have been previously stated in the text of the Revised Draft document. Also, PAH had been previously defined in the text as 'polycyclic aromatic hydrocarbons.' As agreed during the 19 March 2003, the following revision was made (additions are underlined): "...detected at P09-01 (220 µg/kg–1,600 µg/kg) except for one sample have been below the removal action goal of 1,000 µg/kg. The elevated concentration of 8 PAH detected in the SED09-10 sample from ME 04..."

Comment 25: Page 34 of 6l, 4th sentence: This sentence states that the site data indicate that ground water from the landfill does not appear to be negatively impacting the sediment. The basis for this statement should be described, presumably by comparing the presence/concentrations of sediment contaminants with groundwater contaminants, as soon as the data is available to show that the sediment sampling locations are directly downgradient (within the flowplath) of the groundwater sampling locations. This statement should be removed from this and other appropriate sections.

Response— The referenced sentence will remain as is because it is based on the available site samples results and is qualified with the words 'does not appear to be.' However, the following sentence has been revised with additional words (underlined) as agreed during the 19 March 2003 BCT Meeting: "However, continued assessment of the P09-01 and P09-10 locations (outside the constructed wetland area) and ground-water flowpaths are appropriate to build a database from which statistical analysis could be performed if necessary to determine if there is unacceptable risk to the environment."

Comment 26: P. 34 and 35, the ESD required a 1 ppm cleanup level in the sediments, please change the 3 places where it states 2 ppm to 1 ppm. The result of this change is that the conclusion must also change. Perhaps a statement such as, " slightly above the cleanup level" would be appropriate?

Response— The referenced sentence has been revised as follows: "…detected at P09-01 (220 µg/kg–l,600 µg/kg) except for one sample have been below the removal action goal of 1,000 µg/kg."

Comment 27: Sec. 2.2.7 (p 35) and Secs. 2.2.8 & 2.2.9 - If the property has not yet been transferred the ELUR not recorded the answer to this question should state how the Navy is maintaining the use restrictions at the property (in addition to maintaining security) until the property transfer can be completed and the ELUR recorded. This should also be identified in the Issues and Recommendations and Follow-up Actions Tables.

Response— The Town of North Kingstown has not yet received the deed; therefore, neither the deed nor the ELUR have been recorded. The following has been added to Section 2.2.8: "Deed has not yet been recorded." The following has been added to Section 2.2.9: "Work with the Town and National Park Service to expedite property transfer and recording of the deed and ELUR."

Comment 28: P. 44, the last paragraph seems to be a more appropriate wording than the one preceding it.

Response— The first paragraph related to Site 03 in Section 3.1.3.4 has been deleted.

Comment 29: P. 46, 2nd paragraph, 6th sentence, if the Navy also found acceptable risk under a residential risk assessment, the last part of the sentence can be stricken. Remove "...under the planned future use of the site" since an industrial future use is envisioned under the MARAD transfer and this sentence as written doesn't indicate unrestricted use.

Response— The referenced sentence was changed as requested: "The result was that there are no concerns for adverse effects from lead in soil at Site 02 ~~under the planned future use of the site.~~

Comment 30: P. 47 & 61, the owner of the property is the Navy. RIEDC is the lessee. Please change the sentence to read that the "leasee is aware of the contamination".

Response— The related sentences in Sections 3.1.6.4 and 3.2.10 have been revised as follows: "The leasee is aware..."

Comment 31: P.61, § 3.2.10, 7th sentence, change "EPA" to "Navy" since the Navy is the author of the document.

Response— As agreed during the 19 March 2003 BCT Meeting, the referenced sentence was revised as follows: "Therefore, ~~EPA believes that~~ there is no current exposure to the known contamination."

Comment 32: Appendix, Table D-1, p.2 for Site 7, please re-evaluate the Rivers and Harbors Act for NCBC Davisville rather than for Newport. The Allen Harbor is a public marina and is not use or access restricted.

Response— The reference to Newport was an inadvertent error and has been deleted.

Comment 33: Table D-1 for Site 07, page 3 - Under federal endangered species act remove citation to least tern (state-listed not federally listed but add citation for several federally listed sea turtles that are found in Narragansett Bay - The federally endangered loggerhead turtle (*Caretta caretta*) and federally threatened Kemp's ridley turtle (*Lepidochelys kempii*) occur in the waters of Narragansett Bay. Appropriate agencies will be consulted to find ways to minimize adverse effects to the listed species from the removal and restoration remedy. Also remove citation to the Florida grasshopper sparrow since the federally-listed subspecies does not occur in the Northeast.

Response— The sea turtles have been added and the Florida grasshopper sparrow has been deleted.

Comment 34: Table D-1 for Site 07, page 4 - Under the state endangered species act add the citation about for the two state-listed sea turtles.

Response— The sea turtles have been added.

Comment 35: Table D-1 for Site 09 for state water quality regulations - need to identify specifically how the criteria were amended an how the changes were incorporated into the remedy.

Response— This comment was resolved during the 19 March 2003 BCT Meeting and requires no change to the table. As previously stated in the Table D-1, the last revision of the regulation was 8 November 2000, prior to finalization of the LTM QAPP dated November 2001. Therefore, the values used did not change after finalization of the QAPP and no change is required.

Comment 36: Table D-2 for Site 09, page 2 - Under federal endangered species act remove citation to least tern (state-listed not federally listed but add citation for several federally listed sea turtles that are found in Narragansett Bay -The federally endangered loggerhead turtle (*Caretta caretta*) and federally threatened Kemp's ridley turtle (*Lepidochelys kempii*) occur in the waters of Narragansett Bay. Appropriate agencies will be consulted to find ways to minimize adverse effects to the listed species from the removal and restoration remedy. Also remove citation to the Florida grasshopper sparrow since the federally-listed subspecies does not occur in the Northeast.

Response— The sea turtles have been added and the Florida grasshopper sparrow has been deleted.

Comment 37: Table D-2 for Site 09, page 2 - Under the state endangered species act add the citation about for the two state-listed sea turtles.

Response— The sea turtles have been added.

Comment 38: Table D-3 for Site 09, page 2 - The status of TSCA as an ARAR is applicable and the EPA Guidance document is To be Considered.

Response— The status of TSCA as an ARAR has been corrected to "Applicable" and the status of the EPA Guidance document has been shown as "To Be Considered."

Comment 39: Table H-9.1 and H-9.2 should have a footnote indicating that the risks of individual chemicals are those for trigger chemical concentrations in Table H-3.

Response— The following note has been added to Tables H-9.1 and H-9.2: "Chemicals listed are those with trigger concentrations previously listed in Table H-3."

Comment 40: Table H-3 should have a footnote indicating that the EPCs represent risk-based trigger levels (rather than average concentrations in surface water at site 07).

Response— The column heading "EPC" has been replaced with "Risk-Based Trigger Value."

Comment 41: Add Section

3.3 West Davisville Aircraft Counterweight Discovery and Identification
Include the history of the finding and the plan for additional investigation as written on p.3 of the 49th and 50th RAB meeting notes, as appropriate. (I do not have BCT notes for BCT meetings between Feb 2002 and Dec. 2002.) These meeting notes should be forwarded as soon as possible and may contain information that should be included in the 5-year review. Please include in new section 3.3, a description of the final disposition of the counterweights that were found (copy of chain of custody forms/ultimate disposal information). Also to be included is a description of the EBS program and the results of the NRC license review for Davisville-NCBC. This new section 3.3 should be organized as the sections 3.1-CED area and 3.2-site 16 were, such as:

3.3.1 Introduction, Refer to Section 1.1 for description of the purpose do the five-year review.

3.3.2 Site Chronology

Prior to the end of WWII - Quonset Hut Manufacturing

1970's through 1990- Navy Tenant - Defense Reutilization and Marketing Office, Defense Logistics Agency

EBS Program - Review item 31-DRMO Scrapyard evaluation of data in 1997- 1998 with NFA in 1998 {provide information from the appropriate EBS phase II document}

April 1999 sold to RIEDC without environmental restrictions

May 2002 counterweight discovery, removal, disposal

August 2002 Investigation Work Plan Submitted

November/December (?) 2002 clearing and grubbing of site in preparation for Spring 2003 investigation field work

3.3.3 Background

3.3.3.1 Physical Characteristics (appropriate information from EBS program documentation)

3.3.3.2 Land and Resource Use (appropriate information from EBS program documentation)

3.3.3.3 History of Contamination - May 2, 2002, the Navy received a telephone call from the RIEDC about an object discovered by Narragansett Electric during a power pole installation. The object was labeled as "Uranium-high salvage value". The electric ...{include text from RAB minutes as appropriate}

3.3.3.4 Initial Response {include text from RAB minutes and include disposal information}

3.3.3.5 Basis for Taking Action, Uranium is a hazardous substance as defined under CERCLA §101 (14) which refers to any hazardous pollutant listed in §112 of the Clean Air Act, 42 USC 7412. Therefore, on May 8, 2002, EPA requested the Navy investigate the nature and extent of contamination in both the soils and groundwater. The Navy will be performing investigative field work in the spring of 2003.

3.3.4 Remedial Actions {use std language in the text of the revised 5 year review document for site 16 for this and sections 3.3.5 & 3.3.6.1,2&3}

3.3.6.4 Data Review no data has been gathered at this site as of this 5-year review.

3.3.6.5 Site Inspections no inspections have occurred since this site is still under investigation

3.3.6.6, 7, 8 {use std language in text for site 16}

3.3.9 Recommendations and Follow-up Actions, Complete the investigation and make decision whether to create another study area under the IRP in accordance with FFA §31.2.

3.3.10 Protectiveness Statement A protectiveness determination cannot be made at this time until further information is obtained. Further information will be obtained by completing the investigative field work in Spring 2003. A protectiveness determination will be made once the investigation is completed.

3.3.11 Next Review {include the std language from site 16.}

Response— The Navy has added the West Davisville Aircraft Counterweight Discovery and Identification Area as Chapter 4 formatted using the same section titles as used in Chapter 3. For content, please refer to the new Chapter 4 in the Final version of the document.

RESPONSE TO COMMENTS DATED 25 MARCH 2003 FROM THE U.S. ENVIRONMENTAL PROTECTION AGENCY ON THE REVISED DRAFT FIRST FIVE-YEAR REVIEW REPORT OF FEBRUARY 2003 FOR FORMER NAVAL CONSTRUCTION BATTALION CENTER (NCBC) DAVISVILLE NORTH KINGSTOWN, RHODE ISLAND

Comment 1: Regarding the Action-specific Table text for TSCA change D-3, p2 for Site 9 to - "Applicable standards for the PCB removal under the ESD and for any PCB remaining on site above cleanup standards."

Response— The requested revision has been made to page 2 of Table D-3.

Comment 2: D-3 p3 Site 9: Regarding the state water quality regs be specific how changes to classifications and criteria have specifically effected the remedy. Change the mod/impact to read, no further discharges are planned, no impact to remedy.

Response— This comment was discussed with EPA on 26 March 2003 and the agreed upon revised statement has been added to page 3 of Table D-3 as follows: "The ongoing storm water discharges are in compliance with the regulation. There is no impact to the remedy."

Comment 3: D-3 p3 Site 9: Regarding the state water pollution control reg listing: Remove the text discussing permits and application procedures. Change the mod/impact to read--no further discharges are planned, no impact to remedy.

Response— This comment was discussed with EPA on 26 March 2003 and the agreed upon revised statement has been added to page 3 of Table D-3 as follows: "The ongoing storm water discharges are in compliance with the regulation. There is no impact to the remedy."

RESPONSE TO COMMENTS DATED 26 MARCH 2003 FROM THE U.S. ENVIRONMENTAL PROTECTION AGENCY ON THE REVISED DRAFT FIRST FIVE-YEAR REVIEW REPORT OF FEBRUARY 2003 FOR FORMER NAVAL CONSTRUCTION BATTALION CENTER (NCBC) DAVISVILLE NORTH KINGSTOWN, RHODE ISLAND

Comment 1: 2.1.4.1 Remedy Implementation: During August 2001, the LTMP was initiated with ME 01. LUCIP inspections were initiated on 23 May 2001. The deed, without (strikethrough: with) the (strikethrough: environmental restrictions) ELUR, was recorded on 17 October 2001. Since the issues table notes that the ELUR has not yet been recorded, the text should correspond. The way it is currently worded is a bit confusing.

Response— Based on discussion with EPA, Section 2.1.4.1 has been revised as follows: "During August 2001, the LTMP was initiated with ME 01. LUCIP inspections were initiated on 23 May 2001. The deed, without the ELUR, was recorded on 17 October 2001."

Comment 2: 2.1.8 Issues: In the table under "The ELUR has not yet been recorded" mark the last column (Effect Future Protectiveness, since without the ELUR there is a question as to the adherence to the ROD requirements) "Y" rather than "N."

Response— The "N" has been changed to a "Y", for the "Affects Future Protectiveness".

Comment 3: 2.1.9 Recommendations and Follow-Up Actions: Same comment as #2 for "Recording of ELUR" - mark the last column "Y" rather than "N."(Effect Future Protectiveness)

Response— The "N" has been changed to a "Y" for the "Affects Future Protectiveness"

Comment 4: 2.2.8 Issues - Same change as comment 2.

Response— The "N" has been changed to a "Y" for the "Affects Future Protectiveness".

Comment 5: 2.2.9 Recommendations and Follow-Up Actions - Same change as comment 3.

Response— The "N" has been changed to a "Y" for the "Affects Future Protectiveness".

Comment 6: 3.2.10 - in the second sentence, a space may be needed: "A protectiveness determination (strikethrough: of the) of the remedy ..." there were also several other areas where edits for spacing may be needed.

Response— The file reviewed by the commenter was set to 'track changes' with redlining and strike-out. If after accepting the changes, spaces are needed, the editor will make the necessary corrections for the final document.

Comment 7: 4.1.3.3 - Its unclear from this text that the area meets residential standards since it implies it was only screened to industrial standards. If so, assuming residential risk is from CERCLA contaminants and not TPH, a CERCLA response action would be required (limited action - IC's).

The results of the limited removal action by Foster Wheeler need to be expanded upon. Were there any sample results that were above residential criteria? Please call to discuss.

Response— After review of the related Foster Wheeler report and discussion with EPA, the following revision of Section 4.1.3.3 was agreed to: The subject area is located within a portion of the DRMO Scrapyard (EBS Review Item No. 31) and was formerly used by the Defense Reutilization and Marketing Office (DRMO), which received material from the Department of Defense for reuse. Scrap items including old refrigerators, metal cabinets, air conditioners, and car parts were stored through 1992. In addition, this area received hazardous materials/hazardous waste until the mid-1980s. According to NCBC Davisville personnel, there are no known releases associated with this subparcel. Therefore, sampling and analysis of surface and subsurface soil and the advancement of three soil borings were conducted as part of the Phase II EBS investigation of NCBC Davisville (EA 1998d). The analytical program included TCL SVOC, pesticides, PCB, TPH, and TAL metals (subsurface soil samples were also analyzed for TCL VOC). The detected concentrations in surface and subsurface soil samples were below screening criteria, except for three locations where the combined TPH values exceeded 300 mg/kg, a RIDEM criteria. Therefore, additional sampling of surface soil was performed under the Phase II EBS follow-On Investigation (EA 1998e). The samples were analyzed for TPH, TCL VOC, and TCL SVOC. VOC were not detected. TPH exceeded RIDEM's Class GA Leachability criterion (500 mg/kg) in samples EBS-31-RSS-11 and -13. SVOC exceeded RIDEM's criteria only in one sample (EBS-31-RSS-06). SVOC concentrations in the other samples were generally low or not detected. Reinspection of the area did not show evidence of stained soil. It was assumed that the presence of deteriorated pavement accounted for the low concentrations of TPH and SVOC detected in the soil samples. Even so, it was recommended that limited soil removal be conducted at those three sample locations (EBS-31-RSS-06, EBS-31-RSS-11, and EBS-31-RSS-13). The limited soil removal action and confirmatory sampling was completed by FWENC (FWENC 1998b). Based on the low results, EBS Review Item No. 31 was recommended for NFA and concurrence was received from EPA and RIDEM in January 1998.