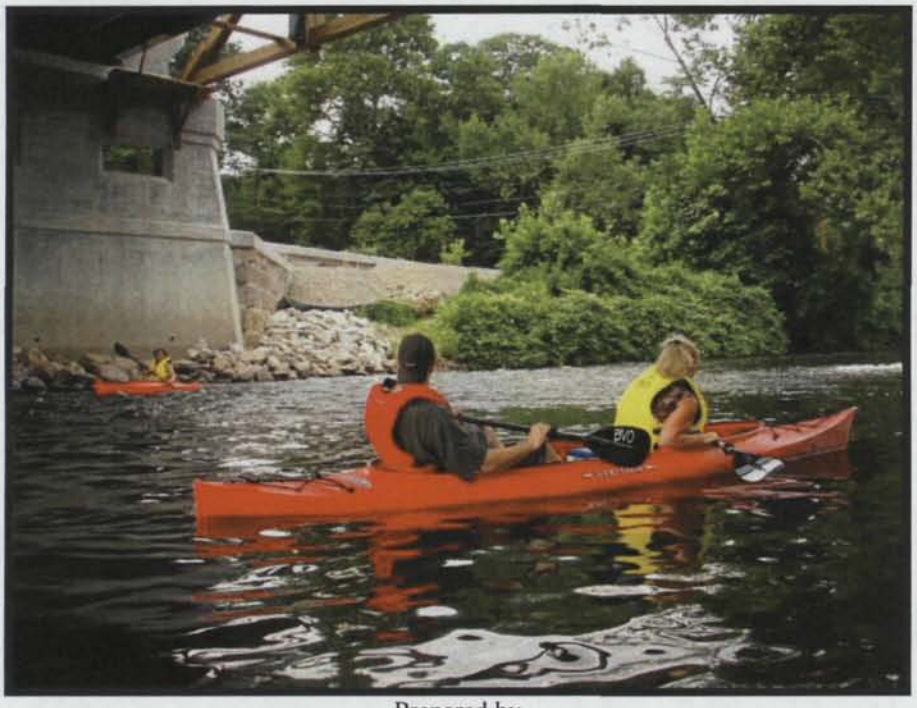
US Army Corps of Engineers®
New England District

EPA Region 1, New England

Second Five-Year Review Report
Peterson/Puritan, Inc. Superfund Site
Towns of Cumberland and Lincoln
Providence County, Rhode Island
September 2007



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Approved by:

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Restoration

Date: 9-28-07

EXECUTIVE SUMMARY

A five-year review was performed for the Peterson/Puritan, Inc. Superfund Site in Cumberland and Lincoln, Rhode Island (Site) as required by the Comprehensive Environmental Response, Compensation, and Liability Act. Implementation of the remedial actions at Operable Unit 1 (OU-1) in August 1996 initiated the five-year review process for the Site. The trigger for this second five-year was completion of the first five-year review in September 2002. The purpose of this second five-year review is to assess whether the remedy selected for OU-1 of the Site remains protective of human health and the environment. In addition, this report also documents the progress undertaken for the remaining areas of the Site beyond OU-1. This second five-year review covers the period from September 2002 to September 2007.

The Site encompasses over two miles of mixed industrial/residential property in the towns of Cumberland and Lincoln, Rhode Island. The Site is situated in the north-central portion of Rhode Island along the Blackstone River and includes a portion of the Blackstone River Valley National Heritage Corridor between the Ashton Dam to the north, and the Pratt Dam to the south along the river's course. To address the various environmental issues efficiently, the Site is broken into sub-areas defined as Operable Units (OUs). There are currently two OUs: OU-1 (Primary Source Area), OU-2 (J. M. Mills Landfill) and there remains a third area under consideration known as the "potential" OU-3 area (Mackland Farm/Kelly House). The Site also includes the Lincoln Quinnville Wellfield and the Cumberland Lenox Street municipal well. These wells were used by the towns of Lincoln and Cumberland as a municipal water supply until 1979 when they were closed by the Rhode Island Department of Health due to the presence of chlorinated volatile organic contaminants found in the water. EPA included the Site on the Superfund National Priorities List on September 8, 1983.

OU-1

The OU-1 remedy is comprised of two components; enhanced source control, and management of migration. The 1993 Record of Decision apportioned the remedy to two areas, CCL Custom Manufacturing (CCL) and Pacific Anchor Chemical (PAC) remediation areas.

EPA has determined as part of this five-year review that the remedy for OU-1 currently protects human health and the environment in the short term because alternative water supplies are available to meet current demand. The remedy, however, cannot be deemed protective in the long term until follow-up actions are taken. These follow-up actions include further definition of the occurrence of contaminants in bedrock, the fate and transport of contaminants, and the completion of institutional controls throughout OU-1 as identified in the first five-year review. Institutional controls are implemented at a portion of the properties located within the PAC remediation area and steps are being taken to implement institutional controls at the remainder of OU-1.

OU-2 and Potential OU-3

At OU-2, an investigation into the nature and extent of contamination at the J. M. Mills Landfill and its surroundings is currently underway. Until this information becomes available, the protectiveness determination for OU-2 cannot be made at this time. Lastly, the potential OU-3 remains in the planning stage. For the Ashton Mill property, located on the Cumberland side of the Blackstone River, EPA no longer considers this part of the Site.

FIVE-YEAR REVIEW SUMMARY FORM

SITE IDENTIFICATION

Site name: Peterson/Puritan Inc. Superfund Site

EPA ID: RID055176283, Site ID# 0101247

Region: 1	State: RI	City/County: Cumberland and Lincoln, Providence County

SITE STATUS

NPL status: **X** Final Deleted Other (specify)

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

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

Has site been put into reuse? X YES (Partial) NO

REVIEW STATUS

Lead agency: **X** USEPA State Tribe Other Federal Agency _____

Author name: David J. Newton, USEPA (Lead),
Adam Burnett , U.S. Army Corps of Engineers (Support)

Author title: Remedial Project Manager (Lead)	**Author affiliation:** U.S. Environmental Protection Agency, and U.S. Army Corps of Engineers New England District

Review period:** 11 / 16 / 2006 to 09 / 30 / 2007

Date(s) of site inspection: 6 / 26 2007 and 6 / 28 / 2007

Type of review:

X	Post-SARA	____	Pre-SARA	____	NPL-Removal only
____	Non-NPL Remedial Action Site	____	Regional Discretion	____	NPL State/Tribe-lead

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

Triggering action:

____	Actual RA Onsite Construction at OU-#____	Actual RA Start at OU#	____
____	Construction Completion	Previous Five-Year Review Report	X
____	Other (specify)		

Triggering action date *(from WasteLAN)*: September 26, 2002

Due date (five years after triggering action date): September 26, 2007

* ["OU" refers to operable unit.]

FIVE-YEAR REVIEW SUMMARY FORM, CONTINUED

Issues:

- Arsenic in groundwater throughout the PAC remediation area remains above drinking water standard.
- BTEX concentrations from off-site source continue to impact PAC remediation area.
- CVOC's remain above drinking water standards at the CCL remediation area and will not meet remediation goals as described in the ROD.
- Institutional Controls are not fully implemented; access agreements are not documented.
- The extraction well network at the CCL downgradient area is not providing efficient removal of contaminants.
- Vapor intrusion to occupied structures is a potential concern near the source area.
- Process monitoring has not demonstrated adequate capture of contaminants.
- Periodic monitoring data reports should be upgraded to meet long term monitoring remedy optimization strategies
- The quality assurance project plan (QAPP) is out of date.
- RI/FS is not yet complete, and signage and fencing to limit exposure has not been maintained at OU-2.
- No ICs in place at "potential" OU-3, the Mackland Farm/Kelly House parcel(s).
- The Quinnville wellheads are not properly secured and are vulnerable to vandalism and contamination.

Recommendations and Follow-up Actions:

- Apply state-of-the-art modeling techniques to predict the fate and transport of arsenic.
- Continue periodic monitoring of BTEX-impacted area. Apply long-term monitoring optimization approach.
- Characterize the concentration and extent of CVOC's in groundwater; define groundwater flow patterns and mass fluxes to valley fill from bedrock; conduct pore water study to assess impacts to the river.
- Implement and maintain all IC agreements on all appropriate parcels, secure access (OU-1 and OU-2).
- Assess alternative technologies for removing CVOCs to reduce cleanup time. Apply borehole flow meter techniques to determine sources of water and aquifer properties at extraction wells. Apply quantitative modeling techniques to evaluate mass removal.
- Apply models to assess the potential threat of vapor migration of site-related contaminants into occupied structures. Perform a vapor intrusion pathway assessment, if needed.
- Repeat the gas vent testing at a high ambient temperature in accordance with the substantive requirements.
- Analyses of monitoring data must account for extended cleanup timeframe and support of optimized long-term monitoring and remedial strategies.
- Update QAPP(s) to account for procedural changes and validity of analytical reporting limits (every 5 years)
- Complete RI/FS at OU-2.
- Agency collaboration to consider options for protectiveness for potential OU-3.
- Work with Lincoln Water Commission to approve a plan to secure the wellheads at Quinnville.

Protectiveness Statement(s)

OU-1

EPA has determined as part of this five-year review that the remedy for OU-1 currently protects human health and the environment in the short term because alternative water supplies are available to meet current demand. The remedy, however, cannot be deemed protective in the long term until follow-up actions are taken. These follow-up actions include further definition of the occurrence of contaminants in bedrock, the fate and transport of contaminants, and the completion of institutional controls throughout OU-1 as identified in the first five-year review. Institutional controls are implemented at a portion of the properties located within the PAC Remediation Area and steps are being taken to implement institutional controls at the remainder of OU-1.

OU-2 and Potential OU-3

At OU-2, an investigation into the nature and extent of contamination at the J. M. Mills Landfill and its surroundings is currently underway. Until this information becomes available, the protectiveness determination for OU-2 cannot be made at this time. Lastly, the potential OU-3 remains in the planning stage. For the Ashton Mill property, located on the Cumberland side of the Blackstone River, EPA no longer considers this part of the Site.

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LIST OF ABBREVIATIONS AND ACRONYMS

µg/L	micrograms per Liter
ARARs	Applicable or Relevant and Appropriate Requirements
BERA	Baseline Ecosystem Risk Assessment
BTEX	Benzene, Toluene, Ethylbenzene, and Xylene
CAS	Carbon Adsorption System
CCL	CCL Custom Manufacturing, Inc.
CERCLA	Comprehensive Environmental Response, Compensation, and Liability
CFR	Code of Federal Regulations
COCs	Contaminants of Concern
CVOC	Chlorinated Organic Compound
CWA	Clean Water Act
DCA	Dichloroethane
DCE	Dichloroethene
EPA	Environmental Protection Agency
FYR	Five Year Review
GAC	Granular Activated Carbon
GWTS	Groundwater Treatment System
HHRA	Human Health Risk Assessment
IC	Institutional Control
IFR	Industrial Factory Rentals
JGWMP	Joint Groundwater Monitoring Program
KIK	KIK Custom Products (Formerly CCL Custom Manufacturing, Inc.)
MCL	Federal Maximum Contaminant Levels
mg/kg	milligrams per kilogram
MNA	Monitored Natural Attenuation
MTBE	methyl-tert butylether
NBC	Narragansett Bay Commission Total Toxic Organics
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NPDES	National Pollution Discharge Elimination System
NPL	National Priorities List
NRCS	National Resources Conservation Services
O&M	Operations and Maintenance
OSWER	Office of Solid Waste and Emergency Response
PAC	Pacific Anchor Chemical Company
PAH	Polycyclic Aromatic Hydrocarbon
PAL	Project Action Limit
PCB	Poly-Chlorinated Biphenyl
PID	Photo-Ionization Divice
POTW	Publicly Owned Treatment Works
ppmv	parts per million by volume
PRPs	Potentially Responsible Parties
RA	Remedial Action
RCRA	Resource Conservation and Recovery Act
RD/RA	Remedial Action/Remedial Design
RI/FS	Remedial Investigation/Feasibility Study
RIDEM	Rhode Island Department of Environmental Management
RIDOT	Rhode Island Department of Transportation
ROD	Record of Decision
SARA	Superfund Amendments and Reauthorization Act
SDWA	Safe Drinking Water Act
SOW	Scope of Work
SQT	Sediment Quality Triad

SVE	Soil Vapor Extraction
TBC	To be considered
TCA	Trichloroethane
TCE	Trichloroethene
TI	Technical Impractibility
TMDL	Total and Maximum Daily Load
TSDF	Temporary Storage and Disposal Facilities
TTO	Total Toxic Organics
USACE	United States Army Corps of Engineers
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
UST	Underground Storage Tank
VC	Vinyl Chloride
VE	Vapor Extraction
VOC	Volatile Organic Compound
WQR	Water Quality Regulations

1.0 INTRODUCTION

Under an Inter-Agency Agreement and in accordance with an approved work plan dated May 2007, EPA, Region 1, New England (USEPA-NE) directed the U.S. Army Corps of Engineers, North Atlantic Division Office (USACE-NAE) to support EPA's efforts in preparing this second Five-Year Review of the Peterson/Puritan, Inc. Superfund Site in Cumberland and Lincoln, RI (the Site). This review includes a progress update concerning relevant on-going environmental work throughout the whole Site and predominantly a review of the Settling Defendants' remedial actions undertaken at Operable Unit 1 (OU-1) including detailed treatment system evaluation, trend analyses, and data summary reports in support of the review. EPA and USACE undertook various measures to inform the public and community stakeholders of the five-year review process. EPA also continued to identify and support emerging community needs and issues, and has supported stakeholder initiatives concerning reuse throughout the Site. This report documents the results of these efforts as it relates to the five-year review.

1.1 Regulatory Background

The United States Environmental Protection Agency (EPA) must implement five-year reviews consistent with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). This is the second five-year review for the Site. Topographic and aerial maps of the Site are presented in Figures 1 and 2 in Appendix A. This review is required by statute because the selected remedies for site contaminants result in contaminants remaining at concentrations exceeding those associated with unrestricted exposure to site media. The trigger for this statutory review was completion of the first Five-Year Review in September 2002.

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.*

The NCP part 300.430(f)(4)(ii) of the Code of Federal Regulations (CFR) states:

> *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 the initiation of the selected remedial action.*

1.2 Purpose of the Five Year Review

The purpose of this five-year review is to determine whether the remedy for OU-1 (see Figure 3, Appendix A for a detailed map of OU-1) of the Site is functioning as intended and is protective of human health and the environment. This report also documents the progress undertaken for the remaining areas of the Site beyond OU-1, including Operable Unit 2 (OU-2) (see Figure 4, Appendix

A for a detailed map of OU-2). Specifically, the report addresses the following three questions stated in EPA's Five-Year Review Guidance Document (USEPA 2001):

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

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

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

The findings and conclusions of this review are documented in this report. The report also identifies issues found during the five-year review process and offers recommendations to address such issues.

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2.0 SITE CHRONOLOGY

The chronology of the Site, including all significant Site events and dates is included in Table 1.

Table 1. Chronology of Site Events.

Date	Event
1950s	Blackstone River valley was first developed as a municipal water supply source for the town of Cumberland along its east bank (Martin Street Well).
1957	Town of Lincoln installed the first of three municipal wells on a parcel in Quinnville, next to the west bank of the Blackstone River (the "Quinnville Well field").
1959	The former Peterson/Puritan plant was constructed as a packager of aerosol consumer products on Martin Street in Cumberland.
1964	Town of Cumberland installed Lenox Street Well, one mile south of Martin Street for additional water service.
1967	Martin Street Well was closed by municipality due to iron and manganese fouling.
1970—1975	Town of Lincoln added two more wells at the Quinnville Well field to service community.
1974	Peterson/Puritan experienced a spill of approximately 6,200 gallons of solvent from a rail car during a delivery to the plant's tank farm.
1976	The Peterson/Puritan facility experienced a fire and explosion, which required the plant to undergo new construction and modifications.
1979	During routine statewide sampling of municipal wells, Rhode Island Department of Health discovered chlorinated volatile organic compounds exceeding drinking water standards in Lincoln at the Quinnville well field and in Cumberland at the Lenox Street well.
1979—1981	Quinnville wells were periodically used when contaminant concentrations declined below EPA drinking water standards.
1980—1984	A series of initial investigative studies into the source of the contamination was conducted by EPA and private parties. Lincoln initiates a search for a new water supply, constructs two new wells in the Blackstone Valley aquifer, and later completes a connection to the City of Providence water system. Cumberland offsets its loss of water service at the Lenox street well though other Town-owned water resources.
02/21/1981	VOCs were detected in supply well at the Okonite parcel; well was closed.
12/30/1982	Site was proposed for National Priorities List (NPL).
1982—1987	EPA negotiated with Potentially Responsible Party to conduct and finance the Remedial Investigation/Feasibility Study (RI/FS).
1983—1992	Peterson/Puritan (Malcolm Pirnie) installed recovery well RW-1 on O'Toole property downgradient of tank farm and began pumping (Pre-NPL response).
09/08/1983	Final listing of Site on NPL.
05/16/1986	EPA fund-lead Site-wide RI/FS commenced along a 2-mile segment of the river between the Ashton and Pratt dams (entire Site as defined by NPL listing).
05/29/1987	Administrative Order by Consent (AOC) was signed with EPA, and the Potentially Responsible Party (PRP) took the over Site-wide RI/FS.
1990	Due to the expansive study area and the number of identified areas of concern, USEPA administratively divided the Site into Operable Units. Dexter Quarry is removed from the Site's listing description and is delegated to the State for appropriate response actions. Pacific Anchor facility (PAC Remediation Area) is added to the OU-1 investigation. Other portions of the Site, including J. M. Mills Landfill and vicinity to the south, and Mackland Farm (a.k.a. Kelly House property) to the north are identified for potential future response action areas. OU-1 (area encompassed by the industrial park and the Quinnville Wellfield) is earmarked for continued RI/FS, leading to OU-1 Record of Decision.
1991	First Removal Action taken at J. M. Mills Landfill; landfill is secured with a fence (OU-2, as designated).
06/1993	Revised OU-1 Final Remedial Investigation was submitted to EPA.
06/1993	OU-1 Feasibility Study was submitted to EPA.
09/30/1993	Record of Decision for OU-1 was signed.
04/22/1994—07/25/1995	US EPA conducted negotiations for Remedial Design/Remedial Action for OU-1.
04/14/1995	Consent Decree is signed by Settling Defendants. The RD/RA Statement of Work attached to the Consent Decree defined the response activities and deliverable obligations that the Settling Defendants were obligated to perform. The activities described in the SOW were based upon the EPA ROD for OU-1.
06/22/94 – 08/17/94	US EPA negotiated Prospective Purchaser Agreement with owners of Hope Global parcel (agreement includes access and ICs for CCL remedial construction work).
04/15/1995—10/20/1995	CCL Remediation Area Remedial Design Work Plans, Pre-design Investigation Work Plan was developed and approved (OU-1).
07/01/1995—07/03/1995	CCL Remediation Area Tank Farm manhole and catch basin excavations conducted. SVE wells installed.
07/25/1995	Consent Decree was lodged by the Court.
10/02/1995	CCL Remediation Area Initial Remedial Steps (IRS) award of construction contract, and mobilization.
07/01/1995—10/24/1995	Settling Defendants developed a Joint Groundwater Monitoring Program (JGWMP).
12/18/1995	Consent Decree for OU-1 was entered by the Court.
01/09/1996—03/11/1996	CCL Remediation Area Near-source extraction well was installed and developed.
01/29/1996	CCL Settling Defendants and the Rhode Island Department of Environmental Management (RIDEM) finalized an agreement compensating the State for oversight costs, compensating the State for groundwater natural resource claims, and establishing an interim groundwater residual zone under State law to attempt to reach groundwater clean up standards. The residual zone covered part of the CCL Remediation Area in OU-1.
04/09/1996	CCL Remediation Area Long -term Remedial Steps (LTS) construction contract was awarded, and mobilized.
05/16/1996	EPA conducted CCL Remediation Area IRS pre-final inspection.
10/01/1995—07/01/1996	CCL Remediation Area GWTS building construction and system installation.
7/31/1996	Site identified by EPA as one of the pilot sites for the oversight reform initiative.
08/22/1996	CCL Remediation area IRS construction completed.
08/23/1996	PAC source area construction contract signed, triggered five year review; PAC Remediation Area (OU-1) Remedial Action started.
12/1996	PAC Source Area Leach field excavation and ODS completed.
1997	EPA's Assessment leads to Second Removal Action at J. M. Mills Landfill; landfill was re-secured by removing identified friable asbestos insulation and by extending the fence (OU-2).
06/15/1997	All OU-1 remedial construction completed.
08/06/1997	Final inspection of CCL remediation area IRS and LRS phases was conducted.
01/18/1997—08/31/1997	60-day start-up period for CCL remediation area downgradient extraction well system commenced. Downgradient extraction system went off-line from 02/19/97—07/29/97 due to flooding of the Blackstone River which shorted out electrical systems.
12/31/1997	Started operation and maintenance activities for OU-1.
06/1998—12/1999	Focused Investigations commenced for the PAC Downgradient Area. Included: Geophysical survey, Former Owens Corning Production Well PW-3 sampled and abandoned Soil gas survey performed, test pits excavated at underground storage tank (UST) #3 & #4 graves; soil borings advanced around PW-3 vault; PW-3 vault demolished; 2 drywells removed from Maintenance Building in PAC Downgradient Area.
11/25/98—7/13/01	EPA negotiated with PRPs to conduct OU-2 RI/FS.
10/1999	Settling Defendants for OU-1 initiated data gathering and reporting for OU-1 to support the first five-year review.
03/14/2000	PAC Source area ODS shutdown and rebound assessment initiated
08/2000—03/2001	ENSR on behalf of Lonza, Supervalu and Bestfoods submitted reports to EPA to support the first Five-Year Review of the Site.
7/13/01	RI/FS for a re-defined OU-2 commences. Work plans for the PRP-lead RI/FS were reviewed. One additional area of potential groundwater concern (Mackland Farm/Kelly House property) in Lincoln, RI and the segment of the river and aquifer to the north of OU-1 (within Cumberland and Lincoln) remained as a "potential" OU-3.
Fall 2001	A Site Inspection of OU-2 is conducted for the planning phase of the RI/FS. Low water levels in the Blackstone River allow access to Unnamed Island. Observations include additional locations where disposal practices on the island are identified. A large abandoned excavator, only previously observed at a distance from the location of the bike path, is inspected and found to be partially dismantled; vandalized cab and engine compartments and hydraulic lines severed. The excavator is identified as a potential concern to be further reviewed during the RI. Local citizen action groups initiated communications with EPA for the removal of the excavator from the river way.
12/2001	EPA's OU-2 enforcement investigations identified a significant number of additional parties potentially liable for the future cleanup of this portion of the Site. These enforcement investigations are ongoing. EPA forwarded a citizen complaint to RIDEM concerning the large excavator. Complaint includes the concern that fuel tanks and hydraulic lines contain oily fluids, which may overtop and cause a release during future flooding events on the island. RIDEM agreed to take the lead and investigate/remove fluids from the excavator. (OU-2) Forest City Residential Group, Inc. completes due diligence investigations, submits a Hazardous Materials Release Notification to RIDEM, and initiates discussions with EPA over concerns that Ashton Mill is within the boundary of the Site. These actions prompted EPA to consider its northern boundary configuration and initiates plans for limited site investigations north of OU-1 at Mackland Farm/Kelly House ("potential" OU-3).
01/03/2002	Final Declarations of Covenants and Environmental Protection/Conservation Easement signed for Lonza/PAC property. (IC for PAC source area parcel in place)
7/12/2002	RI Department of Transportation conducted a series of test pits in Cumberland (150 ft. northeast of the Pratt Dam) to delineate the lateral extent of suspected solid waste landfill operations along the river. This work was conducted as part of the design for Segment 4B of the Blackstone River Bikeway. EPA is consulted regarding a State plan to remove contaminated soils located within the proposed flood plain compensation area for the Bikeway. This area encroaches upon the southern boundary of the OU-2 portion of the Site and is considered an extension of buried wastes deposited within the Nunes parcel.
7/26/2002	EPA Administrator Christine Whitman visited the Site and announces a plan to award a $100,000 Superfund redevelopment grant to the towns of Cumberland and Lincoln for reuse planning.
04/2001—09/2002	EPA conducted the first five-year review for the Site.
06/2002	EPA conducted a limited site investigation at Mackland Farm/Kelly House ("potential" OU-3) in support of Ashton Mill "Brownfield" redevelopment project.

Fall 2002	Based upon data and results received from EPA's and Forest City's investigations, EPA no longer considers the Ashton Mill Property to be a part of the Peterson/Puritan Superfund Site. No further actions by EPA are anticipated by EPA. Further investigation into the source of the Kelly House property groundwater contamination remains in the planning stage with EPA and RIDEM. This determination is agreed to and documented in 1st Five Year Review.
09/2002	EPA submitted the first Five-Year Review Report for the Site.
2003	Owens Corning Limited Removal Investigation into extent of fiberglass waste present on the Unnamed Island (OU-2). Soil sampling and analyses for selected contaminants resulted in the removal of fiberglass waste in 2003. McNulty Properties Investigation conducted to evaluate groundwater quality and hydraulic relationship to known groundwater contamination to the south and northwest (OU-2). Various analyses performed on groundwater, surface water and sediment. Subsequently four wells were installed along the northeast boundary of the wetlands. This work initiated actions to render development properties under a partial deletion from the Site. Remedial Investigation (RI) Phase 1A conducted to meet objectives of the RI/FS as identified in the Scope of Work. Soil, groundwater, surface water, sediment and air were sampled and analyzed for various contaminants. (OU-2)
05/2003	Lonza submitted to EPA the evaluation of technical impracticability of groundwater restoration for arsenic for the PAC remediation area (OU-1). This issue remains under Agency review while additional data is collected.
06/2003	Lonza submitted to EPA results of file review identifying the Lukoil (former Mutual) Gas Station facility as the likely source of benzene, toluene, ethylbenzene, and xylenes (BTEX) (and methyl-ter-butyl-ether (MTBE) in the southwest corner of the PAC source area (OU-1).
07/2003	Lonza submitted a request to RIDEM to designate a residual zone for arsenic in groundwater at the PAC remediation area (remains under Agency review while additional data is collected).
07/16/2003	Owens Corning began its limited removal action work at the Unnamed Island (OU-2). Work included construction of an access way (bridge improvement) in order to cross equipment and materials to/from the island and allowing parallel remedial investigations to take place by others. During the removal action, the large excavator abandoned on the Unnamed Island was removed, eliminating the risk of hydrocarbons impacting the river. This effort was conducted jointly by RIDOT, RIDEM, USACE, EPA, and local citizen action groups. (OU-2).
11/13/2003	Fieldwork for Owens Corning's Limited Removal Action at Unnamed Island (OU-2) was completed.
2004	Remedial Investigation (RI) Phase 1A Expanded Investigation conducted to fill data gaps identified in the Phase 1A RI at OU-2. Soil, groundwater, surface water, and sediment were sampled and analyzed for various contaminants. (OU-2).
3/1/2004	Owens Corning receives approval of the Completion Report concerning the Limited Removal Action at the Unnamed Island (OU-2).
06/28/2004	Final Declarations of Covenants and Environmental Protection/Conservation Easement signed for Swissline/Tony Realty and Pawlick properties, (2 parcels) OU-1 PAC source area OU-1 (ICs in place for a portion of OU-1).
07/2004	A removal action was completed by Vanasse, Hangen, & Brustlin, Inc. on behalf the Rhode Island Department of Transportation during the construction of Segment 4B of the Blackstone River Bike Path. This action included the removal of approximately 11,600 tons of hazardous waste soil, solid wastes, and other soil. (OU-2).
08/2004	PAC Remediation area oxidant delivery system was decommissioned and associated wells abandoned in accordance with the EPA and RIDEM-approved closure plan.
2005	Remedial Investigation (RI) Phase 1B conducted to support the Feasibility Study (FS) and fill data gaps identified in the Phase 1A Expanded Investigation. Soil, groundwater, surface water, and sediment were sampled and analyzed for various contaminants. Conducted sediment probing and benthic community surveys and benthic toxicity tests in Blackstone River. Fish community survey conducted with fish samples collected on whole bodies, filets and carcasses. Wildlife and vegetation habitat surveys also conducted along with Rapid Bioassessment Protocol. (OU-2).
05/09/2005	The Environmental Protection Agency (EPA) Region 1 announced the partial deletion of a portion of the Site, owned by Macklands Realty, Inc. and Berkeley Realty, Co., from the National Priorities List. (OU-2).
06/2005	Owens Corning began the excavation of 3,451 tons of fiberglass-containing materials from a former disposal area at Mackland Farm/Kelly House property ("potential" OU-3).
10/15/2005	The Guardian Trust-Lonza Site Acceptance Agreement was signed. IC Implementation for a portion of the PAC Remediation Area commenced
2006	Nunes Parcel Investigation commenced to delineate limits of buried waste. Soil sampled and analyzed for various contaminants (OU-2).
10/12/2006	Letter issued by EPA to OU-1 parties concerning need for new Scope of Work and updated Quality Assurance Project Plan (QAPP) for JGWMP. Work to achieve this goal is ongoing with outcomes to be established in 2008.
11/16/2006	EPA provided notice to PRPs that the Second Five-Year Review for the Site would be conducted in Fiscal Year 2007. This letter also provided conditional approval of the settling defendants proposed groundwater sampling program (JGWMP Round 18) in support of the second five-year review.
01/18/2007	SuperValu submitted to EPA a draft final Preliminary Survey (for use in filing ICs) for the SuperValu parcel in OU-1.
4/16/2007	The Guardian Trust-Unilever Site Acceptance Agreement was signed. IC Implementation Plan and Operations & Maintenance Plan for the CCL Remediation Area under development. (OU-1)
03/01/2007	US EPA provided written approval of the interim QAPP for Round 18 of the JGWMP.
03/2007	Supplemental groundwater monitoring conducted throughout the Site to evaluate groundwater quality for VOCs and metals in support of the Five Year Review.
06/15/2007	EPA receives revised SuperValu parcel survey as a component of the work in proceeding with ICs on affected properties (PAC downgradient area).
6/30/2007	Draft RI Report for OU-2 submitted to EPA. EPA has identified certain deficiencies that required extensive modifications to portions of the report prior to completing its review. As such, a comprehensive review is on hold pending these first revisions.
06/2007	Owens Corning submited Final Closeout Report for Limited Removal Action at Mackland Farm/ Kelly House. ("Potential" OU-3). All work under the terms and conditions of the bankruptcy agreement are complete.
09/30/2007	EPA submited second Five-Year Review Report for the Site (planned completion date).

3.0 BACKGROUND

The following section discusses pertinent physical characteristics and land use at the Site.

3.1 General Setting

The Site is located along the Blackstone River within the Towns of Cumberland and Lincoln, Rhode Island. The Site "study area" occupies 500 acres and is approximately two miles long from the Ashton Dam to the north to the Pratt Dam at its southern end, and extends 2,000 feet to the east and west of the main river channel. The study area comprises a portion of the Blackstone River and aquifer system from the Ashton Dam (northern end) to the Pratt Dam (southern end). Specifically, this area includes: 1) an industrial park incorporating the former Peterson/Puritan, Inc. facility (formally known as CCL Custom Manufacturing Inc. and now most recently known as KIK Custom Products), 2) the former Pacific Anchor Chemical Company (PAC), 3) other fully-operational industrial facilities, 4) an inactive landfill known as J. M. Mills Landfill, 5) an inactive solid waste transfer station, 6) sand and gravel operations, 7) a segment of the Providence and Worcester Railroad track, 8) the Blackstone River State Park, 9) impacted municipal water supply wells, and 10) numerous interspersed areas of undeveloped land, flood plain, and wetlands. For consistency, with former documentation, the property now operated under the name KIK will continue to be referred to as CCL, and the former PAC property will continue to be referred to as PAC throughout this document. The Site study area contains over 40 separate parcels owned both privately and by local governments and is being addressed under Superfund as a multi-source groundwater contamination site with multiple Operable Units (OUs) (Figures 1 and 2, Appendix A).

Blackstone River at Martin Street (USEPA photograph)

3.1.1 Blackstone River

The Site is located within the Blackstone River Valley. The Blackstone River begins in Worcester, Massachusetts and flows southeasterly for 46 miles to the tidal Seekonk River in Pawtucket, Rhode Island, which, in turn, flows south to the Providence River (a northern extension of Narragansett Bay). The Blackstone River Valley is the birthplace of the American Industrial Revolution. In recognition of its national significance, the U.S. Congress officially created the Blackstone River Valley National

Heritage Corridor in 1986 as the nation's second National Heritage Corridor. This corridor stretches from the headwaters of the Blackstone in Worcester, Massachusetts to Narragansett Bay in Providence, Rhode Island, encompassing 24 cities and towns and 400,000 acres. The Blackstone River was also named an American Heritage River in 1998. The National Heritage Areas Act of 2006 included the reauthorization of the John H. Chafee Blackstone River Valley National Heritage Corridor Commission for an additional 5 years.

On a regional perspective, the Blackstone River was once described as the nation's hardest working river, with dozens of dams along its length. By the early 1800s, numerous dams had largely eliminated runs of anadromous fish. Riparian habitat was developed and became fragmented. Wastewaters from factories and municipalities were discharged to the river with resulting accumulation of metals and other contaminants depositing in mill ponds. Approximately two-thirds of the Site lies within the 100-year flood plain of the Blackstone River. In general, the northeast portion of the Site sits at a higher elevation (US EPA, 1993a).

3.1.2 Wetlands

Based on the site visit in May 2007 and a review of documents, there are various wetland ecosystems contained within the Site study area. This area includes five regions and wetland types. These types include: lacustrine and palustrine environments associated with the Blackstone River, the adjacent canal and ponded areas along the river, narrow fringing wetlands consisting of emergent and shrub/scrub communities. Just south of the restored Kelly House is a palustrine red maple forest between the Blackstone Canal and the Blackstone River. This area was recently impacted by silt, sand, and gravel carried into the wetland forest when a portion of the east bank of the Blackstone Canal and bike path was washed out in the spring of 2007 by overtopping flows caused by restricted flow conditions in the canal at a downgradient construction site. The canal bank and bike path has since been repaired.

3.1.3 Groundwater

Groundwater generally flows towards the Blackstone River, to the southwest on the Cumberland side and to the east to the Lincoln side of the river. The Blackstone River Valley occupies a bedrock trough filled with glacially derived sediments and postglacial alluvium. The valley-fill deposits are relatively thin (10 to 20 feet) in the northwestern portion of the Site where the valley is shallow and quite narrow. Deposits thicken to greater than 130 feet to the southeast as the trough widens and deepens at the south end of the Site. Deposits pinch out along the steep bedrock valley walls to the east and west. Till is found at the base of the bedrock trough and is dense with high silt content, though it is somewhat more sandy in some locations. The till also contains boulders of various sizes, some more then five feet in diameter. The bedrock is comprised primarily of hard quartzite and, to a lesser extent, more friable schist (USEPA, 2002).

The dominance of sand and silt throughout the valley near the Site and presence of poorly transmissive sediment at depth near the J.M. Mills landfill indicate a lacustrine depositional setting, which is typical of many valleys in the glaciated northeast. Deltaic and lake-bottom sediment probably compose the valley-fill sequence. Post-glacial alluvium forms a thin veneer on the glacial sediments, generally less than 20 feet thick.

3.1.4 Land Resources and Use

Land uses surrounding the Site comprise a mixture of industrial, commercial, residential, and recreational parcels. Immediately to the north and west of the Site is predominately residential. To the east is commercial/residential and to the south predominately commercial. Over 1,000 residences exist within a one-mile radius, and 12,000 people live within a 4-mile radius of the Site. The nearest residence is less than ¼-mile away (USEPA, 2002).

In recent decades, the Blackstone River has undergone resurgence through the efforts of federal, state, and local government agencies, non-profit organizations, and the private for-profit sector. Surface water quality is much improved due to enforcement of the federal Clean Water Act (CWA), and wastewater discharge permits are being further tightened to improve water quality. Initiatives are underway to enhance recreation along the river corridor, redevelop old mill sites (brownfields), restore mill ponds and riparian habitats, inventory natural resources, study water quality, and restore anadromous fish to the river in Rhode Island. Collectively these efforts promise to further river restoration and enhance the river's value to residents of the Blackstone Valley. Each incremental step signifies the public's backing and demand for improving the quality of the Blackstone River as a recreational corridor and vital economic and environmental resource.

Efforts related to restoration and redevelopment of the Blackstone River over the last 5 years is summarized in the following sections. This includes updates concerning water quality, fisheries, rare species, recreation, and redevelopment initiatives. Activity near the Site includes construction of a portion of the Blackstone River Bikeway, establishment of the Blackstone River Park and the Kelly Museum, habitat restoration at the Lonsdale Drive-in in Lincoln, and redevelopment of the Ashton Mill complex. RIDEM has developed or is developing a series of total maximum daily loads (TMDL's) to improve water quality in the Blackstone. In addition, Federal and State agencies are planning to restore anadromous fish in the Blackstone River, including upstream passage facilities at the first four dams on the lower Blackstone River by 2010.

3.1.5 Surface Water Resources

At the time of the OU-1 Baseline Risk Assessment in 1993, the Blackstone River was classified by the State of Rhode Island as a Class C surface water body. Class C waters are designated for secondary contact recreational activities, and fish and wildlife habitat. They shall be suitable for compatible industrial processes and cooling, hydropower, aquacultural uses, navigation, and irrigation and other agricultural uses. These waters shall have good aesthetic value. Class C waters are not designated for primary recreational uses or public water supply even after treatment.

The Blackstone River is currently classified as a Class B1 surface water body that has an established goal of "fishable and swimmable". Class B waters are designated for fish and wildlife habitat and primary and secondary contact recreational activities. They shall be suitable for compatible industrial processes and cooling, hydropower, aquacultural uses, navigation, and irrigation and other agricultural uses. These waters shall have good aesthetic value. The improvement in classification from Class C to B1 reflects reduced concentration of total coliform and fecal coliform bacteria in the river. This improvement allows for primary contact recreation (i.e., swimming). However, the B1 classification indicates that while all Class B uses must be supported by water quality, primary contact recreation may be "impacted due to pathogens from approved wastewater discharges" (RI WQR, Rule 8(B)(1)).

In 2005, RIDEM modified the permit for the Woonsocket, RI WWTP. The permit modifications established seasonal total nitrogen limits from May through October. Construction of facilities

required to meet these conditions was expected to be completed by 2008. The proposed improvements were intended to reduce productivity and improve dissolved oxygen conditions in the Providence and Seekonk Rivers.

The most recent (2006) 303(d) Clean Water Act report prepared by RIDEM lists the Blackstone River as impaired because of copper, lead, pathogens, nutrients, hypoxia, ammonia, and biodiversity impacts. TMDL's (total maximum daily loads) are currently under development for copper, lead pathogens, and biodiversity impacts. TMDLs or control actions functionally equivalent to TMDLs have been developed for nutrients; ammonia, and hypoxia, however, standards will not be met before 2009. The report indicates wastewater discharge permits for the Woonsocket wastewater treatment plant and other facilities will be reissued to better address eutrophication.

The USEPA has issued a draft NPDES discharge permit for the Upper Blackstone River WWTP in Worcester in May of 2007. The draft permit sets limits that are more stringent on discharge of phosphorus and total nitrogen into the river. If these limits go into effect, they are expected to improve water quality (reduce productivity and hypoxia) in the Blackstone, Providence and Seekonk Rivers.

The Rhode Island Rivers and Classification Policy—The classification plan was amended in 2004 by the Rhode Island Rivers Council. The Plan is intended to provide guidance for the management and protection of Rhode Island's river and estuarine watershed resources at the state and local levels. Its broad objectives are to protect drinking water supplies and pristine rivers, to encourage recreational use of rivers, to foster the creation of greenways, and to provide for the clean-up of rivers. The plan classifies freshwater into four classes: Pristine Waters, Waters Supplies, Open Space Waters, and Recreational Waters. The Blackstone River near the Site (from Manville Dam to the Valley Falls Marsh) is classified as non-contact recreational. Recreational waters include "*water bodies, rivers, or river segments that are readily accessible, that may have some development along their shorelines, and may have undergone some impoundment or diversion in the past. These shall include sections of rivers along mill villages, but shall not include sections where development may be characterized as urban. These waters are typically situated in suburban areas and are generally suitable for canoeing and other non-contact recreational activities. They may function as open space corridors or greenways*."

3.1.6 Groundwater Resource

Groundwater within the Site is not currently used for drinking water. The current state-designated groundwater classification at the Site is GAA. The GAA classification, as designated by RIDEM Rules and Regulations for Groundwater Quality, is defined as "those groundwater resources which the Director has designated to be suitable for public drinking water use without treatment" (RIDEM, 2005).

3.1.7 Biological Resources

A plan to restore self-sustaining populations of river herring and shad to the Blackstone was published in 2002 by the Narragansett Bay Estuary Program and Rhode Island Departmental Environmental Management Division of Fish and Wildlife (NBER 2002). Phase 1 of the restoration plan focuses on providing upstream fish passage at four dams on the lower Blackstone River (Main Street Dam, Slater Mill Dam, and Elizabeth Webbing Dam in Pawtucket Rhode Island, and Valley Falls Dam in Central Falls) as well as measures to protect out-migrating juvenile fish. The Blackstone River area between the Valley Falls Dam (approximately 2 miles down stream of the Site) and the Ashton Dam (at the

north end of the Site) represents over 80 percent of the total available habitat to be restored in Phase I and about 10% of the total restorable habitat in Rhode Island. The Pratt Dam (located at the south end of the Site) also bisects this reach and is passable by anadromous fish under most flow conditions. Design of fish passage facilities is underway using funding from the Natural Resources Conservation Service (NRCS). The Elizabeth Webbing Dam was recently acquired by the State of Rhode Island and may be removed. Access agreements to provide for fish passage have been negotiated with the other three dam owners. The goal is to have fish passage at the first four dams by 2010.

In recent years, additional information has become available about the occurrence of rare species in the Blackstone River near or within the Site. The draft OU-2 RI (Arcadis, 2007) noted occurrence of two "concern" species in the study area: the great blue heron (*Ardea herodias*) and the American brook lamprey (*Lampetra appendix*). The OU-2 Draft RI noted occurrence of American eel throughout the study area. Although American eel populations are apparently in decline throughout its range in eastern North America, it is not a federally or state listed threatened or endangered species. The U.S. Fish and Wildlife Service completed a status review of the American eel in 2007 (USFWS 2007), concluding that protecting the eel as an endangered or threatened species under the Endangered Species Act is not warranted.

A census of the Rhode Island odonates (i.e., dragon flies and damselflies) sponsored by the Rhode Island Natural History Survey has greatly expanded knowledge of these species in Rhode Island. Survey records indicate two rare dragonflies occur in the Blackstone River within or near the Site study area. The arrow clubtail dragonfly (*Stylurus spiniceps*) is reported from the Massachusetts state line to a few hundred yards below the Ashton Dam (Brown, 2007). It may occur further downstream to the OU-2 study area and beyond. The arrow clubtail is listed as a "concern" species under the Rhode Island State Endangered Species Act. The spine crowned clubtail (*Gomphus abbreviatus*) is reported from the Blackstone River downstream from the Ashton Dam. This rare species is currently not listed in Rhode Island but is listed as endangered in Massachusetts. The draft OU-2 RI noted the occurrence of the arrow clubtail upstream of the Site but did not conduct an inventory of odonates.

Only the three most widespread species of mollusk (*Eliptio complanata, Pyganodon cataracta, Alasmidonta undulata*) are known to occur in the Blackstone River Basin (Raithel and Hartenstin 2006). Although suitable habitat is present, they concluded that the mussel fauna in the Blackstone River Basin was decimated by past industrial development, and that recovery of mussels has been hindered by the inability of mussels to re-colonize those river stretches still isolated by dams. Shells of *E. complanata* and *P. cataracta* were noted on the OU-2 Unnamed Island during a June 2007 site visit (Penko, pers. observation).

3.1.8 Recreational Resources

Recreational opportunities near the Site have increased in the last 5 years. By the end of 2007, an 11-mile segment of the Blackstone River Bikeway is planned to be open to the public. The completed segment begins south of Woonsocket, RI and heads south through the towns of Cumberland and Lincoln. The Blackstone River Bikeway will ultimately extend forty-eight miles from Providence, RI to Worcester, MA. When completed, the bike path project will result in a mostly off-road alternative transportation facility passing through the historic John H. Chafee Blackstone River Valley National Heritage Corridor and will serve as the region's premiere multi-use recreational facility. This bi-state project will connect New England's second and third largest cities serving a population of more than one million. The bikeway will link many of the Valley's significant natural and historic features. Within the Site, the nine million dollar Berkeley-Martin Street bridge and bikeway connector was completed this August using Federal Transportation funds. With the opening in January 2006 of the I-

295 Visitors Center at the Blackstone River State Park in Lincoln, this facility shuttles hikers and bikers on an entry path to the Captain Wilbur Kelly House Transportation Museum and onto the Bikeway. It is estimated that an average of 25,000 visitors utilize this bike path yearly. This number is expected to increase over time as other sections of the bikeway are completed, the population of surrounding communities increases, and public awareness of the resource grows.

Water access to the Blackstone River and Blackstone canal has also been improved. A canoe passage was recently constructed at the Pratt Dam. Paddlers can also make use of a water trail loop by paddling down the Blackstone River and back up the Blackstone Canal to the Kelly House Museum. The river is classified as quick water (Class I-II rapids). A canoe landing, ramp, and gate at the Pratt Dam allows portage to and from the river and canal via the bikeway.

During the review period, there has been an increase in access to the impacted parcels in both OU-1 and OU-2. In OU-1, pedestrians are accessing the Quinnville Wellfield. The town of Lincoln has had to address several incidents of vandalism and trespass to the Quinnville Wellfield pump houses. In OU-2, access to the Unnamed Island increased considerably as further improvements were made to the portage access route at the Pratt Dam.

Blackstone River Bikeway at Kelly House

The Blackstone River is a valuable recreational resource in the vicinity of the Site. The river throughout Cumberland and Lincoln is a popular fishing area due to the abundance and variety for resident fish species. Resident fish include largemouth bass, white sucker, bluegill, and pumpkinseed.

Aside from the resident fish, the river is stocked with farm-raised trout (rainbow, brown, and brook) in the spring and fall. Trout are currently stocked in the Blackstone at four locations near the Site: Albion (near Highland fall condominiums), Ashton Meadows (below the Ashton dam), below the Martin Street Bridge (Berkeley), and below the Valley Falls Dam (Edwards 2007).

The National Park Service, the states of MA and RI and numerous watershed groups are promoting recreational use of the Blackstone River. Public use of the river in Rhode Island and adjacent public lands will likely increase in the future.

Kayaks and Canoes at Ashton Mill Condominium

3.2 Development Efforts

Since 2002, hundreds of residential units have been constructed near the Site. These include both new development and redevelopment of old mills for residential use. Build-out analysis for Lincoln and Cumberland indicate significant room for growth and, based on development rates in the last decade, hundreds of new residential units may be added each year within the two towns.

3.2.1 Ashton-Pratt Corridor Redevelopment Plan

In the summer of 2002, the Towns of Cumberland and Lincoln, Rhode Island were granted funds from the EPA under the Superfund Redevelopment Initiative (SRI) Pilot Grant to perform an analysis of the Ashton-Pratt Corridor. This analysis included evaluating existing land uses within the project area, determining the potential future land uses based on the needs and recommendations of the towns, citizens, property owners and users, and developing a Redevelopment Plan for the Ashton-Pratt Corridor. The final plan was published in 2004 and endorsed by the Towns of Cumberland and Lincoln. The towns of Cumberland and Lincoln have both updated their Comprehensive Plans and in 2004 adopted the redevelopment plan for the Ashton-Pratt corridor. The plan envisions establishment of the Ashton-Pratt Corridor as a "dynamic node" along the Blackstone River and seeks to enhance natural resources and recreation opportunities, preserve the economic base, and establish a sense of place. The following list provides specific objectives for the project area that were identified either by the steering committee or because of the public coordination process:

1) Enhance recreational resources for all users;
2) Protect and enhance the natural environment;
3) Maximize access to the river and canal;
4) Establish a sense of place by implementing a unified theme for the corridor;
5) Preserve and stabilize the economic base for businesses in the project area;
6) Improve transportation facilities and traffic; and
7) Improve aesthetics.

3.2.2 Lincoln and Cumberland Comprehensive Plans

Both Lincoln and Cumberland revised their Comprehensive Plans (master plans) in 2003. The plans provide recommendations for protection of the Blackstone River and revitalization of the river corridor within or near the Site.

3.2.3 Ashton Mill

The River Lofts at Ashton Mill, a residential community in the historic Ashton Mill building in Cumberland opened in 2006. The project consists of 184 residential rental units. This redevelopment is downstream of the Ashton dam and adjacent to the Blackstone River Bikeway.

This Property was under close review in 2001 because a developer (Forest City) became interested in redeveloping this historic mill site into a multi-unit residential community. Under the supervision of RIDEM, a due-diligence site investigation was completed in the Fall of 2001, which included the installation of soil borings and monitoring wells, the sampling and analysis of soil and groundwater samples, a site inspection, review of historic property use, and a review of current regulatory status. RIDEM issued a Remedial Decision/Approval Letter to Industrial Factory Rentals Corp. on August 19, 2002, documenting the State's approval of conceptual and actual cleanup actions underway at the Ashton Mill Property. In addition, EPA no longer considers the Ashton Mill Property to be a part of the Peterson/Puritan Superfund Site.

Ashton Mill

3.2.4 Lonsdale Bleachery Redevelopment Plan

The Lonsdale Bleachery is the location of a former textile mill abutting the Blackstone River in Lincoln, Rhode Island. It is 30 acres and is located in Lincoln downstream of Pratt Dam. On July 30, 2004, an emergency response was conducted by RIDEM in response to a petroleum odor and sheen that were observed downstream on the Blackstone River during occasions when the river was at a summer low flow. The former Lonsdale Bleachery was found to be the source of the sheen. At the request of RI DEM, EPA mobilized on August 5, 2004 to support the oil spill response. Features of this parcel included aboveground oil tanks (empty), a former coal shed, concrete oil storage bunkers, and underground piping. Historic oil releases from these structures caused soils underlying the

bunkers to become saturated with oil. This oil pooled on the water table and acted as the source of oil that discharged to the river during times of low flow.

EPA mobilized its Emergency Rapid Response Services (ERRS) contractor to the site to conduct oil spill responses pursuant to an OPA 90 Project Plan. These cleanup activities are focused on identifying and removing the source(s) of the oil release and eliminating further release of oil to the Blackstone River. From October 2006 through December 2006, EPA and the ERRS contractor have excavated the underlying oil-saturated soils and removed the floating product. Over 4,400 tons of oil-saturated soils were excavated during this project. The excavation area was then backfilled with clean fill and seeded for vegetative cover during the spring of 2007. As of July 2007, a significant amount of residual oil was still seeping into the river. RIDEM will continue to address this release by maintaining floating booms and sorbents along the riverbank while an adjacent parcel also undergoes further investigation.

The town of Lincoln sponsored preparation of a redevelopment plan for the site which was completed in 2005 (Town of Lincoln 2005). The recommended plan proposed improved infrastructure to access the site, mixed use development (including residential use), improved recreational access to the Blackstone River, and to the Blackstone River Bikeway.

3.3 Restoration Efforts

Several habitat restoration projects have been accomplished along Blackstone River Valley.

3.3.1 Lonsdale Drive-In

In 2003, the USACE and RIDEM removed the former Lonsdale drive-in theater to restore grassland habitat, open water, and wetland along the Blackstone River in Lincoln, RI. The site is about 0.5 miles downstream of the Pratt Dam. The wetlands provide breeding and nursery habitat for warm water fisheries and foraging habitat for shorebirds, wading birds, and waterfowl. A portion of the bikeway passes through this area above the wetland/flood plain complex.

3.3.2 Campaign for a Fishable-Swimmable River by 2015

In 2003, the nonprofit Blackstone River Coalition working with local watershed councils and other partners launched the Campaign for a Fishable/Swimmable Blackstone River. The campaign seeks to combine the efforts of federal, state, and local agencies, as well as non-profit organizations, academic institutions and businesses to improve water quality to achieve a fishable/swimmable Blackstone River by 2015. The campaign seeks to:

- Reduce storm water impacts
- Implement more stringent limits on nutrients discharge from wastewater treatment plants
- Breach or remove appropriate dams to restore river hydrology
- Establish fish passages for anadromous species at the four lower-most dams
- Build a system of river access points to increase opportunities for fishing and passive recreation
- Develop programs to increase watershed awareness, appreciation, and stewardship.

3.4 History of Contamination

The history of contamination at the two operable units and other areas of potential concern is described in the following sections. See Appendix A, Figure 1 for a description of the boundaries pertaining to the operable units.

3.4.1 Operable Unit 1

Operable Unit 1 (OU-1) consists of the industrial park near Martin St. in Cumberland and the Quinnville well field in Lincoln. The OU-1 cleanup addresses the CCL Custom Manufacturing Inc. (formerly Peterson/Puritan, Inc.) facility solvent spill, Pacific Anchor Co. (PAC) leach fields, and contaminated soils and groundwater.

The former Peterson/Puritan, Inc. plant was built in 1959 as a packager of aerosol consumer products. A rail car incident resulting in a product tank spill occurred on the facility's property in 1974, releasing an estimated 6000 gallons of solvent. In 1976, following a major fire, the plant was rebuilt and remains in operation. In 1979, volatile organic contaminants were detected in area wells during state-wide sampling. The Martin Street Well and Lenox Street Well in the Town of Cumberland and the Quinnville Wellfield in the Town of Lincoln were closed in 1979 due to contamination, and remain out of service. Attempts to flush contaminants from Lincoln's three wells were abandoned after repeated efforts to remove the contaminants from the aquifer failed. The Town of Lincoln since has been connected to an alternate water supply (through a third party settlement) while the Town of Cumberland absorbed the cost of losing its well by increasing production from remaining town water supplies.

The PAC facility manufactured specialty chemical materials for use in detergents, cosmetics, agricultural, food, and general industrial chemicals. The facility originally was operated by Universal Chemicals and subsequently by Lonza Inc. (Lonza), Trimont Chemicals, and Pacific Anchor Chemical Corporation. The PAC Remediation Area also includes a number of separately owned/operated parcels which includes a warehouse and a former maintenance garage. This property was formerly owned and operated by Wetterau Incorporated, and is currently owned and operated by Berkeley Acquisition Corp. (d.b.a. Dean Warehouse).

3.4.2 Operable Unit 2

The second Operable Unit of the Site, located immediately south of OU-1, contains approximately 100 acres. OU-2 is located along the Blackstone River and includes the J. M. Mills Landfill, which accepted wastes from 1954 through the early 1980s. The study area for OU-2 is located predominately in the town of Cumberland (except a small area within the jurisdiction of Lincoln) and is surrounded by industrial, commercial, residential, and semi-rural properties. Bordering OU-2 to the north is the Hope Webbing Company (aka: Hope Global) property located at 88 Martin Street (which is within OU-1). Across the river to the north-west is the Quinnville Wellfield. To the south is the Stop and Shop Market (and strip mall) on Mendon Road (Route 122); to the east is the wetlands known locally as “New River;” and former sand and gravel operations, and to the west is the Blackstone River and Canal.

OU-2 contains many parcels. EPA believes the most contaminated parcel is the privately owned 52-acre J. M. Mills Landfill, which accepted mixed municipal and industrial wastes from 1954 through 1986. Immediately to the south-east of the Landfill is a privately owned 34-acre unnamed island located in the Blackstone River. Recent investigations indicate that buried wastes are found on the

island. Down river from the unnamed island is the Pratt Dam, which provides an access point to the island. OU-2 also includes the 26 acre Lincoln "Quinnville" Municipal Wellfield and the Cumberland Lenox Street Municipal Well. These wells were used by the towns of Lincoln and Cumberland as a municipal water supply until 1979 when they were closed by the Rhode Island Department of Health due to the presence of volatile organic contaminants detected in the water. A section of the Providence and Worcester Railroad line runs through OU-2 and forms the boundary of the Landfill's eastern slope while the river forms the Landfill's western slope. South of the Landfill and within the boundary of OU-2, a former privately- owned transfer station operation arranged for waste to be disposed of at the Landfill. Here also, the investigations has indicated that wastes are buried within portions of this parcel. Other areas of OU-2 include portions of the Blackstone River and an adjacent canal, the Blackstone River Bikeway and a portion of a privately owned sand and gravel operation. Access to the OU-2 study area is generally from gravel and paved easements paralleling the Providence and Worcester Railroad tracks in the Town of Cumberland from Martin Street to the north and Route 122 (Mendon Road) to the south.

EPA determined that the J. M. Mills Landfill was used for disposal of wastes, including wastes containing hazardous substances. This property was primarily used as a privately owned, co-disposal landfill. Sewer sludge also was disposed at the landfill as part of the daily operation. Various types of large, bulky solid materials (including, but not limited to, tanks, crushed drums, pre-formed concrete structures, railroad ties, and demolition debris) are deposited next to the Landfill, along the north and south access roads and along the bank of the river. The now closed Lenox Street Well in Cumberland is located approximately 1000 feet southeast from the flank of the Landfill. The Quinnville Wellfield is immediately across the river in Lincoln.

The unnamed island contains areas of suspect disposal operations, evidence of past sand and gravel extractions, and numerous tires and other bulky wastes are scattered throughout. An abandoned track-mounted 59-ton Bucyrus-Erie excavator containing oils, greases and fuel was removed from the island in 2003. Access to the island had been very limited in the past due to high water.

Interactions between OU-1 and OU-2 are uncertain, and there could be additive or synergistic effects in contaminant pathways. The Remedial Investigation and Feasibility Study for OU-2 is underway and will address these areas of concern. A draft remedial investigation report for OU-2 (Arcadis, 2007) is undergoing Agency review at the present time.

3.4.3 Other Areas of Concern

Other portions of the Site study area remain less defined and may be subject to further investigation. Groundwater contamination across the river and to the north from OU-1 has led to the consideration of a third (potential) operable unit. This potential OU-3 includes the Mackland Farm/Kelly House property on the Lincoln side of the River and associated pasture and flood plain to the Blackstone River.

The Mackland Farm/Kelly House property is an elongated island in the Blackstone River in Lincoln, Rhode Island. This area is bounded to the north by the Ashton Dam, to the west by the Blackstone River Canal, and to the east by the Blackstone River. The southern edge of the property meets the narrow strip of land that was formerly the canal towpath. Today this area is part of the Rhode Island Blackstone River Park and Bikeway. This property is currently owned and operated by the State of Rhode Island. The property contains a small building dating back to the 1830s, known as the Kelly House, and associated farmland. Known easements include utilities to the house, the Route 116

highway overpass, the Narragansett Bay Commission's sewer interceptor, Town of Lincoln Water Department municipal water supply test wells, the Bikeway, and the historic canal.

During the previous site-wide remedial investigations conducted in 1987 and 1988, the Lincoln test wells installed on the Mackland Farm/Kelly House property were sampled and found to contain volatile organic compounds (VOCs). Trichloroethene was detected slightly above MCLs. Contaminants of concern found in groundwater during this early investigation include trace to detectable levels of 1,1-dichloroethane, 1,1,1-trichloroethane, 1,1,2,2-tetrachloroethane, benzene, trans-1,2-dichloroethene, trichloroethene, acetone, chloroform, chromium, copper, lead, nickel, cyanide and arsenic. Additionally, surface water and sediment samples collected in the canal and the river in the immediate vicinity revealed semi-volatile organic compounds and heavy metals at concentrations above background levels.

As discussed in detail in the First Five Year Review (2002), the Mackland Farm/Kelly House property may require further consideration for investigation into the nature and extent of the groundwater contamination as a potential OU-3 and remains in the planning stage.

3.5 Initial Response (Site Related)

The town of Lincoln closed Quinnville Wellfield for drinking water use after contamination of the water supply was discovered in 1979. In a settlement with Peterson/Puritan, Inc. (a potentially responsible party to OU-1), the town converted its entire water supply to other municipal water sources, mostly from the city of Providence.

In 1990, EPA administratively subdivided the Site into Operable Units. EPA conducted a removal action at the Site in 1992 by (a) constructing a fence around the former J. M. Mills Landfill (within OU-2) to restrict access and (b) removing drums containing hazardous substances from the base of the landfill. In November 1997, a second removal action was conducted at OU-2 to address recently disposed asbestos-containing wastes found outside of the fenced-in area of the Landfill. The security fence was extended in 2001 to limit further dumping, including asbestos-containing materials, and maintain access restrictions at this portion of the Site. EPA and State personnel conduct frequent inspections, including monitoring the integrity of the fence and maintaining communication with local officials concerning security, occasional trespass, and solid waste disposal issues on OU-2.

3.5.1 Limited Removal Actions Undertaken by Owens Corning

In 2003, The Owens Corning Company, under the proceedings of a Chapter 11 bankruptcy, entered into an unprecedented agreement with EPA and RIDEM to resolve their liabilities in performing actual work rather then participating in protracted negotiations concerning the anticipated cost of the OU-2 cleanup. Two "Limited Removal Action" work plans were submitted for approval to EPA and RIDEM that were associated with two separate and parallel limited solid waste removal projects along the Blackstone River, within the National Heritage Corridor, and associated with the Site. These actions were planned by Owens Corning in response to alleged past waste disposal practices by the Company in two distinct areas known as the "Unnamed Island" and "Mackland Farm", respectively. The plans and eventual actions taken by Owens Corning were overseen and approved by EPA and RIDEM. In summary, Owens Corning removed some 55 tons of waste from the Unnamed Island and 3,450 tons of waste from the Mackland Farm/Kelly House parcel and transported these materials to the RI Resource Recovery Corp. (Central Landfill) facility in Johnston, Rhode Island. The total cost of these limited removal actions was approximately $600,000. A completion report was submitted to EPA and RIDEM and was approved in January 2004 for the Unnamed Island Limited Remval Action.

A completion report was also submitted to EPA and RIDEM for approval in July 2007 for the Mackland Farm Limited Removal Action (Owens Corning, 2007)

3.5.2 Lead-contaminated Soils in Construction of the Bikeway at Pratt Dam

On property immediately south of and extending onto the Nunes parcel the State undertook certain cleanup actions in order to construct its Segment 4B of the Blackstone River Bikeway. As part of the bikeway construction, the RI Department of Transportation and the Department of Environmental Management needed to construct a flood plain compensation area for the river. This operation included the removal of 8,214.15 tons of soil characterized as hazardous waste and an additional 3,396.16 tons of solid waste soils, solid waste refuse and soils approved for use as daily cover was shipped to Central Landfill for a total excavation of 11,610 tons and a at a cost of approximately $1,500,000. These soils were contaminated primarily with lead, and to a lesser extent, arsenic, volatile and semi-volatile organic compounds and trace amounts of pesticides. Completed in July 2004, this soil removal operation indicated to EPA that the extent of the hazardous substances contained in surface and subsurface soils may extend further into Lots 18 and 19 (Nunes parcel) which is within OU-2. Further details regarding this cleanup effort can be obtained from the RI Department of Transportation.

3.6 Basis for Taking Action

Groundwater at OU-1 is contaminated with chlorinated solvents, volatile organic compounds (VOCs) phthalates, and heavy metals such as arsenic. Hazardous substances in concentrations above health based levels were identified during the Remedial Investigation and Feasibility Study (RI/FS) conducted from 1986 to 1993. EPA completed a baseline human health risk assessment for OU-1 in June 1993. Potential human health effects associated with exposure to contaminants of potential concern were estimated for various exposure scenarios. Response actions were developed to address risk from exposure scenarios that exceeded EPA's acceptable range. An ecological risk assessment conducted at the same time determined that contaminants associated with OU-1 would not likely cause significant ecological harm. The Contaminants of Concern (COCs) for OU-1 as identified in the ROD are presented in Table 2. Contaminants of potential concern (COPCs) for the ongoing remedial investigation of OU-2 are presented in Figure 5 in Appendix A.

Table 2. Operable Unit 1 COCs for Soil and Groundwater.

Soils	Groundwater
1,1-Dichloroethene	1,1-Dichloroethene
1,2-Dichloroethene	1,2-Dichloroethene
Methylene Chloride	Methylene Chloride
Tetrachloroethene	Tetrachloroethene
1,1,1-Trichloroethene	1,1,2-Trichloroethene
Ethylbenzene	Trichloroethene
Styrene	Benzene
Toluene	Vinyl Chloride
Xylenes	Bis(2-ethylhexyl)Phthalate
	Chlordane
	Acetone
	Cadmium
	Copper
	Arsenic

4.0 REMEDIAL ACTIONS

The EPA documented the selected final cleanup remedy for OU-1 in a record of decision (ROD) on September 30, 1993 (US EPA, 1993a). A remedy for OU-2 has not yet been selected. The RI/FS for OU-2 is proceeding under an Administrative Order on Consent whereby investigations are undertaken by a Potentially Responsible Party (PRP) Group with Agency oversight. A draft RI report (Arcadis, 2007) for OU-2 has been submitted that is undergoing a detailed technical review by EPA and the State.

4.1 Remedy Selection for OU-1

The following RAOs identified in the OU-1 ROD were developed because of data collected during the RI and the alternatives evaluated in the FS (ABB-ES, 1993):

- Minimize/mitigate the mass of contaminants at the source.
- Prevent further migration of contaminants from the sources to potential receptors and downgradient areas including the Blackstone River.
- Prevent ingestion of/contact with groundwater containing carcinogens at levels in excess of maximum contaminant levels (MCLs) and a total excess cancer risk of greater than $1x10^{-4}$ to $1x10^{-6}$.
- Prevent ingestion of/contact with groundwater contaminated with non-carcinogens at levels greater than MCLs, health-based ARARs, and a total hazard index greater than 1.
- Restore the contaminated groundwater in the aquifer, from the source to the outer boundary of the contaminant plumes, to a level protective of human health and the environment as soon as practicable.
- Prevent the leaching of contaminants from the soil that would result in groundwater contamination in excess of the noted health and risk-based ARARs, and
- Ensure a coordinated remediation between all points of source contamination, such that restoration of OU-1 is achieved as soon as practicable.

The goal of the remedial action at OU-1 is to restore groundwater to its beneficial use as a potential drinking water resource. The ROD included provisions for a statutory review of the OU-1 remedy at least every five years after the initiation of the remedial action. Additionally, the ROD called for the monitoring of treatment system performance on a regular basis, the application of modifications as necessary to enhance, facilitate, and accelerate the cleanup of the contaminant plume, and the periodic re-evaluation of remedial technologies for groundwater restoration to ensure that the remedy remains protective of human health or the environment. The ROD also stated that, if following a reasonable period of system operation, it is determined that the selected remedy cannot meet cleanup levels, the US EPA may elect (or the Settling Defendants may propose) to consider contingency measures as a modification to the selected remedy.

The selected remedy is comprised of two components; enhanced source control, and management of migration. The ROD apportioned remedial actions to two areas as follows:

CCL Remediation Area:

- Excavation (manholes and catch basins)
- Capping of source area soils.

- Soil venting of source area soils.
- Source area groundwater extraction, treatment and discharge to the Publicly Owned Treatment Works (POTW) sewer.
- Downgradient area groundwater extraction with the untreated groundwater discharged to the POTW sewer.
- Natural attenuation of groundwater at the Quinnville well field.
- Institutional Controls (ICs) throughout the area.
- Environmental monitoring.

Pacific Anchor Chemical (PAC) Remediation Area (Source Area and Downgradient Area):

- Excavation and disposal of contaminated leach fields and related soils.
- In-situ oxidation treatment of the soils to reduce the mobility of the arsenic in the PAC source area.
- Natural attenuation of the PAC downgradient groundwater.
- ICs throughout the PAC remediation area to prevent use or hydrologic alteration of contaminated groundwater as well as to prevent direct exposure to contaminated soils where such exposures exceed EPA's risk range.
- Focused investigation of other potential sources of contamination in the area including installation of new monitoring well nests, and sampling and analysis of groundwater.
- Environmental monitoring (EM) to evaluate the rate and success of the remedial actions including natural processes acting on the contaminated media, to monitor the migration and reduction of contaminants in the PAC Remediation Area, and to demonstrate compliance with soil cleanup levels.

Following the ROD, the Settling Defendants agreed to perform the remedial design/remedial action (RD/RA) for OU-1 through the Consent Decree (CD) entered by the Court on December 13, 1995. The RD/RA was conducted in conformance with the ROD. (See Appendix A, Figure 1 for a depiction of OU-1 and the PAC and CCL Remediation areas).

4.2 Remedy Implementation

This section provides summaries of the implementation of each of the remedial actions (PAC Remediation Area and CCL Remediation Area) specified in the ROD. The CCL Remediation Area includes a source area and down-gradient area.

The remedial design/remedial action (RD/RA) was conducted in phases between July 1995 and July 1997 subject to approval by USEPA. The ROD called for the monitoring of treatment system performance on a regular basis with modifications as necessary to enhance, facilitate, and accelerate the cleanup of the contaminant plume. Periodic re-evaluation of remedial technologies for groundwater restoration also was stipulated to ensure that the remedy remains protective of human health and the environment. If system operation cannot meet cleanup levels, the EPA may elect (or the Settling Defendants may propose) to consider contingency measures as a modification to the selected remedy.

Additionally, the Joint Groundwater Monitoring Program (JGWMP) was established in 1995 to meet the requirement for environmental monitoring specified in the ROD. The program is conducted in accordance with the Joint Groundwater Monitoring Plan and Project Operations Plan (ENSR 1995b).

Eighteen rounds of groundwater sampling have conducted between October 1995 and May 2007 as part of the JGWMP.

4.2.1 PAC Source Area

The following long-term monitoring and maintenance activities were initiated on March 17, 1998 in accordance with the operation and maintenance (O&M) plans:

- Periodic inspection of the groundwater monitoring wells to maintain good operational condition.
- Periodic environmental monitoring in accordance with the ROD and the Project Operations Plan as part of the remedy for the PAC Source Area.
- Maintenance of the specified institutional controls for the PAC Source and Former Owens Corning portions of OU-1 in order to protect the public from hazardous substances, to monitor cleanup progress and integrity, and to assess compliance with the easements.

During the first five-year review period, excavation of Leach Fields #1 and #2 in the PAC Source Area was conducted to prevent leaching of organic compounds from contaminated soils into the groundwater and to eliminate a source of oxidizable carbon in the aquifer. Most of the former leach field areas were capped with asphalt to minimize leaching of residual carbon from vadose zone soils to the groundwater. An oxidant infiltration gallery installed at former Leach Field #1 was decommissioned in October 2004 because it was ineffective.

The report entitled *Evaluation of Technical Impracticability of Groundwater Restoration for Arsenic* (ENSR 2003) was produced in response to EPA's recommendation in the First Five-Year Review Report (US EPA 2002). The draft document provides the PAC Remediation Area parties' recommendation for a waiver based on technical impracticability of attaining the newly promulgated cleanup standard for arsenic (10-ppb) in groundwater. This issue remains under review while additional data is collected and evaluated.

4.2.2 PAC Downgradient Area

The PAC Downgradient Area is comprised of an operating warehouse and former maintenance garage. Investigation revealed residual petroleum hydrocarbons in soil at former USTs in the northwest corner of the area. Two USTs immediately upgradient of MW-306 were removed in 1992 along with approximately 50 cubic yards of soil (ABB-ES, 1993). No distinct source for chlorinated volatile organic chemicals detected in groundwater was found in the area. Monitored Natural Attenuation (MNA) was the selected remedy for CVOCs in this area. However, arsenic is also detected above the newly promulgated established cleanup standard of 10-ppb in groundwater in this area as well.

4.2.3 CCL Remediation Area

The CCL Remediation Area includes the former Peterson/Puritan facility and properties to the west and south to the Blackstone River. Long-term monitoring and maintenance activities are ongoing according to the operation and maintenance (O&M) plans. Ongoing operation and maintenance activities are:

- Source area soil venting and groundwater extraction and treatment systems
- Maintenance of the treatment systems
- Periodic inspections of the bituminous and concrete caps at the source area

- Periodic inspection of the groundwater monitoring wells
- Periodic environmental monitoring
- Implementation of all required ICs

The ROD specified excavation of manhole and catch basin sediment to remove sediments that were a continuing source of groundwater contamination. The excavations were successfully completed and the sediments are no longer a potential source of groundwater contamination.

Source area soils were capped to enhance the soil venting system operation. The SOW specified capping with concrete at the CCL tank farm and with asphalt at the former O'Toole property, although a steep slope between these areas was not capped due to minimal infiltration potential. Capping was successfully completed and guard rails and gates were installed along Martin Street to prevent unauthorized entry. Monthly inspections and access restrictions ensure that the cap is maintained.

The ROD specified an SVE system to reduce the residual VOC contamination in soil above the water table in and near the tank farm. Fourteen vapor extraction (VE) wells were installed at the CCL tank farm area, and two at the former O'Toole property. The SVE system also includes groundwater depression wells that lower the water table to expose more vadose zone soil to the VE wells. Extracted soil vapors are combined, dried, and filtered prior to reaching the blower. The vapor stream from the SVE blower is treated in the carbon adsorption system (CAS) by granular activated carbon (GAC). The GAC is regenerated on-site by passing solvent-laden steam through a condenser and separator to recover extracted solvent. Recovered solvent is stored in a solvent storage tank and ultimately transported off-site for disposal. Groundwater from the groundwater depression wells is pumped to the GWTS and is treated by the groundwater air stripper system. Vapor from the air stripper is combined with the soil vapors prior to introduction to the CAS.

The remedy allows for capture and treatment of groundwater within and immediately downgradient of the source area, and for prevention of migration of contaminated groundwater from the source area. The GWTS has been in operation since June 12, 1997. Groundwater extraction wells EW-1, EW-2, and EW-3 are located on the former O'Toole Property, east of the railroad tracks. Groundwater extraction wells EW-4, EW-5, and EW-6 are located in the CCL tank farm. Excess treated water is discharged to the POTW via the NBC sewer system. Air stripper off-gas is treated by GAC in the CAS. The source area groundwater extraction system (including operation and maintenance activities Narragansett Bay Commission (NBC) discharges) is functioning in accordance with design specifications.

The seven downgradient wells, EW-7 through EW-13, associated piping, utilities, central metering vault, and individual well vaults were installed in 1996. In response to inundation of the well vaults during Blackstone River flooding, the underground electrical systems were removed from the well vaults and reinstalled above grade. The downgradient area groundwater extraction wells were brought on-line in 1997 after preliminary testing. Flow rates are maintained within the limits of the NBC permit to maximize the mass removal of VOCs. The downgradient groundwater extraction system (including operation and maintenance activities and NBC discharges) is functioning in accordance with design specifications.

In the first five-year review, USEPA made recommendations to address deficiencies in achieving the RAOs specified in the ROD. In particular, institutional controls were not in place to prevent a hydrologic alteration of groundwater or exposure to soils in the CCL source area. The noted institutional controls were not yet in place during the second five-year review period.

4.3 System Operation/Operation and Maintenance at the CCL Remediation Area

As stated above in section 4.2.1, the PAC Source Area remediation system was decommissioned. The following sections describe the system operation and for the CCL Remediation Area as previously described (ENSR 2007). A process flow chart for the GWTS and SVE systems is presented in Appendix A, Figure 6 to aid the discussion.

4.3.1 SVE System

The SVE system monitoring for extracted airflow rate, vapor phase VOC concentration, air temperature, and applied vacuum at each well is performed on a monthly basis by ENSR. Data is compiled into the site-specific treatment system database to produce tables and graphs for data interpretation.

Typical of any SVE system, maintenance has resulted in occasional downtimes. EPA and RIDEM have been notified immediately of any downtimes longer than 48 hours. A meter indicating that the system has been operational an average of 81% of the time (including the approximately three-month period when the SVE system was shut down for carbon vessel replacement) during the period of this review. Measurements of extracted airflow rate, vapor phase VOC concentration, air temperature, and applied vacuum are made at each SVE well on a monthly basis. The VOC measurements are currently made with a photoionization detector (PID). Mass removal rates for the SVE system are calculated for each well and the results are summed to obtain the overall mass rate for that day.

Figure 7 (Appendix A) shows SVE system mass removal rates from July 2000 through December 2006. As this figure indicates, VOC mass removal has been relatively constant around 900 pounds per month with the exception of occasional spikes. These spikes are not regarded as consistent with normal mass removal rates and may be due to moisture interference affecting the system PID readings. As Figure 7 (Appendix A) shows, the total mass removed by the SVE system between July 2000 and December 2006 is approximately 120,000 pounds (based on estimated average monthly rates). The consistent rate of mass recovery indicates that the SVE system continues to remove mass from the source area as designed.

The SVE system blower discharge vapor stream and the effluent vapor stream from the CAS are also measured monthly. Vapor stream measurements are made to confirm compliance with RIDEM air monitoring requirements of 95 percent or better removal of VOCs. A PID is used to monitor the CAS influent and effluent vapor phase VOC concentrations.

Overall, GAC removal efficiency has been above the 95% removal required by RIDEM regulations (RIDEM Air Pollution Control Regulation No. 9). Since the first five-year reporting period, very few monthly monitoring events showed removal below 95%. Although these events showed temporarily reduced removal efficiency, the overall (i.e., average) efficiency has been well above the 95% required efficiency since start-up. Corrective action was taken during the brief periods of reduced removal efficiency, including reducing adsorb times and changing the activated carbon.

Figure 8 (Appendix A) displays GAC removal efficiency during the current review period. This figure shows that, on average, the CAS is achieving 95% or better removal of VOCs, and therefore is in conformance with RIDEM air monitoring requirements.

Composite samples of the CAS influent and effluent vapor streams over an entire adsorb cycle were collected during the five-year review process in accordance with Conditional Test Method 011 (CTM-011). The purpose of the sampling was to verify that the CAS is meeting the required 95% vapor phase VOC concentration reduction and that VC is less than or equal to 10 parts per million by volume (ppmv) in the effluent stream. Analysis results are included in Table 3. As this table shows, the permit requirements of 95 percent VOC removal and less than 10 ppmv VC in the effluent are being achieved by the CAS.

Table 3. Air Sample Results From Carbon Adsorption System, Operable Unit 1, CCL Remediation Area, Peterson/Puritan Superfund Site, RI (ENSR 2007).

Sample Name	Total VOCs (ppmv)		Removal Efficiency	Flow Rate Per Minute (DSCFM)	Total Flow Volume (DSCF)	Emission Rate (lbs/hour)
	Inlet	Outlet				
Tank A	76.2	5.9	93%	1,393	247,898	0.17
Tank B	72.5	2.1	99%	1,407	250,315	0.02
Overall	**74.4**	**3.4**	**96%**	**1,400**	**498,213**	**0.10**

The volume of solvent recovered from the CAS, which treats vapors from the SVE and GWTS, is recorded when the solvent storage tank contents are transported off-site for disposal. The total volume recovered to date, based on shipping manifests, is 17,500 gallons. During this review period (i.e., since the First Five-Year Review), approximately 5,700 gallons of liquids were recovered by the CAS. It should be noted that the solvent recovery system was experiencing operational problems for a short period of time and some water may have been included in the solvent recovered and shipped off-site. Additionally, even when the solvent recovery system is working properly, there is some water entrained in the collected solvent.

4.3.2 Source Area Groundwater Extraction and Treatment

The GWTS is maintained by EarthTech on a routine basis. The system is checked approximately three times per week and pertinent operational parameters are recorded on log sheets. The log sheets are compiled and the data is entered into a site-specific database. The GWTS is equipped with various alarms that, depending on their severity, can initiate an outside call to the O&M technician via the integrated autodialer. The autodialer also can receive incoming calls and provide a brief status report as to the condition of the GWTS. Alarm calls are logged in the Site logbook. ENSR performs a system inspection approximately once per month. Additional maintenance activities (e.g., pump replacement, electrical control troubleshooting) are performed on an as-needed basis in order to keep the system operating at the maximum possible efficiency.

Although not a compliance standard, groundwater pumping rates are monitored to ensure capture of the plume emanating from the tank farm area. Initial modeling (ABB-ES, 1993) was performed which indicated a flow rate of 55 gpm was adequate to capture the plume from traveling downgradient, therefore, the 55 gpm flow rate was considered a target for the minimum combined flow rate of the GWTS. Figure 9 (Appendix A) shows the GWTS extraction rates during the period of the Second Five-Year Review. Based on flow totalizer data collected between July 2000 and December 2006, the GWTS flow rate averaged approximately 63 gpm. Groundwater potentiometric surface gauging measurements have consistently indicated that capture of source area groundwater has been maintained.

The main operational problem that has temporarily affected flow rates for the GWTS is iron and bacterial fouling of the GWTS components. Several measures have been taken to reduce this iron and bacterial fouling including:

- Removal and cleaning of submersible pumps and down-well piping;
- Redevelopment of EW-1, EW-2, and EW-3;
- Cleaning of lateral piping between EW-1, EW-2, and EW-3 and the treatment building;
- AquaFreed® development, pipe cleaning of EW-1, EW-2, EW-3, EW-4, EW-5, and EW-6;
- Routine acid washing of extraction wells;
- Installation of staging between the two air strippers for easier access and to facilitate cleaning;
- Installation of clean-outs on air stripper piping for periodic cleaning; and
- Installation of a bypass line on the influent manifold to reduce fouling of rotameters.

Currently, the methods used to address this problem are periodic cleaning of treatment plant piping and equipment as necessary, occasional AquaFreed® system well cleaning, and well redevelopment when well yields decline and/or when flow between the wells and the GWTS declines.

The GWTS influent and effluent streams are sampled on a monthly basis in order to ensure compliance with the NBC discharge permit (NBC, 1995 (original), 1999 (renewed), 2006 (renewed)). Narragansett Bay Commission Total Toxic Organics (NBC TTO) limits are 2.13 ppm with a single compound maximum of 1.0 ppm. Monthly self-monitoring compliance reports are submitted by Conopco to the NBC and EPA, which summarize the effluent results. As documented in the monthly status reports, GWTS effluent samples collected since 1999 (i.e., since the first five-year reporting period) have complied with the permit. Figure 10 (Appendix A) presents the monthly effluent TTO concentrations of samples collected prior to the discharge to the sewer from the GWTS. As this figure illustrates, the discharge limits have been met throughout the period of operation. Per the NBC permit, the compound cis-1,2-Dichloroethene is not subject to the TTO limits.

Air stripper off-gas is routed to the CAS, where it is commingled with the SVE stream prior to treatment via GAC. As stated previously, CAS emissions are monitored on a monthly basis with a PID. Figure 8 (Appendix A) displays GAC removal efficiency during the current review period.

4.3.3 Downgradient Area Groundwater Extraction

The downgradient well system is maintained by EarthTech on a routine basis. ENSR performs a system inspection approximately once per month. Additional maintenance activities (e.g., pump replacement, electrical control troubleshooting) are performed on an as-needed basis in order to keep the system operating efficiently.

The downgradient well system operates at a maximum flow rate of 200 gpm (per NBC permit) with all wells pumping. The flow rates from the seven extraction wells are adjusted to provide the maximum mass removal rate possible while maintaining the NBC Discharge Permit effluent limits. Flow rates are checked and recorded during routine site visits.

The downgradient well system effluent is sampled on a monthly basis in order to ensure compliance with the NBC discharge permit (NBC, 1995 (original), 1999 (renewed), 2006 (renewed)). NBC TTO limits are 2.13 ppm with a single compound maximum of 1.0 ppm. Monthly self-monitoring compliance reports are submitted by Conopco to the NBC and EPA, which summarize the effluent results. As documented in the monthly status reports submitted to the NBC, the downgradient well system has been in compliance since startup. Figure 11 (Appendix A) presents the monthly effluent

TTO concentrations of samples collected prior to the discharge to the sewer from the downgradient wells. As this figure illustrates, the discharge limits have been met throughout the period of operation. Per the NBC permit, the compound cis-1,2-Dichloroethene is not subject to the TTO limits.

4.4 Operations and Maintenance Costs

Operations and maintenance costs for the PAC remediation system that were compiled (ENSR 2007) are summarized in Tables 4, 5, and 6.

Table 4. PAC Source Area, OU-1, Annual System Operations/O&M costs – ODS and ICs.

Dates		Total Cost
From	To	
July 2000	June 2001	0
July 2001	June 2002	0
July 2002	June 2003	0
July 2003	June 2004	$10,235
July 2004	June 2005	$355,883[1]
July 2005	June 2006	$704
July 2006	May 2007	0

[1] Includes a one-time payment for establishment of contract with The Guardian Trust for long-term stewardship of institutional controls.

Table 5. Summary of O&M Costs, CCL Source Area, OU-1, Peterson/Puritan Superfund Site, RI (ENSR 2007).

2000	2001	2002	2003	2004	2005	2006	Average
$291,200	$244,400	$267,800	$304,200	$222,600	$261,900	$314,700	$272,400

4.5 Institutional Controls and Access Requirements (OU-1)

Institutional controls (ICs) are required as a component of the remedy for OU-1. Institutional controls are binding land use agreements placed on real estate in order to protect human health. For OU-1, institutional controls include prohibitions on the future use or hydrologic alteration of contaminated groundwater throughout OU-1 and prevent the direct contact or exposure to contaminated soil (within source areas). To the extent that ICs in the form of deed restrictions are required on any property for the implementation of the Consent Decree, the Settling Defendants shall use best efforts to secure and implement the ICs in accordance with the schedule agreed to by EPA. Also, for OU-1, the Consent Decree requires the Settling Defendants to provide the United States, the state, and their representatives, access at all reasonable times to OU-1 properties that are within their ownership or control. For OU-1 properties that are controlled by persons other than the Settling Defendants, the Settling Defendants are required to use best efforts to secure access agreements. In addition, the Consent Decree requires the Settling Defendants to use best efforts to obtain recorded deed restrictions ("Institutional Controls") barring activities on OU-1 properties that could interfere with the performance of the remedy.

A list identifying OU-1 properties where ICs and access agreements are required and their status is presented in Appendix B of this report. EPA's review of the progress in securing ICs and maintaining access is further discussed in section 6.8.

5.0 PROGRESS SINCE THE LAST FIVE-YEAR REVIEW

The following provides an update on progress during the latest five-year review period (2002-2007) for both OU-1 and OU-2.

5.1 Protectiveness Statement from Last Five-Year Review

The first five year review stated "The remedy for OU-1 currently protects human health and the environment in the short term because: 1) alternative water supplies are available to meet current demand, so no one is using the contaminated groundwater, and 2) all OU-1 property owners who will be subject to institutional controls are receiving, or have received, information about the institutional controls to which they will be subject. However, the remedy cannot be deemed protective in the long term until follow-up actions are taken. This is because: 1) the arsenic remedy at the PAC Remediation Area will not be able to meet the 50 ppb standard for arsenic in groundwater as specified in the ROD, let alone the new 10 ppb standard promulgated in 2002 , and 2) institutional controls are not in place at all affected properties throughout OU-1." (USEPA, 2002).

At the time of the September 2002 Five Year Review, the OU-2 remedial investigation had just begun, and therefore, protectiveness at this OU was deferred. Currently, the investigation into the nature and extent of contamination at the J. M. Mills Landfill and its surroundings is continuing. Following the completion of the RI/FS, a final cleanup remedy will be selected. It is anticipated that the RI/FS for OU-2 will be complete by 2009.

Groundwater contamination north and across the river from OU-1 has led the Agency to secure another round of groundwater (and other media) analyses from this area (which includes the Mackland Farm/Kelly House property) during 2002. This information will help EPA and RIDEM decide whether future response actions under Superfund are appropriate. Thus, this area of groundwater contamination remains in the planning stage. For the Ashton Mill Property, located on the Cumberland side of the Blackstone River, EPA no longer considers this Property to be part of the Site. Based upon a review of all available information submitted to EPA in 2002, the Ashton Mill Property does not contain contamination related to the release of hazardous substances at the Site. EPA, therefore, anticipates no need to take any additional Superfund response actions at the Property unless new information warranting further Superfund consideration or conditions not previously known to EPA regarding the Property are discovered. This determination was documented in the 2002 five year review and in subsequence correspondence to the mill owner on October 15, 2002.

5.2 Status of Recommendations and Follow-up Actions from Last Review

Table 6 lists the recommendations and follow-up actions from the last five-year review and summarizes the status of these recommendations in 2007.

Table 6. Summary of Recommendations and Follow-Up Actions from the Last 5-Year Review

Issue	Recommendations and Follow-up Actions From 2002 FYR	Party Responsible	O/S Agency	2002 Milestone Date (due by)	Affects Protectiveness ---------- Current / Future	Status as of 2007
1. Arsenic in groundwater w/in OU-1	Perform a background study for arsenic concentrations in soil (leachability) and groundwater (helps determine how localized the elevated levels of arsenic contamination are and therefore the feasibility of active cleanup measures).	PAC	EPA & RIDEM	10/1/05	N / Y	Additional information relating to evidence for spatial arsenic concentration in groundwater was obtained by PRP Groups' sampling in Summer '07, however no further assessment has been completed using newly acquired site-wide data to date; work ongoing.
	Demonstrate and provide a point of compliance boundary in OU-1 for the new 10 ppb concentration standard for arsenic in groundwater			12/31/04		Request for "Residual Zone of Arsenic in Groundwater" (by RIDEM regulations) submitted for Lonza, Inc. by ENSR in July 2003. EPA provided comment; work ongoing.
	C. Further document by modeling/monitoring the evidence for natural attenuation of arsenic in groundwater.			10/1/05		No information in consideration of MNA with respect to arsenic has been provided to date.
	D. Working in concert with the Town, determine and document the RAFLU of the Property.			12/31/03		Completed (For PAC--see Guardian Trust/IC documentation) New Purchase and sale agreement may be pending.
	E. Demonstrate and provide documentation in support of a Technical Impracticability (TI) Waiver of the Arsenic ARAR: 1. Spatial area over which a TI decision will apply. 2. Conceptual model describing Site geology, hydrology, source strength, fate and transport. 3. Evaluation of restoration potential (data and analyses that support assertion for TI waiver)			12/31/06		July 2003 report by ENSR remains under review by Agencies while additional data is obtained.
2. BTEX	A. Conduct continued groundwater monitoring of the BTEX within the south-west portion of the PAC Remediation Area to ascertain whether future response actions may be needed.	PAC	EPA & RIDEM	12/31/04	N / Y	Performed monitoring in 2007 including only PAC and CCL parcels/not including parcels west of PAC/CCL. Source concentration not expressed.
	B. Provide further trend analyses incorporating JGWMP data to resolve BTEX concentrations at the former UST location within the PAC Remediation Area.			12/31/06		Trend analysis performed by ENSR during 2007
3. CVOCs at OU-1	A. Expand the CCL/PAC well monitoring network including, but not limited to, nested (shallow/deep) wells on the Okonite property that provide vertical profiling coverage south and west of MW-307 to demonstrate the assumption that source(s) of CVOCs contamination in the PAC Downgradient Area are likely attributable to off-site non-PAC related operations. Understanding the strength of the source will allow EPA to determine whether MNA is an appropriate remedy for the PAC-downgradient CVOCs.	CCL & PAC	EPA & RIDEM	12/31/04	N / Y	Not completed.
	B. Provide further trend analyses incorporating latest JGWM data and new monitoring stations to postulate source strength and MNA for CVOCs			12/31/06		Trend analysis performed on basis of existing monitoring wells only, not new monitoring wells (ENSR 2007). Under review.
4. ICs	A. Complete and record ICs for all properties within OU-1 for which (a) there is no need for condemnation actions and (b) subordination agreements can be obtained.	CCL & PAC	EPA & RIDEM	9/30/03	N / Y	3 of some 28 properties complete; work remains in progress.
	B. Complete condemnation actions or problematic subordination agreements.			9/30/04		Work remains in progress with no known problematic issues at this time.
5. OU-2	A. Increased frequency in recreational use along the river in the vicinity of OU-2 may increase the threat of exposure to contaminated soils and sediments along the bank of the river. Increase the public's awareness through frequent notice and additional sign postings along the river until potential risks are further evaluated and physical hazards are known.	OU-2 PRP Group	EPA	3/31/03	N / TBD[1]	Signs were placed by PRP Group in Fall of '06. No maintenance provided. Lost signs were not replaced by performing party. OU-2 signage remains as an issue for public awareness/Site security. EPA conducted multiple inspections, installed locks, and will maintain signs where needed
	B. Complete the OU-2 RI/FS such that any/all potential risks are identified to the public in a timely manner and whenever possible, conduct groundwater data collection commensurate with that of OU-1.			12/31/04		Draft RI prepared in July 2007 (Arcadis, 2007). More extensive review required. One round of commensurate groundwater data completed (2007)
6. "OU-3"	Continue data review and initiate further collaborative planning to assess the need for additional response actions at OU-3.	EPA and State	----	12/31/04	N / TBD[2]	Further reviews by Agencies necessary prior to determining protectiveness.

[1] Protectiveness statement concerning OU-2 is deferred until additional data can be obtained.
[2] Protectiveness statement concerning "Potential" OU-3 is deferred until additional data can be obtained.

5.3 Partial Deletion of Superfund Site

EPA Region 1 implemented the partial deletion of a portion of the Site, owned by Macklands Realty, Inc. and Berkeley Realty, Co. (herein Macklands and Berkeley properties), from the National Priorities List (NPL). This partial deletion involved 19.8 acres originally designated within the OU-2 boundary of the Site (Figure 12, Appendix A). The properties partially deleted from the NPL are designated on the town of Cumberland Tax Assessor's Map Plat 14, Lot 2 and Plat 15, Lot 1. A Notice of Intent to Delete for these parcels at this Site was published on February 24, 2005 (70 FR 9023-9028). The closing date for comments on the Notice of Intent to Delete was March 28, 2005. EPA received no comments. The Macklands and Berkely properties are known locally as the proposed Berkeley Commons and River Run developments. The effective Date of the partial delisting was May 9, 2005. This action does not preclude the State of Rhode Island from taking any response actions under State authority, should future conditions warrant such actions.

The properties partially deleted from the NPL are designated on the town of Cumberland Tax Assessor's Map Plat 14, Lot 2 and Plat 15, Lot 1. A Notice of Intent to Delete for these parcels at this Site was published on February 24, 2005 (70 FR 9023-9028). The closing date for comments on the Notice of Intent to Delete was March 28, 2005. EPA received no comments.

5.4 Status of OU-2 since the Last 5 Year Review

The RI phase for OU-2 is currently in progress. The June 2007 Draft Remedial Investigation Report (draft RI Report) for OU-2 was submitted to the EPA. Technical review of this document is still in progress. CCL Custom Manufacturing, Inc. ("CCL") and Waste Management, are under an obligation to perform all of the work for the Remedial Investigation and Feasibility Study ("RI/FS") and Unilever Bestfoods ("Bestfoods") and Waste Management are under an obligation to finance the RI/FS at OU-2 of the Site through an October 18, 2004 Third Amendment to the Administrative Order on Consent (EPA Docket No. 1-87-1064). An update of the current investigations from the Draft RI Report is provided below (Arcadis 2007).

5.4.1 Site Background

Based on the current boundaries, the OU-2 study area is just over 1-mile-long (5,600 feet) and varies in width from approximately 1,200 to 1,900 feet, which corresponds to a total area of approximately one third of a square mile, or 200 acres. The most significant portion of the OU-2 portion of Site is the land formerly owned and operated as a landfill by Mr. Joseph Marzalkowski and his agent(s)/associates for the purposes of waste transfer and disposal (commonly referred to as the J.M. Mills Landfill). Based on a review of historical aerial photographs, the J.M. Mills Landfill reportedly accepted wastes from 1954 through the early 1980s. Other specific subareas of the study area, as defined in the Scope of Work, include the following:

- The associated Debris Fields (DFs), staging areas and suspected disposal trenches along the bank of the Blackstone River
- The gravel/paved access roads in the immediate vicinity of the study area
- The former transfer station properties (now or formerly owned by Nunes Disposal, Inc. [Nunes Parcel])
- An Unnamed Island within the Blackstone River
- A series of wetlands to the northeast of the J.M. Mills Landfill and railroad easement (referred to as A through D in the draft RI Report)

- The former Lenox Street municipal well and the former Quinnville well field (note the latter well is also included in OU-1)

5.4.2 Nature and Extent of Remedial Investigations To Date

While the entire Site has undergone a series of historical investigations, beginning as early as 1980, the majority of the RI work for OU-2 has been completed since 2003. The draft RI Report relies on this most current RI data set as a means to define the nature and extent of contamination. Since work was started in 2003, the following has been completed within OU-2 (Arcadis 2007):

- Ground surveys to provide for horizontal and vertical control of sampling locations and other key features.
- Bathymetric survey of the Blackstone River, its back channel and Pond A in 2004 to aid in determining the hydraulic profile and physical characteristics of the Blackstone River.
- Electromagnetic Induction Surveys were completed in 2003 in an effort to map out potential subsurface sources.
- Electrical conductivity/membrane interference probe survey was completed in 2003 to further evaluate levels of volatile organic compounds (VOCs) located downgradient and along the toe of the J.M. Mills Landfill.
- A geophysical survey (seismic refraction and microgravity profiling) was completed in 2005 to evaluate underground features and to help refine the shape and direction of the floor of the bedrock valley below the Site.
- Soil investigations were completed from 2003 through 2006 that included an extensive number of test trenches and soil borings with both surface and subsurface soil samples collected.
- Geotechnical soil samples were completed in 2003 to provide for a baseline for general geotechnical characteristics.
- Several phases of groundwater investigations were completed between 2003 to 2006, including installation of numerous monitoring wells and piezometers, permeability testing, water-level monitoring to assess groundwater flow gradients and direction and comprehensive groundwater monitoring.
- Sediments were sampled through a series of investigations between 2003 and 2005, including a Sediment Quality Triad (SQT) study of aquatic habitats and sediment probing completed in 2005. The SQT consisted of sediment sampling, benthic community sampling and laboratory toxicity testing. Eighty sediment samples were collected at 80 locations, including 15 locations upstream of OU-2.
- Surface-water samples were collected both in the Blackstone River and throughout some of the more significant water bodies within OU-2.
- Ecological community sampling were completed, including fish community survey, fish tissue sampling, benthic community survey, habitat delineation and assessment, a wildlife survey and a Threatened/Endangered Species and Critical Habitats Survey.
- Air medium samples were collected from the current air vents located at the J.M. Mills Landfill.

Additionally, the results of the collection and chemical analysis of fish is included in the draft RI Report. Fish were collected from (1) the Blackstone River and from several ponds within OU-2, and (2) from upstream "reference" areas of the river and a "reference" pond, where the Site would not

have contributed contaminants. This was performed in order to separately evaluate the effects of Site-based contamination from river-wide effects.

Comparison of tissue concentrations measured in fish from reference areas and from OU-2 of the Site demonstrated that fish from all areas displayed a similar distribution of chemicals. The most notable contaminants in the fish tissue include polychlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbons (PAHs), pesticides, and arsenic. Tissue concentrations varied depending on the species and chemical of interest in reference area fish and in fish from OU-2.

This testing indicated that contaminants appear to be ubiquitously present in edible resident fish in the Blackstone River and in associated ponds at concentrations that exceed health-based values for these areas tested. Therefore, based upon the results of this study alone, EPA would advise the public to minimize their consumption of resident fish from the water bodies in which these investigations were conducted until further notice is given or until further water quality improvements throughout the Blackstone River watershed are achieved. Further, additional efforts should be taken to promote a recreational "catch and release" strategy for resident fish in the river segments sampled. While the State of Massachusetts maintains a freshwater fish advisory for the Blackstone River, currently, there is no equivalent formal advisory to prevent consumption of contaminated fish along the Rhode Island river segment.

In general, white sucker had the highest concentrations of chemicals in their edible tissue; small pan fish (e.g., pumpkinseed) had the lowest chemical concentrations. Using two different fish ingestion amounts (two 8-ounce fish means/week or two 8-ounce fish meals/month), maximum and average concentrations exceeded risk-based concentrations for fish tissue. Chemicals present in fish tissue in excess of risk based concentrations assuming the higher fish consumption rate include PCBs, a number of PAHs and pesticides, bis(2-ethylheyxl)phthalate, hexachlorobenzene, arsenic, chromium, and mercury. Exceedances of risk-based concentrations assuming the lower fish consumption rate include PCBs, two PAHs, dieldrin, and arsenic. Similar exceedances were noted in fish from both the Site and the reference areas.

A Baseline Human Health Risk Assessment (HHRA) and a Baseline Ecological Risk Assessment (BERA) were also conducted as part of the RI, which remains under review. After completion and approval of the RI including determination of the nature and extent of contamination from OU-2 along with approved HHRA and BERA, the FS phase will begin for OU-2 as part of the initial remedy selection process.

In the interim, and specifically due to the increase in recreational use along the river and in the immediate vicinity of OU-2, EPA has: 1) initiated an increase in surveillance of the fenced-in portion of the Site, 2) continues to provide additional measures to increase public awareness of the potential concerns within OU-2, and 3) required additional postings at portions of the Site to deter trespassing and egress onto portions of OU-2 until the assessment of the risks are completed.

6.0 FIVE YEAR REVIEW PROCESS

This five-year review was conducted in accordance with EPA's most current five-year review guidance (USEPA 2001). Tasks completed as part of this five-year review included a review of pertinent site-related documents, interviews with parties associated or familiar with the Site, inspections of the Site, and a review of the current status of regulatory or other relevant standards.

6.1 Administrative Components

USEPA notified members of the Towns of Cumberland and Lincoln, the PRP Groups, and RIDEM were notified of the initiation of the five-year review in 2007. The second Five Year Review Team was led by David J. Newton, EPA Remedial Project Manager (RPM), and included members from USACE with expertise in geology, hydrology, biology, process engineering, and risk assessment. Louis Maccarone, RIDEM Project Manager, assisted in the review as the representative for the support agency.

In April and May 2007, the review team established the review schedule whose components included:

- Community Involvement
- Document Review
- Data Review
- Site Inspection
- Local Interviews; and
- Five-Year Report Development and Review

Inspections conducted at the Site were led by the RPM, on May 15, June 26, and June 28, 2007 and included all areas of the Site. The inspection team included engineers and scientists from the USACE, as well as the State Project Manager. The inspections included review and observations of the OU-1 treatment systems, observation of the integrity and wear of the protective bituminous and concrete caps over OU-1 source area soils, piping, manways, security, and daily operations and functionality of the remedial systems. Interviews with on-site workers and plant managers at both the CCL and PAC Remediation Areas also took place at this time, and meetings with the PRP representatives for OU-1 occurred throughout this period. The inspection team observed the OU-2 parcels, the fence line and signage for security breaches and/or trespassing. The team also inspected the Quinnville Well Field with the assistance of the Lincoln Water Commission.

6.2 Community Involvement

Recently, public interest in the Site has increased significantly. This interest is coupled with a growth of outdoor recreational facilities and outfitters along with increasing recreation users along the Blackstone River Corridor. Riverside housing developments in the last five years, such as the converted Ashton Mill warehouse, have recently attracted more residents to the river corridor. USEPA released the Peterson/Puritan Inc. Preliminary Reuse Plan in March 2002, which has sparked interest in land use and planning at the Site.

Local citizen-supported environmental groups with interests in the River, the watershed, and the heritage of the Blackstone Valley have been more attentive to the overall environmental progress and ongoing resource improvement projects taking place throughout the vicinity of the Site. A number of large-scale projects along the Blackstone River have been initiated such as:

1) The Superfund response actions;

2) Construction of the Bikeway and establishment of a canoe trail;

3) Formation of the Heritage Corridor (including National Park Service-led walking, cycling and paddling tours);

4) USACE restoration of the Lonsdale Twin Drive-in to increase wetland and flood plain habitat;

5) Development of the Central Falls Landing and the Explorer boat tours through Lonsdale Marsh, and

6) The State's initiation of three major watershed planning efforts (Total Mass Daily Limit (TMDL) study for the Blackstone River, the Blackstone River Fisheries Restoration Plan, and the Blackstone River Draft Action Plan).

These efforts have also prompted renewed interest in local activities and events such as river cleanups, sanctioned trout stocking and sport fishing, citizen storm water and river monitoring programs, and public paddling events.

Throughout this second five-year review period, no formal public meetings were held regarding the Site. However, the EPA RPM for the Site did meet with town officials for Lincoln and Cumberland on several occasions, held meetings with PRP groups, and has conducted numerous briefings for RIDEM, RIDOT, the Blackstone River Watershed Council, and the Blackstone River Valley National Heritage Corridor Commission. EPA will publish a notice of the completion of the Five-Year Review in the local paper and will distribute copies of the document to the Towns, RIDEM, and the local libraries.

6.3 Document Review

This second Five-Year Review for the entire Site consisted of a review of relevant OU-1 post construction technical and data summary documents prepared by the CCL and PAC Remediation Area Settling Defendants. This also includes but is not limited to the OU-1 remediation area-specific five year review data for both remediation area (CCL and PAC) cleanup efforts (ENSR 2007). USACE also reviewed applicable groundwater cleanup standards. A draft Remedial Investigation report for OU-2 prepared by Arcadis (2007) was also considered in respect to the whole Site review.

Assessments and plans of the Blackstone corridor were reviewed and include the following:

- Preliminary Reuse Assessment, March 2002
- Five Year Review, September 26, 2002
- Final Draft Community Relations Plan Update, Operable Unit 2, March 2003
- Ashton-Pratt Corridor Redevelopment Plan, Cumberland and Lincoln, Rhode Island, July 2004
- Blackstone River Visioning Report, October 2004
- Planning Assistance to State Programs: Blackstone River Restoration Study, November 1994
- White Paper and Case Study: Making the Case for Ecological Enhancements, January 2004
- Technical and Regulatory Guidance: Planning and Promoting Ecological Land Reuse of Remediated Sites, July 2006
- Blackstone River Watershed Reconnaissance Investigation, Volumes 1 and 2, August 1997
- Other site-related documents reviewed as part of this effort are listed in Section 12.

6.4 Review of Applicable or Relevant and Appropriate Requirements (ARARs)

Applicable or Relevant and Appropriate Requirements (ARARs) for the Site were identified in the ROD (USEPA, 1993) as follows:

- Chemical-Specific Federal Standards
  - Resource Conservation and Reclamation Act (RCRA) Identification and Listing of Hazardous Waste (40 CFR Part 261)
  - Safe Drinking Water Act (SDWA) Maximum Contaminant Level Goals
  - SDWA Maximum Contaminant Levels

- Chemical-Specific State Standards
  - Rhode Island Rules and Regulations Pertaining to Public Drinking Water (July 1991)
  - Rhode Island Rules and Regulations for Groundwater Quality (July 1993)

- Location-Specific Federal Standards
  - Protection of Wetlands Executive Order No 119900 (40 CFR Part 6)
  - Floodplain Management Executive Order Number 11900 (40 CFR Part 6)

- Location-Specific State Standards
  - Rhode Island Rules and Regulations Governing the Enforcement of the Freshwater Wetlands Ace (August 1990)

- Action-Specific Federal Standards
  - Clean Water Act (40 CFR, Part 61)
  - RCRA Air Emissions (40 CFR, Part 264)
  - RCRA General Facility (40 CFR, Subpart B 264.10264.18)
  - RCRA Preparedness and Prevention (40 CFR Part 264, Subpart C)
  - RCRA Contingency Plan and Emergency Procedures (40 CFR, Part 264, Subpart D)
  - RCRA Releases from Solid Waste Management Units (40 CFR, Part 264, Subpart F)
  - RCRA Closure and Post-Closure (40 CFR Part 264 (Subpart G)
  - RCRA Use and Management of Containers (40 CFR, Part 264, Subpart I)
  - RCRA Tanks (40 CFR, Part 264, Subpart J)
  - RCRA Miscellaneous Units (40 CFR Part 264, Subpart X, 264.600264.999)
  - RCRA Interim Status temporary storage and disposal facility (TSDF) Standards; Chemical, Physical, and Biological Treatment (40 CFR 265, Subpart Q, 265.400-265.406)
  - RCRA Land Disposal Restrictions (40 CFR Part 268)

- Action-Specific State Standards
  - Rhode Island Pretreatment Regulations (June 1984)
  - Rhode Island Underground Injection Control Regulations (June 1984)
  - Rhode Island Air Pollutions Control Regulations, Air Pollution Control Regulation No. 1, Amended 1977

- Rhode Island Air Pollutions Control Regulations, Air Pollution Control Regulation No. 7, Amended 1990
- Rhode Island Air Pollutions Control Regulations, Air Pollution Control Regulation No. 9, Amended 1993
- Rhode Island Air Pollutions Control Regulations, Air Pollution Control Regulation No. 13, Amended 1982
- Rhode Island Air Pollutions Control Regulations, Air Pollution Control Regulation No. 15, Amended 1993
- Rhode Island Air Pollutions Control Regulations, Air Pollution Control Regulation No. 17, Amended 1977
- Rhode Island Air Pollutions Control Regulations, Air Pollution Control Regulation No. 22, Amended 1992
- Rhode Island Rules and Regulations for Solid Waste Management Facilities (June 1992)
- Rhode Island Hazardous Waste Rules and Regulations, Section 8
- Rhode Island Hazardous Waste Rules and Regulations, Section 9

- Chemical-Specific "To-Be Considered" (TBC) criteria:
  - USEPA Health Assessment Documents, Acceptable Intake, Chronic and Subchronic
  - USEPA Health Assessment Cancer Slope Factors
  - USEPA Health Assessment Reference Doses
  - USEPA Office of Drinking Water Health Advisories

- Location-Specific TBC
  - None

- Action-Specific TBC
  - Control of Air Emissions from Superfund Air Strippers at Superfund Groundwater Sites (OSWER Directive 9355 0-28)
  - USEPA Region 1 Memorandum from Louis Gitto to Merrill Hohman (July 12, 1989)
  - RCRA Air Emissions Standards (40 CFR Part 264, Subpart CC)

After finalizing the 1993 ROD, on January 22, 2001 USEPA adopted a new standard for arsenic in drinking water of 10 parts per billion (ppb), replacing the old standard of 50 ppb. That rule became effective on February 22, 2002. The date by which public water systems had to comply with the updated standard was January 23, 2006, five years after the rule was established.

6.5 Toxicity and Chemical Characteristics Review

Based on examination of the EPA Integrated Risk Information System (www.epa.gov/iris) and related sources, during the last five years no changes have occurred to the toxicity values of the COCs identified in the OU-1 ROD that might affect the protectiveness of the OU-1 remedy. Note that upon attainment of the cleanup goals (i.e., drinking water standards) an updated risk assessment will be conducted for OU-1 to confirm that residual conditions are protective of human health and environment.

6.6 Data Review

The following provides a summary of the OU-1 data for each media reviewed for this second five year review.

6.6.1 Soils at OU-1

In OU-1, no additional soils were not sampled and analyzed during the review period because soils were fully addressed earlier in the investigation phase and remedial actions for soil have been undertaken as described in section 3.4.

6.6.2 Surface Water at OU-1

No additional surface water sampling occurred since the last review. In the ROD published in 1993 and the Ecological Assessment, Final Report, also published in 1993, there were reports of a least six surface water collecting station (SW 1-6) at various points along the Blackstone River that were investigated.

In the most recent Five-Year Review Report, the groundwater monitoring wells in closest proximity to the Blackstone River were sampled and the data used to project the chemical concentrations of VOC, PAH, metals, PCB's and pesticides in the Blackstone River. The logic for the replacement of chemical data from surface water stations with the groundwater wells is that they provide a "worst case scenario". In the groundwater wells closest to the Blackstone River, values for several VOCs and inorganics exceeded the respective benchmark criteria. However, dilution by river water is likely to impact actual surface water concentrations to levels below benchmark criteria.

Brook A was mentioned in the Ecological Assessment as a source of contaminants and was widely sampled in 1993. Brook A was composed of storm water drainage from above Mendon Road and cooling water from the PAC facility. With the closure of the PAC facility in 2000, Brook A became just one of many storm water inflows into the Blackstone River and is no longer recognized as a constant surface water inflow or major carrier for OU-1 source area contaminants.

6.6.3 Groundwater at OU-1

This section reviews the distribution of contaminants in OU-1 groundwater and discusses their distribution in the context of groundwater flow patterns.

OU-1 includes the PAC Remediation Area, consisting of the PAC source area and the PAC downgradient area, and the CCL Remediation Area, consisting of the source area and downgradient area. Background water level and water quality data also are available for the adjacent Owens Corning Property and a triangular parcel to the north, which are extensions of the PAC Remediation Area for purposes of groundwater monitoring and institutional controls.

Arsenic is the principal contaminant of concern in the PAC source area, but BTEX compounds and MTBE also have been detected in the southwest corner of the Downgradient Area. CVOCs also are present in concentrations that were generally less that 20 µg/L in March 2007 (Table 7).

Table 7. Recent CVOC Detections at PAC Downgradient Area, Operable Unit 1, Peterson/Puritan Superfund Site, RI (ENSR 2007)

Well	Parameter	Concentration March 2007
MW-305A	TCE	**15.5**
	cis-1,2-DCE	3.25
	1,1,1-TCA	0.5 U
MW-305B	TCE	**18**
	cis-1,2-DCE	7
	1,1,1-TCA	0.5 U
	1,1-DCA	0.27 J
MW-305C	TCE	**23**
	cis-1,2-DCE	13
	1,1-DCE	0.5 U
	Vinyl chloride	0.5 U
	1,1,1-TCA	0.25 J
	1,1-DCA	0.43 J
MW-306A	TCE	2.4
	cis-1,2-DCE	1.5
MW-306B	TCE	**13**
	cis-1,2-DCE	5.5
	Vinyl chloride	0.5 U
	1,1-DCA	0.5 U
MW-306C	TCE	**17**
	cis-1,2-DCE	9.3
	1,1-DCE	0.5 U
	Vinyl chloride	0.23 J
	1,1-DCA	0.3 J
MW-402D	TCE	3.1
	cis-1,2-DCE	1.4
MW-403D	TCE	0.58
	cis-1,2-DCE	6
	Vinyl chloride	**4.7**
	1,1-DCA	1.1
MW-404D	TCE	**11**
	cis-1,2-DCE	13
	1,1-DCE	1.7
	Vinyl chloride	**4.2**
	1,1-DCA	0.51
P-1	TCE	**12 J**
	cis-1,2-DCE	7.8
P-3	TCE	0.5 U
	cis-1,2-DCE	0.5 U

Note: Bold font indicates a concentration exceeding the PAL

Arsenic is the principal contaminant of concern in the PAC Source Area, but BTEX compounds and MTBE also have been detected in the southwest corner and in the PAC Downgradient Area. The occurrence and distribution of BTEX compounds was described in a letter from ENSR to David J. Newton on June 5, 2003, (ENSR 2007, Appendix B-2), concluding that the Mutual Gas Station (LukOil on Mendon Road northeast of the former Peterson/Puritan facility and southeast of the former PAC facility) was the most likely source of BTEX and MTBE in OU-1 well MW-302A, MW-302B, MP-2, and AD-2 (Figure 13 Appendix A). Although these wells are not directly upgradient, the possibility of migration through bedrock fractures was presented. The mechanism for transport of BTEX compounds to an apparent cross-gradient location at wells MW-302A, MW-302B, and MP-2, however, is still uncertain. The water table map in Figure 14 (Appendix A), however, may not reflect the head distribution and groundwater flow patterns in bedrock. Declines in concentrations of BTEX and MTBE since 2002 (Figure 15 Appendix A) are consistent with the removal of underground storage tanks and soils remediation at the gas station in 1998.

The ROD for OU-1 (1993) indicated that the BTEX detected in soil borings focused on Leach Field #1 (Figure 3, Appendix A), indicating an on-site source for these BTEX compounds.

MNA was selected as the remedy for CVOCs in groundwater within the PAC Downgradient Area. An analysis (ENSR 2007) indicated that geochemical conditions are appropriate for the reductive dechlorination of CVOCs, especially in deeper wells where the CVOCs are present. Concentrations of TCE and 1,1,1-TCA have declined appreciably since 1995 in wells MW-305C and P3, but no downward or upward trends are obvious since about 2000 (Figure 16). Vinyl chloride concentrations have fluctuated widely in well MW-403D over a range from nondetect to about 45-µg/L since 1996 with no obvious trends. The presence of daughter products that include cis-1,2-DCE, VC, 1,1-DCE, 1,2-DCA, ethane, ethene, and methane indicate that natural attenuation is in progress, particularly in the deeper wells. As shown in Table 8, both stable and upward trends are apparent with some CVOCs in some wells, which may be due to differing rates of reductive dechlorination (ENSR 2007).

The source of CVOC in the PAC area has not been identified. The water-table map (Figure 14 Appendix A) indicates that flow from the CCL Remediation Area is unlikely unless the contaminants are present in bedrock and groundwater flow patterns in bedrock are appreciably different from flow in the overburden. ENSR (ENSR 2007) has stated that neither the PAC Source Area nor the PAC Downgradient Area are sources for CVOCs. Because the source is not known, ENSR states that it is not possible to estimate the time necessary for CVOC remediation with certainty. Nevertheless, several assumptions by ENSR yielded a cleanup time for the PAC of 38 years from 2007. A pathway for CVOC's and BTEX compounds that has not been considered previously is vapor diffusion through coarse, unsaturated sediments and dissolution in water recharged from precipitation.

Arsenic concentrations in water from numerous monitoring wells in the PAC area exceeds the drinking water standard of 10 µg/L. The widespread occurrence of arsenic in groundwater at concentrations above 50 µg/L indicates a common and nearby cause for reducing conditions. The transport of organic carbon from the former leach field is a likely cause of reducing conditions as previously determined. The conceptual model that has been presented for arsenic in groundwater involves local geochemical processes that cause reducing conditions. The reducing conditions, in turn, dissolve arsenic that is present naturally in the rock and sediments. Although analyses for arsenic in overburden soils have not been performed recently at the PAC Source Area, analytical results for soils and bedrock at the LukOil gas station indicate that arsenic is present in both media. Elevated arsenic concentrations in water from wells near operable unit 2 (J.M. Mills landfill) (ARCADIS, 2007) further supports the concept of a natural source for arsenic in valley-fill sediments. Other Site features that could cause the mobilization of arsenic might include release of BTEX chemicals and alteration of ground-water recharge patterns such as by construction of impermeable surfaces.

The occurrence and fate of arsenic in groundwater are difficult to predict based on current knowledge about the distribution of arsenic in geologic materials and current geochemical conditions in saturated materials. Arsenic is commonly detected in water from monitoring wells in OU-1. Water from several wells in and near the PAC Source Area had concentrations that exceeded 50 µg/L in March 2007. The apparent stable concentration of arsenic (Figure 17) is consistent with results from column studies on arsenic transport reported (Stollenwerk and Colman 2004), where numerous pore volume flushes with oxygenated water were required to reduce arsenic concentrations to 10 µg/L. Furthermore, a nearly stable plume configuration is predictable on the basis of transport models for phosphorous, which has similar transport properties to arsenic (Colman, 2004; John Colman, U.S. Geological Survey, verbal communication, July 2007).

Table 8. Summary of Mann-Kendall Trend Analyses Operable Unit 1, CCL Remediation Area, Peterson/Puritan Superfund Site, RI (as reported by ENSR 2007).

Well ID	Chemical and Trend						
	PCE	TCE	1,1,1-TCA	1,1-DCE	cis-1,2-DCE	trans-1,2-DCE	Vinyl Chloride
EW-7	Downward	Stable	Downward	Downward	Downward	Downward	Downward
EW-9	Downward	Downward	Downward	Downward	Downward	Downward	Downward
EW-10	Downward	Downward	Downward	Downward	Downward	Downward	Downward
EW-11	Downward	Downward	No Trend	No Trend	Downward	No Trend	Downward
EW-12	Stable	Stable	NA	NA	Downward	NA	No Trend
GZ-2-1	Downward	Downward	Downward	NA	Downward	Downward	No Trend
MP-1	Downward	No Trend	NA	NA	No Trend	NA	NA
MP-4B	Downward	Downward	Downward	Downward	Downward	NA	NA
MP-5	Downward	Downward	Downward	NA	Downward	Downward	NA
MP-6A	Downward	Downward	Downward	NA	Downward	Downward	Downward
MP-10A	Downward	Downward	Downward	Downward	Downward	Downward	Downward
MP-10B	Downward?	Downward?	Stable	Downward	Downward	Downward	Stable
MP-10C	Downward	Downward	NA	Downward	Downward	Downward	Downward
MP-11A	Downward	Downward	Downward	Downward	Downward	Downward	Downward
MP-11B	No Trend	Downward	No Trend	Stable	Stable	Stable	Downward
MP-11C	Upward	Upward	NA	NA	Upward	Stable	Upward
MW-103	Downward	Downward	Downward	NA	Downward	Downward	Downward
MW-105B	Downward	NA	Downward	NA	Downward	NA	NA
MW-105C	Downward	Downward	Downward	Downward	Stable	Upward	NA
MW-106A	NA	NA	NA	NA	Downward	NA	NA
MW-106B	Downward	Downward	Downward	NA	No Trend	NA	NA
MW-106C	Downward	Downward	Downward	Downward	Downward	No Trend	NA
MW-201A	Upward	NA	Upward	Upward	NA	NA	NA
MW-202	Downward	NA	No Trend	NA	NA	NA	NA
MW-307	Downward	NA	NA	NA	NA	NA	NA
MW-501A	Downward	Downward	NA	Downward	Downward	Downward	NA
MW-501B	Downward	Downward	Downward	Downward	Downward	Downward	Downward
MW-501C	Downward	Downward	Downward	Stable	Stable	Downward	Downward
Well 442	Downward	Downward	Downward	Downward	Downward	No Trend	Downward

? = Trend inferred from limited sampling data.
NA = Most results non-detect; trend cannot be determined statistically.

Remedial actions to reduce arsenic concentrations included excavation and reconstruction of leach fields in the PAC source area in 1996 (ENSR 1997) to eliminate or reduce sources of organic carbon, and in-situ oxidation by an Oxidant Delivery System (ODS) near the former Leach Field #1. After three years of operation, from 1997 to 2000, it was concluded that the ODS had only a localized effect on arsenic levels in the aquifer (ENSR 2001). The ODS was decommissioned in October 2004.

A request for a technical impractibility waiver has been submitted by Lonza, Inc., to EPA (ENSR 2007, Appendix B-1). Lonza, Inc. also has applied for the establishment of a residual zone where concentrations of arsenic in groundwater could remain above the applicable groundwater quality standard in accordance with RIDEM Groundwater Regulations.

The CCL Remediation Area includes a Source Area and CCL Downgradient Area. The ROD objectives for the source area groundwater extraction and treatment system are to capture and treat groundwater within and immediately downgradient of the source area and to prevent migration of contaminated

groundwater from the source area. A second objective for three of the 6 extraction wells (EW-4, EW-5, and EW-6) is to lower the water table and expose more vadose zone soil to the vapor extraction wells.

Extraction of groundwater from 6 wells at the CCL source area has been removing contaminants at a nearly steady rate of 4-6 lbs/day (Figure 18, Appendix A), but concentrations of PCE still exceed 10,000 µg/L after 10 years of pumping. During this period, the pumping rate has been steady at about 60 gallons per minute (Figure 9, Appendix A). The cone of depression caused by pumping (Figure 14, Appendix A) has contributed to effective operation of the SVE system and appears to be containing the plume at the CCL source area in surficial materials. A mass balance calculation of possible ground-water flow into the pumped area from the upgradient contributing area, yielded a maximum inflow rate of about 60 gpm. For this calculation, a recharge rate of 26 in/yr (Randall 1996), and a contributing area of about 0.07 square miles, which was determined from the width of the plume and distance to the topographic divide, were assumed. This generalized inflow analysis supports the concept that pumping is containing the plume. A similar flow rate of 55 gallons per minute through the source area was reported (ENSR 1997, Appendix B).

Experience for many Superfund sites in New England indicates that VOCs in the source area probably have entered fractured bedrock. Limited data for bedrock at well MW-103 and MW-105C, where contaminants have been detected support this concept. It cannot be determined based on limited water-level data that pumping from the surficial materials hydraulically contains contaminants in bedrock.

The primary objective for the CCL downgradient extraction wells, as stated in the ROD, is to reduce the time required to meet groundwater standards by supplementary mass removal. The downgradient extraction system is also expected to recover the contaminant plume that migrated from the CCL source area toward the Blackstone River. Pumping from seven downgradient wells (wells EW-7 through EW-13) began in 1997, and the untreated water is discharged to the NBC sewer system. Flow rates are maintained within the limits of the NBC permit to maximize the mass removal of VOCs (ENSR 2007). The pumping rate averages about 200 gal/min; VOCs are currently removed at a rate of about 50 lbs/yr, down from about 450 lbs/yr in 1999 (ENSR 2007).

The ROD indicated a cleanup time of 6 years in the CCL Downgradient Area with source control. An analysis (ENSR 2007) extended the cleanup time to 26 years from 2007. One possible reason for this increased cleanup timeframe may be due to a larger plume area and volume than originally assumed.

Natural attenuation was specified in the OUI ROD for the Quinnville Wellfield (see Figures 1 and 4, Appendix A). Also, the ROD states that, plume concentrations downgradient of the CCL source area are expected to decrease with time by natural attenuation with aggressive source removal and control. Concentrations of total VOCs (TVOCs) in water from wells in the Quinnville Wellfield have decreased appreciably from more than 100 µg/L in 1979 to below detection limits since 2000.

The valley-fill materials consist mostly of fine to medium sand (ENSR 1998) deposited in a glacial lake with a layer of recent alluvial sand and gravel in the upper 20-30 feet. Conceptually, much of the water pumped may be from the upper coarser materials. A pumping rate of 200 gal/min is much greater than is needed to capture the contaminant plume that migrated from the source area, and induced leakage from the river is likely, as indicated by the water table map near well EW-7. One conclusion is that this pumping set up is causing excessive dilution of the contaminated water being pumped.

Elevated concentrations of VOCs persist in deep valley-fill sediments at well MP-11C (TVOC = 1,172 µg/L) and well MW-501C (TVOC = 1,016 µg/L). VOCs also are present in well MW-106C (TVOC =

8.4 µg/L). The mechanism for transport of CVOCs to the deeper overburden is not known, but a bedrock source is likely. The continued presence of contaminants at depth near the river can be attributed to a continuing source in bedrock and to limited flushing where sediments are probably less transmissive than at shallow depths and where groundwater flow lines converge (a stagnation zone). The presence of comparatively high concentrations of vinyl chloride indicates that natural attenuation is occurring in the deep sediments, but rising concentrations in well MW-11C indicate a continuing source for CVOCs. The discharge of contaminants to the river is limited because of pumping and low concentrations of contaminants in the shallow transmissive sediments. Natural attenuation in alluvial sediments near the river may also limit discharge of contaminants to the river.

The distribution of VOCs in the CCL downgradient area is consistent with the water-table map in Figure 14 (Appendix A) with the possible exception of wells in the MW-106 cluster. The water table as drawn on the figure indicates flow from the northeast rather than from the CCL Source Area to the north. The water-table contours, however, have no supporting water-level data for a large area south of the source area, and alternative interpretations are possible. Conceptually, groundwater flow is principally down-valley in the transmissive valley-fill sediments. The water-table map could be refined by considering elevations of surface-water bodies, including the Blackstone River, and the extent of saturated valley-fill sediments. For a water-table map, the contours should cross the Blackstone River at the elevation of the river rather than stopping at the river. Furthermore, the apparent cone of depression near well EW-7 would logically be shown by closed contours. Groundwater flow patterns could change with changes in river stage and thereby affect the distribution of contaminants in valley fill.

A groundwater flow model for the Site could be useful for refining the water-table map and delineate possible flow paths in areas of limited water-level data. Other applications of a model could include providing insights on possible flow paths in bedrock and testing alternative pumping schemes for optimal contaminant removal in the CCL downgradient area. A model could also support the optimization of the monitoring program.

6.7 Local Interviews and Site Inspection

The following local interviews and site inspections occurred as part of the Five Year Review. Further information concerning these activities can be found in Appendix C.

6.7.1 Interview with Town of Cumberland, RI, 6/14/07

On Thursday, June 14, representatives from the EPA, RIDEM, and USACE met with the Mayor and Department of Public Works Director for the Town of Cumberland, RI to conduct interviews in support of the Five-Year Review of the Site. Issues included the need for institutional controls (deed restrictions) at CCL and PAC sites and on the other properties surrounding OU-1, river flooding concerns at Hope Global (on the Blackstone River floodplain), ownership of J.M. Mills Property, abandoned vehicles and buildings at the Nunes parcel, and economic development along the Blackstone River.

6.7.2 Interview with Lincoln Water Commission, 6/14/07

On Thursday, June 14, representatives from the EPA, RIDEM, and USACE met with the Superintendent of the Lincoln Water Commission, to conduct interviews supporting the five-year review of the Site. Issues included the Quinnville Wellfield where the town has no current interest in reopening the wells at this time due to costs, regulatory issues, permitting, and additional labor. The Water Commission indicated the Rhode Island Department of Health has placed the wells on stand by status, and has not

plans to decommission them. Currently, the town plans to leave the wells in place (capped and placed below grade) so that the town can reopen them at a future time if necessary. There has been vandalism at the well house buildings.

6.7.3 Interview with Town of Cumberland, RI, 6/14/07

OU-2 is being investigated, including the landfill, Unnamed Island, and the former transfer station. The Lenox Street Well overlies a viable aquifer, and the town reports that this well is on standby, not abandoned, and could be returned to service at some future time. There was discussion about the Unnamed Island, including an unresolved question of ownership. The town considers the canal an important historical and recreational resource.

6.7.4 Peterson/Puritan Interview with Interest Groups, 6/19/07

Mass Audubon Society, Blackstone River Coalition, Blackstone River Watershed Council/Friends of the Blackstone and Trout Unlimited were represented. Issues included reuse of the Quinnville wells, and whether the solvent plume from OU-1 is entering the Blackstone River. EPA discussed results of fish sampling in the Blackstone River as part of the draft OU-2 RI; it was found that the fish are contaminated with PCBs, pesticides, and PAHs. The participants were interested in focusing on River corridor protection for habitat and outdoor recreation activities associated with the Blackstone River.

6.7.5 Inspection of Quinnville Wellheads, 6/19/07

The Quinnville well field and wellheads were inspected by EPA and USACE, accompanied by John Faile, the Lincoln Water Commissioner. The wellhead buildings were sealed off with fencing and welded doors, though vandalism to the fences and buildings was evident, including evidence of breaking and entering. The buildings and access roads were overgrown with dense vegetation.

6.7.6 PAC Site Inspection, 6/26/07

EPA, RIDEM, and the USACE inspected the three former leach field locations at the former PAC source area. The team inspected wells on the PAC parcel and former Owens Corning property. The team noted that well covers needed maintenance and that there is a need to maintain access to all wells.

The team inspected Dean Warehouse. Stains and small oil spills on the pavement were noted. The storm water pumps which are manually operated to pump flood waters directly back to the Blackstone River were observed.

6.7.7 CCL Treatment Facilities Inspection, 6/28/07

CCL is now owned by KIK Custom Products. The SVE/GWTS was inspected, monitoring wells were inspected and maintenance needs documented. Flow sheets for SVE/GWTS were prepared. Questions and answers were conducted between USACE (Ian T. Osgerby) and ENSR (Kevin White) concerning the GWTS operation and maintenance.

6.8 Review of Current Access Agreements and Institutional Controls (OU-1 and OU-2)

As a component of the Second Five Year Review for the Site, EPA reviewed its files concerning the status of access agreements with property owners, and assessed the OU-1 Settling Defendants' progress in implementing Institutional Controls (ICs) throughout OU-1.

In the case of OU-1, some access agreements have lapsed and must be addressed. Progress on obtaining the necessary ICs in OU-1 has been sluggish but moving forward (See Appendix B, Status of Access and Institutional Control Implementation). To date, ICs have been secured on three parcels (each within the PAC Source Area) while as many as 28 parcels remain to be secured.

In October 2004, Lonza, Inc, a major manufacturer of chemicals, and its affiliate, the Pacific Anchor Company, agreed to have the Guardian Trust (GT) assume responsibility for the long-term stewardship of their obligations at a portion of OU-1 (PAC Source Area). GT assumed responsibility for the oversight of the ICs on the parcel formerly owned by Lonza (Cumberland Plat 58, Lot 56), as well as adjacent parcels that have been impacted environmentally by historical uses (Plat 58, Lots 57 and 116, Swissline/Tony Realty, and Pawlich, respectively). The role of GT is to ensure that the required land use covenants are in place and are effective such that current and future land use does not interfere with the cleanup of the Site. GT provides a "first alert" of any problems with the controls and monitors the situation to assure any issues are identified and remedied. GT prepares annual reports based upon a review of the information gathered and provides recommendations to the parties involved.

Contamination remains on the properties within OU-1 that are overseen by GT. EPA contemplated as a component of the remedy that where contaminants remain above health-based levels, institutional controls would be required on properties that are or may potentially be affected. While institutional controls (such as the land use covenants used at OU-1) are not a permanent solution by which to solely manage exposure risks to Site contaminants, such controls when applied with other components of the remedy do provide an additional measure of protection. To date, only the PAC Source Area properties (described above) have complete ICs in place.

Prior to the submittal of the July 2007 annual report, GT conducted interviews, record reviews and property inspections in June and December 2006. Based upon these efforts, recommendations were documented. The detailed recommendations can be found in the annual report entitled "Guardian Trust 2006 Annual Inspection Report For Pacific Anchor Corporation Source Area and Former Owens Corning Parcels, Peterson/Puritan Superfund Site (NPL Listing Number RID055176283), Cumberland, Rhode Island, July 31, 2007." These recommendations are also summarized in section 8 below.

In early 2007, Unilever and CCL also acquired GT to assume responsibility for the long-term stewardship of their obligations at the CCL Remediation Area. While still in its initiation phase, contracts for title, survey, and subordination work are underway. Lastly, the Dean Warehouse property(s) (formerly owned/operated by SuperValu and also known as the PAC Downgradient Area) had elected not to use GT but to perform the necessary stewardship controls independently. To date a property survey has been completed and submitted to EPA for approval.

With respect to OU-2, paragraph 33 of the 1987 Administrative Order on Consent, as amended, requires the Respondents conducting the RI/FS to secure access for the OU-2 portion of the Site. A file review reveals that only eight of some 34 parcels may not have confirmed written access agreements currently on file with EPA. In addition, some state owned/operated parcels with current access agreements are due to

expire in July 2008. The Respondents shall maintain these access agreements throughout OU-2 to the completion of the ROD.

It is premature to consider the need for ICs within OU-2. The OU-2 ROD, when complete, will determine whether ICs may be required at OU-2. Further details on the status of Site access and ICs is summarized in Appendix B.

7.0 TECHNICAL ASSESSMENT OF REMEDIAL ACTIONS

As previously stated, the purpose of a five-year review is to evaluate whether the remedy at a site is protective of human health and the environment. In accordance with EPA's Comprehensive Five-Year Review Guidance (USEPA 2001), protectiveness is largely determined through analysis of three questions:

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

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

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

Sections 7.1 though 7.3 provide an analysis of these questions, respectively, for OU-1, thus also providing a comprehensive assessment for all remediation areas within OU-1. Section 7.4 provides the protectiveness statement for OU-1.

The remedial investigation of OU-2 is still ongoing during this five-year review; therefore, remedial action alternatives have not yet been identified. Once remedies are selected and then implemented, the five-year review technical assessment will address OU-2.

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

No. The selected remedy in accordance with the OU-1 ROD was constructed at both the CCL and PAC Remediation Areas. Currently, only the CCL Remediation Area groundwater treatment system is in full operation; where as, the PAC Source Area remediation system was decommissioned in 2004 because it was ineffective. Moreover, the projected cleanup time frames are now recognized to be considerably longer than those that were estimated in the ROD. The ROD projections were 12 years in the CCL source area; 6 years for the CCL downgradient area; six years for natural attenuation of chemicals at the PAC downgradient area; and one year for source control measures at the PAC source. After more than ten years of operation, significant amounts of contamination still exist in the ground. In addition, ICs are not yet fully implemented throughout OU-1 as described in further detail below and as presented in Appendix B.

7.1.1 PAC Source Area and Downgradient Areas

The PAC Source Area cleanup efforts were terminated in 2004. Subsequently, due to limited improvements in groundwater arsenic concentrations, a Technical Impractibility (TI) Waiver request was submitted to EPA by the OU-1 Settling Defendants.

The MNA remedy was selected for BTEX compounds and CVOCs in the PAC Downgradient Area. This remedy appears to be functioning as intended, but additional monitoring is needed to confirm trends. However, arsenic concentrations are likely to remain above the drinking water standard of 10 µg/L in much of the area into the foreseeable future.

ICs have been implemented at three out of seven parcels within the PAC Remediation Area. In at least one case, an access agreement has lapsed as noted in Appendix B herein. The Guardian Trust has been

hired by the PAC Source Area Settling Defendants to maintain the ICs currently in place whereas for the PAC Downgradient Area, these ICs are being executed independently.

7.1.2 CCL Remediation Area

For the CCL area, the remedy is functioning as designed. However, the projected cleanup times are estimated to be two to five times longer than were expected in the ROD. As stated earlier, the ROD indicated a cleanup time of 6 years in the CCL Downgradient Area with source control. An analysis (ENSR 2007) extended the cleanup time to 26 years from 2007. Contaminants that have migrated into the bedrock structure and within the base of the valley may be a potential secondary source of contamination in the valley fill deposits. This secondary bedrock source may further extend the cleanup time within the CCL Downgradient Area. Implementation of ICs throughout the CCL Remediation Area have not been completed for any of the affected parcels (approx. 20). EPA has recently approved a project plan for completing the required ICs within the CCL Remediation Area and also acquiring the Guardian Trust.

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

Yes. With few exceptions, the assumptions and conclusions used at the time of remedy selection are valid. The current exposure assumptions remain valid; however, further evaluation is needed as recreational use and development in the Blackstone River corridor continue to increase. In OU-1, the exposure routes and receptors considered in the ROD are still valid since physical conditions and operations have not changed significantly at any of the OU-1 remediation areas. Finally, no new contaminants have been identified at OU-1 that would adversely affect the remedy.

As noted previously, the interim cleanup levels selected in the ROD remain valid with the exception of arsenic. USEPA promulgated a new MCL for arsenic in January 2006 (10 µg/L) but protectiveness in the short term is not affected by the change because of the current lack of exposure due to public water availability in the area. Further, in March 2007 water samples from wells at the CCL Remediation Area were found to contain 1,4-dioxane in three out of 19 locations at a maximum concentration of 5.8 µg/L at MP-11C. Although there is no MCL for 1,4-dioxane, USEPA Regions 3 and 9 have developed a risk-based concentration for drinking water of 6.1 µg/L (based on a 1×10^{-6} cancer risk). The concentrations of 1,4-dioxane at the three locations where it was detected are below this human health-based screening value during this sampling event.

The Baseline Risk Assessment for OU-1 was conducted during the RI in 1993 (CDM 1993). As noted previously, during the last five years no changes have occurred to the toxicity values of the COCs identified in the ROD that might affect the protectiveness of the remedy. However, important changes in toxicity values are likely to accumulate over time since it appears the course of the remedy will be longer than originally expected. Further, evaluation of additional exposure pathways such as intrusive vapors into indoor spaces will need to be assessed over the next five years. To resolve the matter prior to Site closeout, the ROD specified that upon attainment of the interim cleanup goals (i.e., drinking water standards) an updated risk assessment would be conducted to confirm that residual conditions are health-protective.

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

Yes. EPA has reviewed recent information collected over the last five years by the OU-1 Settling Defendants that questions the protectiveness of the remedy over the long-term. The continued presence of VOCs in the overburden aquifer at depth, the presence of VOCs in bedrock wells near the CCL source area, and experience at numerous Superfund sites in New England indicate a likely bedrock source of contaminants migrating into the valley fill. Bedrock could continue to serve as a secondary source of contaminants after the remedy in the surficial materials within the source area is complete. Thus, the long-term protectiveness could be compromised by a potential bedrock source.

Since preparation of the ROD in 1993, considerable knowledge has been gained on the occurrence and transport of arsenic in groundwater. For example, the book "Arsenic in Ground Water" (Welch and Stollenwerk 2003) provides useful information that was not available in 1993. Information in this book and related studies in New England (Stollenwerk and Colman 2004) indicate that arsenic can be widely distributed in groundwater systems and tends to persist for a very long time after it dissolves in groundwater. Thus, natural attenuation may not be effective in either the short or long term for reducing concentrations in the OU-1 groundwater to drinking-water standards. Further MNA data collection efforts are needed.

The assumption that the concentrations of contaminants entering the Blackstone River can be determined by the concentrations of the contaminants present in groundwater from the sampling wells closest to the river should be reconsidered. Potential contamination of the river is more critical to evaluate accurately in light of the dramatic increase in recreational river use, plans for anadromous fish return to the Blackstone River, and reclassification of the river by RIDEM as Class B (1)—Impaired (RIDEM 2006) with a goal to make the river fishable and swimmable. Data from extraction wells in close proximity to the Blackstone indicate an unknown amount of groundwater containing organic solvents and metals is flowing from the deep aquifer into the Blackstone River. The assumption by ENSR (ENSR 2007) is the concentrations of contaminants present in the groundwater sampling wells when diluted in the aquifer and in the river are too low to be a concern. Recent studies on surface water – groundwater interactions (Brewster et al. 2004) report that, in PCE groundwater plumes, the sampling of the interstitial (pore) water is necessary to characterize the nature of the plumes discharging to rivers. The high concentration areas of the streambed are of ecological concern and represent areas where benthic organisms will be negatively affected. These benthic organisms play an important role in Blackstone River food chain. These data indicate there may be microhabitats within the Blackstone River affected by the intrusion of the contaminated groundwater. In addition to reestablishing numerous sampling sites in the river channel, a control site upstream of OU-1 should be added. Based on this research data, the interstitial water should also be sampled to better quantify contaminant levels potentially discharging to the river, making it possible to assess the impact of groundwater contaminants on the Blackstone River and habitat.

In addition, the remedial investigation of OU-2 is ongoing. When the RI report becomes available, it may provide additional insights with regard to the influence of contaminants originating at OU-1 upon the hydrological setting at OU-2.

7.4 Summary of the Technical Assessment

EPA remains concerned that the projected cleanup times are much longer than those that were estimated in the 1993 ROD for OU-1. Additionally, the implementation of ICs in OU-1 has progressed at a slower

pace than was anticipated. While progress on ICs have been made since the last five year review, more then 20 parcels still require completion of ICs throughout OU-1.

The exposure assumptions remain valid for all contaminants except arsenic. All assumptions may need further evaluation as recreation land use intensity increases in the future.

The continued presence of VOCs in the shallow aquifer at depth, the presence of VOCs in bedrock wells near the source, and experience at numerous Superfund sites in New England indicate a likely bedrock source of contaminants. In addition, the PCE plume may be negatively affecting human and ecological receptors in and near the Blackstone River, but pore-water data is needed to assess the impact.

8.0 ISSUES

This Five-Year Review has identified several issues listed in Table 9. These are the basis of the recommendations subsequently made in Section 9.

Table 9. Issues at the Peterson/Puritan, Inc. Superfund Site, Cumberland and Lincoln, RI.

Issues		Affects Current Protectiveness	Affects Future Protectiveness
1	Arsenic in groundwater of the PAC area remains above the drinking water standard (Table 6 Issue 1 A-E).	No—so long as groundwater is not used or consumed.	Yes—data and current technologies show trend towards not meeting groundwater cleanup standards, and ICs are not fully implemented.
2	BTEX concentrations continue to impact the PAC remediation area (Table 6 Issue 2 A and B).	No—so long as groundwater is not used or consumed.	Yes—benzene remains above drinking water standards, and ICs are not fully implemented.
3	CVOC's remain above drinking water standards at the CCL remediation area and will not meet remediation goals as described in the ROD (Table 6 Issue 3 A and B).	No—so long as groundwater is not used or consumed.	Yes—a lack of deep overburden, bedrock, pore water, and modeling data raises questions to protectiveness long term, and ICs are not fully implemented.
4	Institutional controls are not fully implemented, access agreements to many affected properties are not documented, lapsed, or have not been obtained (see Table 6 Issue 4 A and B).	Yes—effectiveness of remedy is in question.	Yes—effectiveness of remedy is in question.
5	RI/FS is not yet complete, and signage and fencing to limit exposure has not been maintained at OU-2 (Table 6 Issue 5 A and B).	Deferred	Deferred
6	The configuration of the extraction well network at the CCL downgradient area is not providing efficient removal of contaminants from groundwater.	No	Yes
7	Vapor intrusion to occupied structures is a potential concern near the source area.	Yes—due to the uncertainty of current contaminant fate and transport.	Yes—if land use changes go unmonitored or if inefficiencies in groundwater treatment allow for poor source reduction of COCs.
8	The Quinnville wellheads are not properly secured and are vulnerable to vandalism and contamination.	Yes	Yes
9	Process monitoring has not demonstrated adequate capture of contaminants during extreme ambient conditions, has not assessed the quantities of water and solvent stored, and has not given adequate consideration to 1,1,1-TCA in the soil vapor mass calculations.	Yes—stack tests may underrepresent actual emissions.	Yes—stack tests may underrepresent actual emissions.
10	Reports containing periodic monitoring data should be upgraded to meet long term monitoring remedy optimization strategies, consistent with the stated goals of the ROD.	No	Yes
11	The quality assurance project plan (QAPP) is out of date.	No	Yes
12	No ICs in place at OU-3 on Mackland Farm/Kelly House parcel(s). NOTE: Former Ashton Mill has ELUR in place as required by RIDEM Site Remediation Program. (Table 6 Issue 6)	No—current land use indicates no soil disturbance and promotes no use of groundwater.	Yes—if appropriate land use controls in the form of an ELUR is not placed in short term.

9.0 RECOMMENDATIONS AND FOLLOW-UP ACTIONS

In response to the issues noted above, recommended actions for each of the issues raised in the previous section are listed in Table 10. Further recommendations (with no specific issue) are:

1. The performance of the adsorption system should be evaluated on a hot day (such as the day of the inspection when it was 95°F) to determine whether the system is fully protective. The GAC system is cooled by ambient air after steam regeneration and comparatively little cooling occurs when the temperature differential is minimal. Some solvent vapors have a high vapor pressure, particularly vinyl chloride, possibly methylene chloride, and elevated operating temperatures may not be within the required envelope for capture by GAC adsorption of all solvents at all times. Periodic vent gas collection and analysis, in accordance with the substantive requirements of Rhode Island State Air Pollution Control Regulation Number 22 (Air Toxics), would provide such an evaluation and comparison with the PID (calibrated against an analyzed vent gas sample) would provide a means of routine evaluation.

2. A periodic check of the separation efficiency of the regeneration system that in the solvent storage tank could be by an oil/water interface probe would provide an indication of water content. The solvent storage tank provides a large volume of quiescent liquids with perhaps minimal emulsions.

3. The presumed dominance of PCE contamination at this Site may preclude a determination of the residual 1,1,1-TCA sources. The 1,1,1-TCA represents as much as 11% of the vapor flow from the SVE system. 1,1,1-TCA degrades both biotically and abiotically in the subsurface to both 1,1-DCA and 1,1-DCE which will degrade to vinyl chloride (VC) and chloroethane. The quantities of the solvents remaining at this Site, principally PCE and 1,1,1 TCA (inferred) indicate that the original quantities of solvents may be substantially greater than the known PCE tank car supply hose separation spill (17,500 gallons solvent recovered and 6,200 gallons spilled from one reported tank car incident in 1974). Daughter product distributions may indicate different pathways, perhaps even direct attenuation to unsuspected sources since PCE and/or 1,1,1-TCA degrade at different rates in different ways. Obviously 1,1-DCA only indicates the presence of the former parent compound 1,1,1 TCA and will also decay to chloroethane under appropriate circumstances.

Table 10. Recommendations and Follow-up Actions for the Peterson/Puritan, Inc. Superfund Site, Towns of Cumberland and Lincoln, State of Rhode Island.

	Issues	Recommendations and Follow-up Actions	Responsible Party	Oversight Agency	Milestone Date
1	Arsenic in groundwater of the PAC area remains above the drinking water standard (Table 6 Issue 1 A-E).	Apply state-of-the-art modeling techniques to predict the fate and transport of arsenic; analyze/describe geologic conditions, and monitor groundwater for key properties as needed to refine models. As appropriate, identify a Technical Impracticality zone based on this analysis.	PRP (PAC)	EPA/RIDEM	2009
2	BTEX concentrations continue to impact the PAC remediation area (Table 6 Issue 2 A and B).	Continue periodic monitoring of BTEX-impacted area. Apply long-term monitoring optimization approach incorporating trend analyses and MNA principles.	PRP (PAC)	EPA/RIDEM	2011
3	CVOC's remain above drinking water standards at the CCL remediation area and will not meet remediation goals as described in the ROD (Table 6 Issue 3 A and B).	Characterize the concentration and extent of CVOC's in groundwater; define ground-water flow patterns and mass fluxes to valley fill from bedrock; conduct pore water study to assess impacts to the river.	PRP (CCL)	EPA/RIDEM	2011
4	Institutional controls are not fully implemented, access agreements to many affected properties are not documented, lapsed, or have not been obtained (Table 6 Issue 4 A and B).	Implement and maintain all IC agreements on all appropriate parcels, and secure access (OU-1 and OU-2).	PRP (OU-1&OU-2)	EPA/RIDEM	2008 (access all areas) 2010 (ICs at OU-1)
5	RI/FS is not yet complete, and signage and fencing to limit exposure has not been maintained at OU-2 (Table 6 Issue 5 A and B).	Complete RI/FS. NOTE: In the interim and specifically due to the continued increase in recreational use along the river and in the immediate vicinity of OU-2, EPA has initiated the following: 1) increased surveillance of the fenced-in portion of the Site, 2) provided additional measures to increase public awareness of the potential concerns within OU-2, 3) may require additional investigations as deemed necessary, and 4) will continue to require additional postings at portions of the Site to deter trespassing and egress onto portions of OU-2 until further assessment of the risks are completed.	PRP (OU-2)	EPA/RIDEM	2009
6	The configuration of the extraction well network at the CCL downgradient area is not providing efficient removal of contaminants from groundwater.	Assess alternative technologies for removing CVOCs to reduce cleanup time. Apply borehole flow meter techniques to determine sources of water and aquifer properties at extraction wells. Apply quantitative modeling techniques to evaluate the continued value of wells for removing mass.	PRP (CCL)	EPA/RIDEM	2011
7	Vapor intrusion to occupied structures is a potential concern near the source area.	Apply models to assess the potential threat of vapor migration of site-related contaminants into occupied structures. Perform a vapor intrusion pathway assessment, if needed.	PRP (CCL)	EPA/RIDEM	2010
8	The Quinnville wellheads are not properly secured and are vulnerable to vandalism and contamination.	Work with water commission to approve a plan to secure the wellheads.	Lincoln Water Department	EPA/RIDEM	2008
9	Process monitoring has not demonstrated adequate capture of contaminants during extreme ambient conditions, has not assessed the quantities of water and solvent stored, and has not given adequate consideration to 1,1,1-TCA in the soil vapor mass calculations.	Repeat the gas vent testing at a high ambient temperature in accordance with the substantive requirements of Rhode Island State Air Pollution Control Regulation Number 22 (Air Toxics).	PRP (CCL)	EPA/RIDEM	2008 (periodic)
10	Reports containing periodic monitoring data should be upgraded to meet long term monitoring remedy optimization strategies, consistent with the stated goals of the ROD.	Analyses of monitoring data must account for extended cleanup timeframe and support of optimized long-term monitoring and remedial strategies.	PRP (CCL)	EPA/RIDEM	2010
11	The quality assurance project plan (QAPP) is out of date.	Update QAPP(s) to account for procedural changes and validity of analytical reporting limits no less than every five years.	PRP (CCL& PAC)	EPA/RIDEM	2008
12	No ICs in place at OU-3 on the Mackland Farm/Kelly House parcel(s). NOTE: Former Ashton Mill has ELUR in place as required by RIDEM Site Remediation Program. (Table 6 Issue 6)	Agency collaboration to consider options for protectiveness.	EPA/RIDEM	EPA/RIDEM	2010

9.1 Other Considerations

The following considerations, while not issues related to the protectiveness of the remedy, are pertinent to environmental management decisions.

9.1.1 Groundwater Flow Model and Optimization

Although a large quantity of hydrogeological and water chemistry data has been collected as part of characterization studies and monitoring at OU-1 and OU-2, questions remain about groundwater flow patterns, quantities, and the fate of contaminants. Specific concerns include possible down-valley components of contaminant migration from OU-1 to OU-2, groundwater flow from OU-2 beyond Pratt Dam, flow through bedrock, gains and losses in the Blackstone River, the effectiveness of pumping for contaminant containment and removal, and effects of seasonal changes in recharge rates and river stage on groundwater flow patterns. Synthesis of available hydrogeologic and water-chemical data for OU-1, OU-2, and surrounding areas through numerical ground-water flow modeling would contribute to a refined conceptual site model, which, in turn, would help identify data gaps and redundancies in the monitoring program. A flow model could also be used to evaluate alternative groundwater pumping schemes for optimum containment and extraction of contaminants and could provide the basis for contaminant transport modeling to refine estimates of cleanup times. Formulation of a depositional model for valley-fill sediments along the Blackstone River valley through the area of the Site, similar to one (Dickerman et al. 1997) for the Usquepaug-Queen River Basin in Rhode Island, would provide a strong basis for assigning hydraulic properties to the model with limited additional effort.

9.1.2 Grassland Habitat Restoration Opportunity

If capping of the OU-2 landfill is eventually required, consideration should be given to planting the landfill cap with warm season grasses and wildflowers natives to New England (see NRCS, 1998 for recommend seed mixes). Given its large size (30 acres), the Site has the potential to provide breeding habitat for grassland birds such as meadowlark, bobolink, and savannah sparrow. Planting of warm season grasses rather than cool season grasses (which are typically planted on landfills) is preferred because they provide better habitat and forage quality.

9.1.3 OU-2 Unnamed Island

Protect the island and enhance its value as a passive recreational resource and key riparian habitat node, consistent with goals of the Ashton-Pratt Redevelopment Plan.

9.1.4 Storm Water Management

Storm water from the Site is being discharged into the Blackstone River potentially resulting in further degradation of local water quality and habitat. Mitigation of untreated storm water discharges should be managed in association with the Towns' storm water phase II program.

10.0 PROTECTIVENESS STATEMENT

The USEPA Comprehensive Five-Year Review Guidance requires that the Five-Year Review include a statement on the protectiveness of the remedy (USEPA 2001). With regard to the overall Peterson/Puritan Site, remedial actions have been implemented at OU-1, initial response actions were taken, remedial investigations are underway and under review for OU-2, and at OU-3 limited actions and site assessments have been conducted leading to further planning. Protectiveness statements for each OU are presented below.

10.1 Operable Unit 1

EPA has determined as part of this five-year review that the remedy for OU-1 currently protects human health and the environment in the short term because alternative water supplies are available to meet current demand. The remedy, however, cannot be deemed protective in the long term until follow-up actions are taken. These follow-up actions include further definition of the occurrence of contaminants in bedrock, the fate and transport of contaminants, and the completion of institutional controls throughout OU-1 as identified in the first five-year review. Institutional controls are implemented at a portion of the properties located within the PAC Remediation Area and steps are being taken to implement institutional controls at the remainder of OU-1.

10.2 Operable Unit 2 and Potential Operable Unit 3

At OU-2, an investigation into the nature and extent of contamination at the J. M. Mills Landfill and its surroundings is currently underway. Until this information becomes available, the protectiveness determination for OU-2 cannot be made at this time. Lastly, the potential OU-3 remains in the planning stage. For the Ashton Mill property, located on the Cumberland side of the Blackstone River, EPA no longer considers this part of the Site.

11.0 NEXT REVIEW

Five-year reviews are conducted every five years at sites where contaminant levels remain at concentrations that prevent unlimited, unrestricted use of the Site. The next five-year review should be completed by September 30, 2012. By that time, more will be known of the progress of the groundwater cleanup at OU-1, and the nature and extent of contamination regarding other areas of concern within the boundary of the Site.

For OU-1, the next review should include a complete review of data generated under the long-term monitoring program to determine if contaminant concentration trends are consistent with those projected in the ROD. The next review should also include an evaluation of any improvements to Site access control features and the effectiveness of institutional controls for the Site once they are finalized.

The status of OU-2 will also be addressed during the next five-year review. It is anticipated that the ROD for OU-2 will be complete and remedial actions may be initiated by the time of the next review.

12.0 REFERENCES

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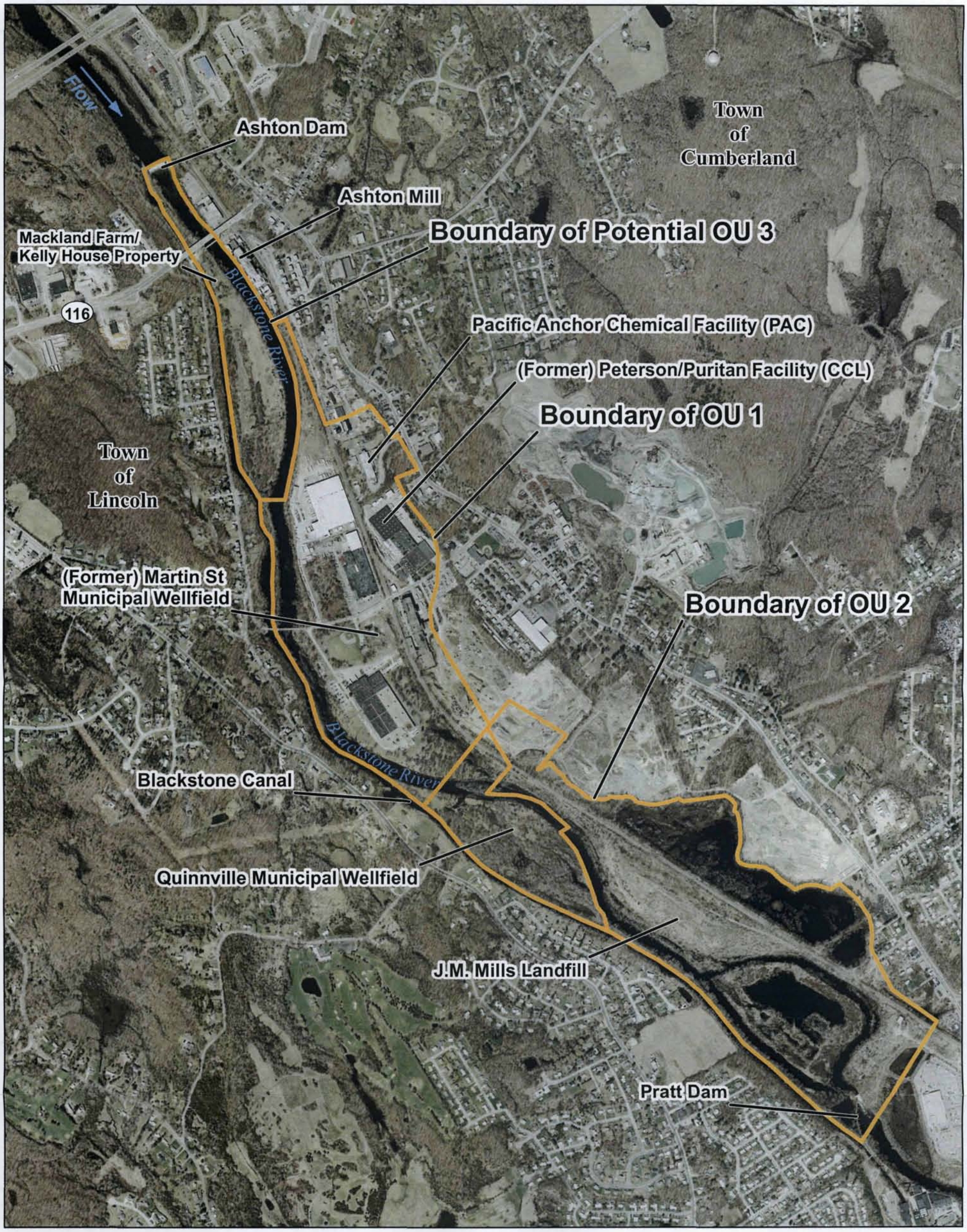
APPENDIX A - Figures

List of Figures



Notes:
1. Boundaries depicted are estimated and are for general descriptive purposes only.
2. OU1 includes the Quinnville wellfield as a receptor of OU1 groundwater contaminants.

Aerial Photo Date 4/14/03 from RIGIS

N

0 1,000 Feet

US Army Corps of Engineers
New England District

Figure 1
Location Map with Aerial Photo
Peterson/Puritan Superfund Site
Cumberland, RI

M:\Projects\Superfund\PetersonPuritan\Figures\PetersonPuritanLocationMapAerial091907.pdf
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September 19, 2007 DWN: MTW CHKD: AWB

Boundary of Potential OU-3

Boundary of OU-1

Boundary of OU-2

Pacific Anchor Chemical Facility (PAC)

(Former) Peterson/Puritan Facility (CCL)

Ashton Dam

Ashton Mill

Mackland Farm/
Kelly House Property

(Former) Martin St
Municipal Wellfield

Quinnville Municipal Wellfield

Blackstone Canal

J.M. Mills Landfill

Pratt Dam

Town of Cumberland

Town of Lincoln

Quinnville

Berkeley

Molasses Hill

Blackstone River

Monastery Brook

Water Tank

Fire Sta

Quarry

Gravel Pit

Gravel Pits

Golf Course

Cem

116

Extent of Location Map

CT

RI

Notes:
1. Boundaries depicted are estimated and are for general descriptive purposes only.
2. OU1 includes the Quinnville wellfield as a receptor of OU1 groundwater contaminants.

USGS Topographic Map Pawtucket RI-MA 1949 (Photorevised 1970 and 1979)

N

0 1,000 Feet

US Army Corps of Engineers
New England District

Figure 2
Location Map with Topographic Map
Peterson/Puritan Superfund Site
Cumberland, RI

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September 19, 2007 DWN: MTW CHKD: AWB

PAC DOWNGRADIENT AREA

Former Owens Corning Property

Leachfield #1

PAC SOURCE AREA

Pacific Anchor Co.

Leachfield #2

Leachfield #3

Dean Warehouse

CCL SOURCE AREA

KIK Customer Products

Blackstone Canal

Blackstone River

Okonite

Saylesville Properties

CCL REMEDIATION AREA

(Former) Martin St./
Municipal Wellfield

CCL
DOWNGRADIENT
AREA

Industrial Facilities Corp.
(Hope Global)

Notes:
1. Boundaries depicted are estimated and are for general descriptive purposes only.
2. OU1 includes the Quinnville wellfield as a receptor of OU1 groundwater contaminants.

Aerial Photo Date 4/14/03 from RIGIS

N

0 350
Feet

US Army Corps of Engineers
New England District

Figure 3
Operational Unit 1
Remediation Area Detail
Peterson/Puritan Superfund Site
Cumberland, RI

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September 19, 2007 DWN: MTW CHKD: AWB

Notes:
1. Boundaries depicted are estimated and are for general descriptive purposes only.
2. OU1 includes the Quinnville wellfield as a receptor of OU1 groundwater contaminants.

Aerial Photo Date 4/14/03 from RIGIS

N

0 550 Feet

US Army Corps of Engineers
New England District

Figure 4
Operational Unit 2
Site Area Detail
Peterson/Puritan Superfund Site
Cumberland, RI

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September 19, 2007 DWN: MTW CHKD: AWB

Ambient Air	Indoor and Trench Air	Groundwater	Leachate	Sediment		Surface Water		Fish	Soil	
1,2-Dichloro-1,1,2,2-tetrafluoroethane	Aroclor-1254	Aluminum	Aluminum	Aluminum	Lead	Aluminum	Mercury	Aluminum	Aluminum	Manganese
1,2,4-Trimethylbenzene	Aroclor-1260	Arsenic	Antimony	Antimony	Manganese	Arsenic	Nickel	Arsenic	Antimony	Mercury
1,2-Dichlorobenzene	2-Methylnaphthalene	Barium	Arsenic	Arsenic	Mercury	Barium	Silver	Cadmium	Arsenic	Nickel
1,3,5-Trimethylbenzene	Naphthalene	Cadmium	Barium	Barium	Nickel	Cadmium	Vanadium	Chromium	Barium	Selenium
1,3-Dichlorobenzene	Acetophenone	Chromium	Beryllium	Beryllium	Selenium	Chromium	Zinc	Cobalt	Cadmium	Silver
1,4-Dichlorobenzene	1,4-Dichlorobenzene	Iron	Cadmium	Cadmium	Silver	Cobalt	Di-n-octylphthalate	Iron	Chromium	Thallium
4-Ethyltoluene	Benzene	Lead	Chromium	Chromium	Thallium	Copper	Fluoranthene	Lead	Cobalt	Vanadium
Benzene	Carbon disulfide	Manganese	Cobalt	Cobalt	Vanadium	Cyanide	Hexachlorobenzene	Mercury	Copper	Zinc
Carbon tetrachloride	Methylcyclohexane	Nickel	Copper	Copper	Zinc	Iron	Hexachlorobutadiene	Nickel	Cyanide	Chrysene
Chlorobenzene	Tetrachloroethene	Thallium	Cyanide	Cyanide	Carbazole	Lead	Indeno(1,2,3-cd)pyrene	Selenium	Iron	Cyclohexane
Chloroethane	Toluene	Vanadium	Iron	Iron	Chrysene	Manganese	Isophorone	Vanadium	Lead	Dibenzo(a,h)anthracene
1,2-Dichloroethene	Vinyl chloride	Zinc	Manganese	1,1'-Biphenyl	Cyclohexane	4-Bromophenyl-phenylether	Phenanthrene	Benzo(a)anthracene	2-Methylnaphthalene	Dibenzofuran
Dichlorodifluoromethane	Xylene	2-Methylnaphthalene	Mercury	2-Methylphenol	Dibenzo(a,h)anthracene	4-Chloroaniline	Phenol	Benzo(a)pyrene	2-Methylphenol	Di-n-octylphthalate
Ethylbenzene		Benzo(a)anthracene	Nickel	4-Chloroaniline	Di-n-octylphthalate	4-Methylphenol	Pyrene	Benzo(b)fluoranthene	4-Bromophenyl-phenylether	Fluoranthene
Methylene chloride		Benzo(a)pyrene	Silver	4-Methylphenol	Fluoranthene	4-Nitroaniline	gamma-Chlordane	Dibenzo(a,h)anthracene	4-Chloroaniline	Hexachlorobutadiene
Toluene		Benzo(b)fluoranthene	Thallium	4-Nitroaniline	Fluorene	Acenaphthene	Heptachlor epoxide	Indeno(1,2,3-cd)pyrene	4-Methylphenol	Indeno(1,2,3-cd)pyrene
Trichloroethene		Indeno(1,2,3-cd)pyrene	Vanadium	Acenaphthene	Hexachlorobenzene	Acenaphthylene	Toxaphene	bis(2-Ethylhexyl)phthalate	4-Nitroaniline	Isophorone
Vinyl Chloride		Naphthalene	Zinc	Acenaphthylene	Hexachlorobutadiene	Acetophenone	Aroclor-1016	PCB Homologs	Acenaphthylene	Naphthalene
Xylene		Phenanthrene	Acenaphthylene	Acetophenone	Indeno(1,2,3-cd)pyrene	Benzaldehyde	Aroclor-1221	4,4'-DDD	Acetophenone	N-Nitrosodiphenylamine
		1,4-Dioxane	Benzo(a)anthracene	Anthracene	Isophorone	Benzo(a)anthracene	Aroclor-1232	4,4'-DDE	Anthracene	Pentachlorophenol
		bis(2-Ethylhexyl)phthalate	Benzo(a)pyrene	Benzaldehyde	Naphthalene	Benzo(a)pyrene	Aroclor-1242	4,4'-DDT	Benzaldehyde	Phenanthrene
		Aroclor-1242	Benzo(b)fluoranthene	Benzo(a)anthracene	N-Nitrosodiphenylamine	Benzo(b)fluoranthene	Aroclor-1248	alpha-Chlordane	Benzo(a)anthracene	Pyrene
		Aroclor-1254	Benzo(g,h,i)perylene	Benzo(a)pyrene	Pentachlorophenol	Benzo(g,h,i)perylene	Aroclor-1254	Dieldrin	Benzo(a)pyrene	Endrin ketone
		Aroclor-1248	Benzo(k)fluoranthene	Benzo(b)fluoranthene	Phenanthrene	Benzo(k)fluoranthene	Aroclor-1260	Gamma-Chlordane	Benzo(b)fluoranthene	gamma-BHC (Lindane)
		1,4-Dichlorobenzene	Dibenzo(a,h)anthracene	Benzo(g,h,i)perylene	Phenol	bis(2-Ethylhexyl)phthalate	Endrin aldehyde	Heptachlor Epoxide	Benzo(g,h,i)perylene	gamma-Chlordane
		Benzene	Indeno(1,2,3-cd)pyrene	Benzo(k)fluoranthene	Pyrene	Chrysene	Endrin ketone		Benzo(k)fluoranthene	Heptachlor epoxide
		Chlorobenzene	Naphthalene	bis(2-Ethylhexyl)phthalate	Heptachlor epoxide	Cyclohexane	gamma-BHC (Lindane)		bis(2-Ethylhexyl)phthalate	Methoxychlor
		Chloroform	Phenanthrene	Carbazole	Toxaphene	Dibenzo(a,h)anthracene	Benzene		Butylbenzylphthalate	Toxaphene
		1,2-Dichloroethene	1,1'-Biphenyl	4,4'-DDD	Aroclor-1242	4,4'-DDD	Chloromethane		Carbazole	Aroclor-1248
		Isopropylbenzene	4-Methylphenol	4,4'-DDE	Aroclor-1248	4,4'-DDE	cis-1,3-Dichloropropene		4,4'-DDD	Aroclor-1254
		Methyl tert butylether	Atrazine	4,4'-DDT	Aroclor-1254	4,4'-DDT	Isopropylbenzene		4,4'-DDE	Aroclor-1260
		Vinyl chloride	bis(2-Ethylhexyl)phthalate	alpha-Chlordane	Aroclor-1260	alpha-Chlordane	Methyl Acetate		4,4'-DDT	Isopropylbenzene
		Xylene	Dibenzofuran	Dieldrin	Isopropylbenzene	beta-BHC	Styrene		alpha-Chlordane	Methyl Acetate
			Pentachlorophenol	Endosulfan sulfate	Methyl Acetate	Dieldrin	trans-1,3-Dichloropropene		Dieldrin	Methylene chloride
			Alpha-BHC	Endrin	Methylcyclohexane	Endosulfan sulfate	Trichlorofluoromethane		Endosulfan I	Tetrachloroethene
			Dieldrin	Endrin aldehyde	Styrene				Endosulfan II	Trichlorofluoromethane
			Aroclor-1254	Endrin ketone	Trichlorofluoromethane				Endosulfan sulfate	Xylene (Total)
			Aroclor-1260	gamma-Chlordane	Acetone				Endrin	4-Methyl-2-pentanone
			1,4-Dichlorobenzene	1,1-Dichloroethene	Carbon Disulfide				Endrin aldehyde	Acetone
			Benzene	2-Butanone	Chloromethane				1,1-Dichloroethene	Carbon Disulfide
			Chlorobenzene	4-Methyl-2-pentanone	cis-1,2-Dichloroethene				2-Butanone	Chloromethane
									2-Hexanone	cis-1,2-Dichloroethene

Figure 5. Contaminants of Potential Concern at Peterson Puritan, OU-2
Peterson/Puritan Superfund Site, Cumberland, RI (ENSR, 2007)

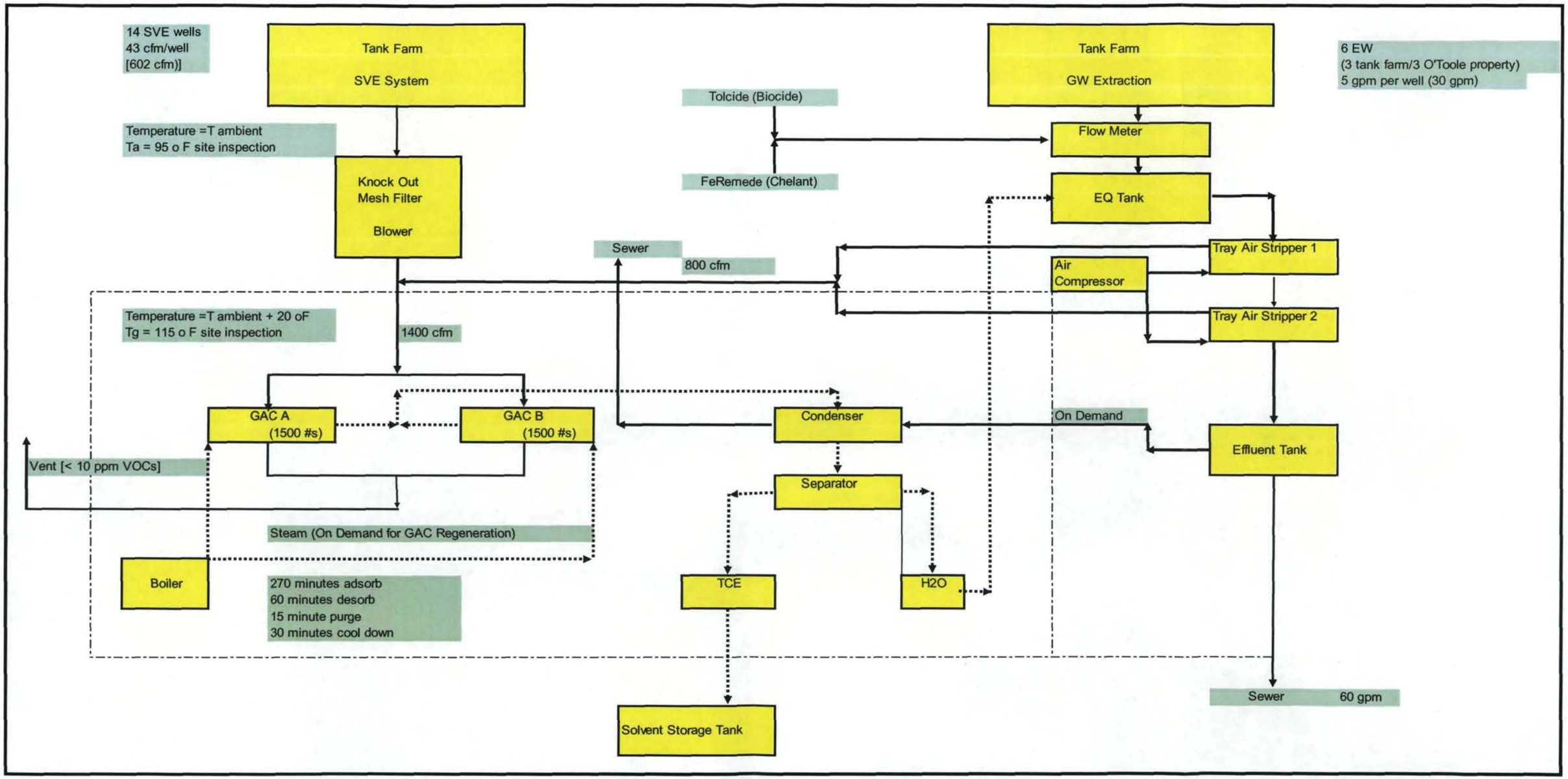


Figure 6. Peterson/Puritan Ground Water Treatment System (GWTS) Process Flow Sheet
Peterson/Puritan Superfund Site, OU-1, Cumberland, RI

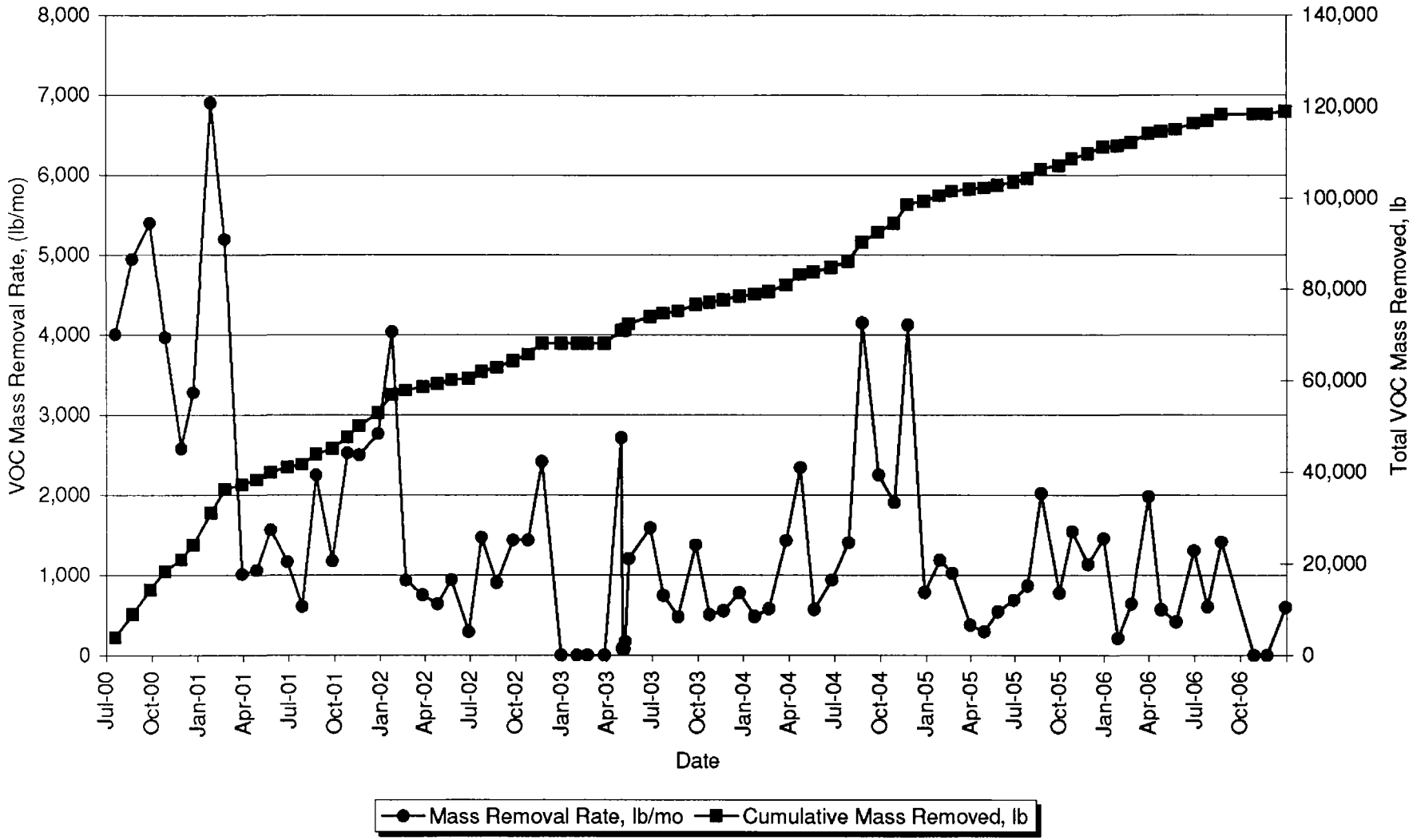
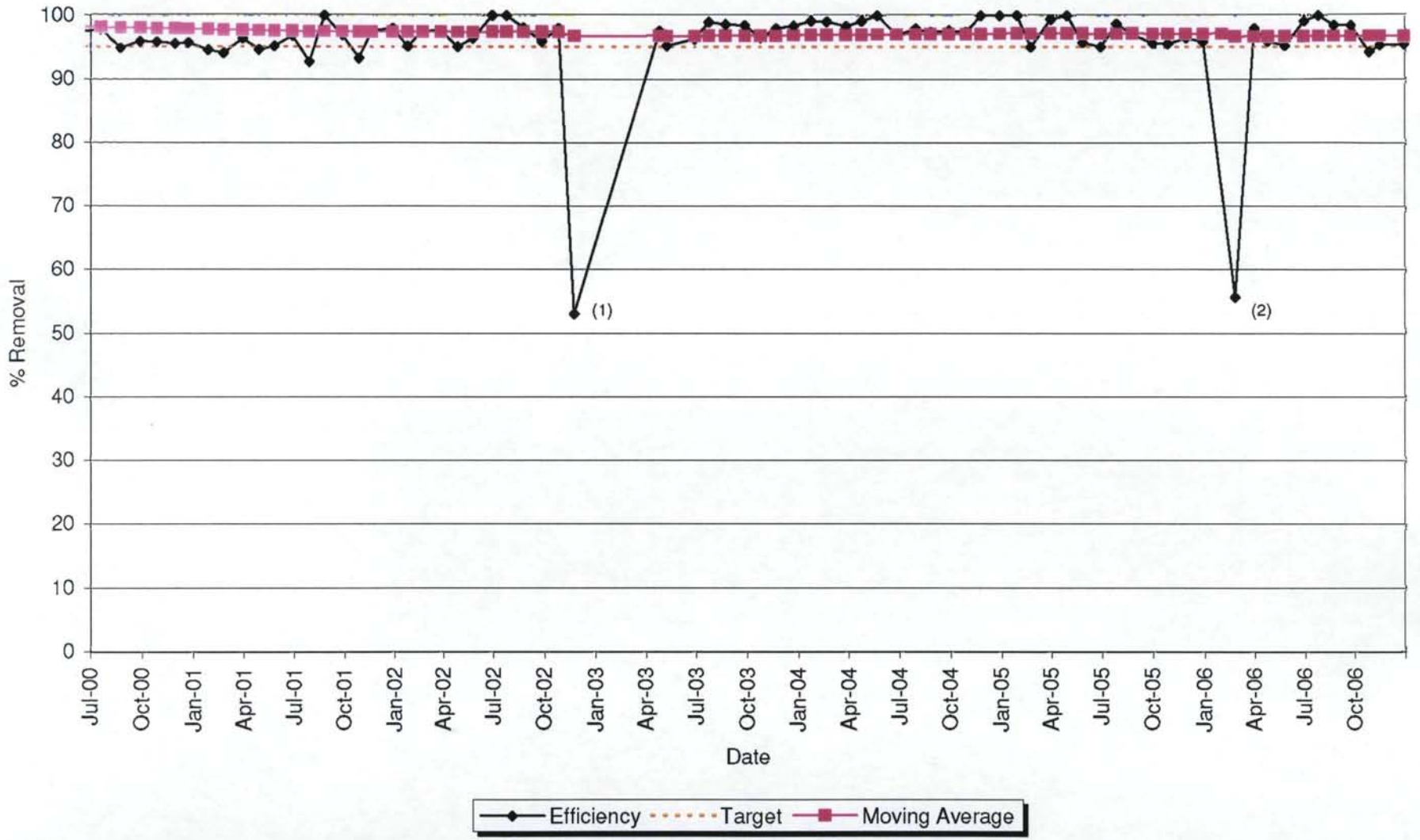


Figure 7. SVE System Mass Removal Rates CCL Remediation Area
Peterson/Puritan Superfund Site, OU-1, Cumberland, RI (ENSR, 2007)



(1) - SVE down during carbon vessel replacement
(2) - Carbon changed after testing result

Figure 8. GAC Removal Efficiency at CCL Remediation Area
Peterson/Puritan Superfund Site, OU-1, Cumberland, RI (ENSR, 2007)

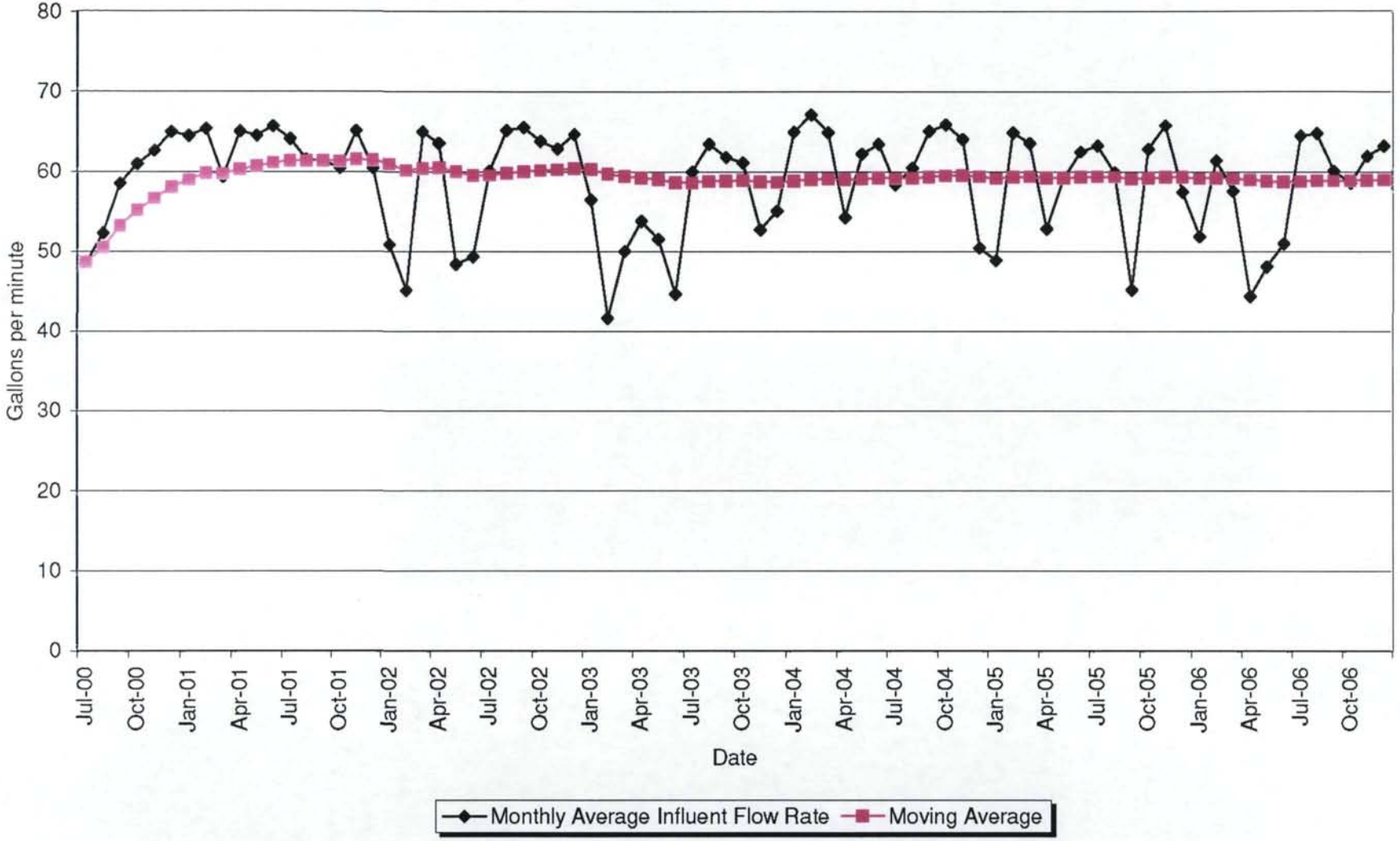


Figure 9. Groundwater Treatment System Average Month Flow Rate, CCL Remediation Area Peterson/Puritan Superfund Site, OU-1, Cumberland, RI (ENSR, 2007)

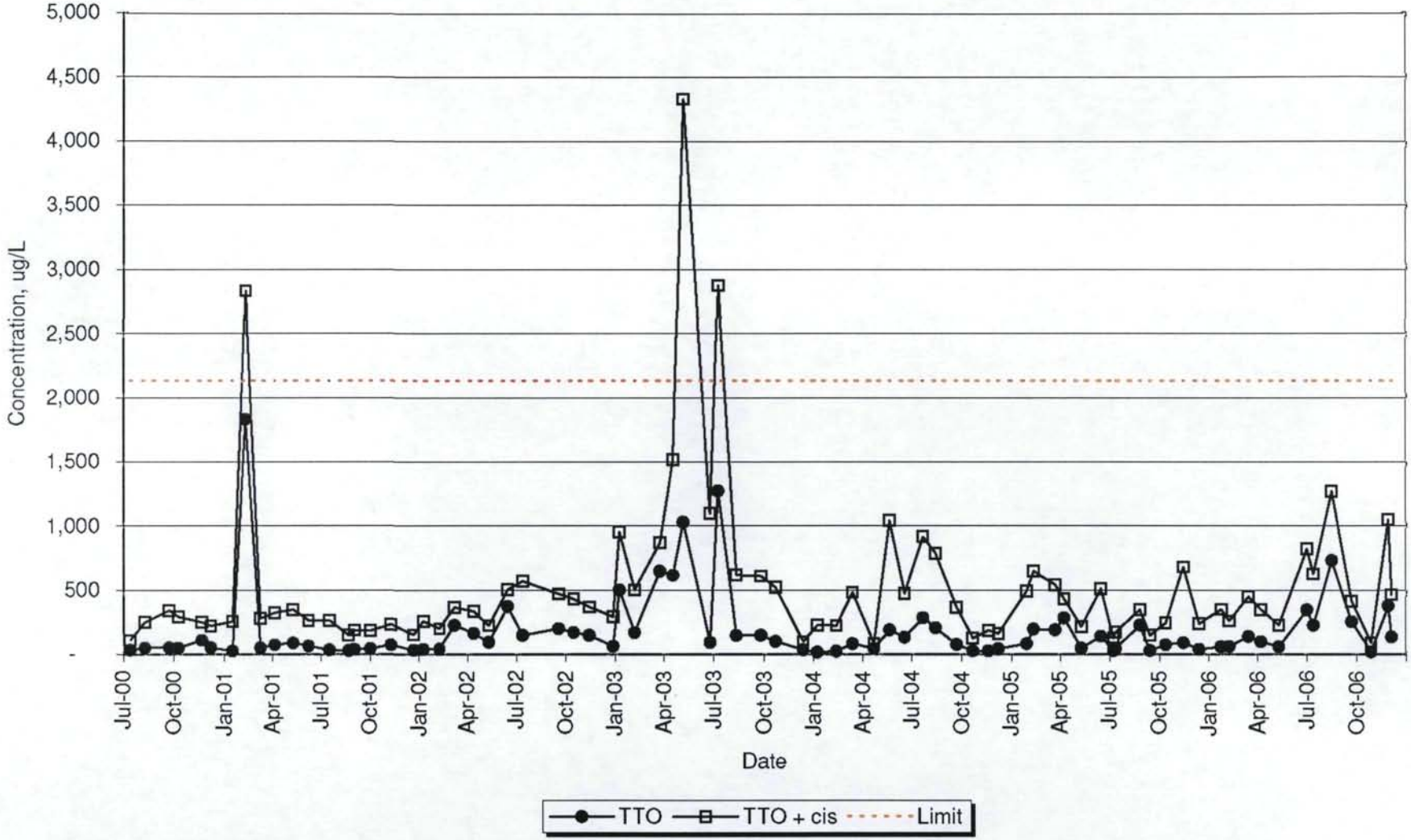


Figure 10. Groundwater Treatment System Effluent TTO Concentrations, CCL Remediation Area Peterson/Puritan Superfund Site, OU-1, Cumberland, RI (ENSR, 2007)

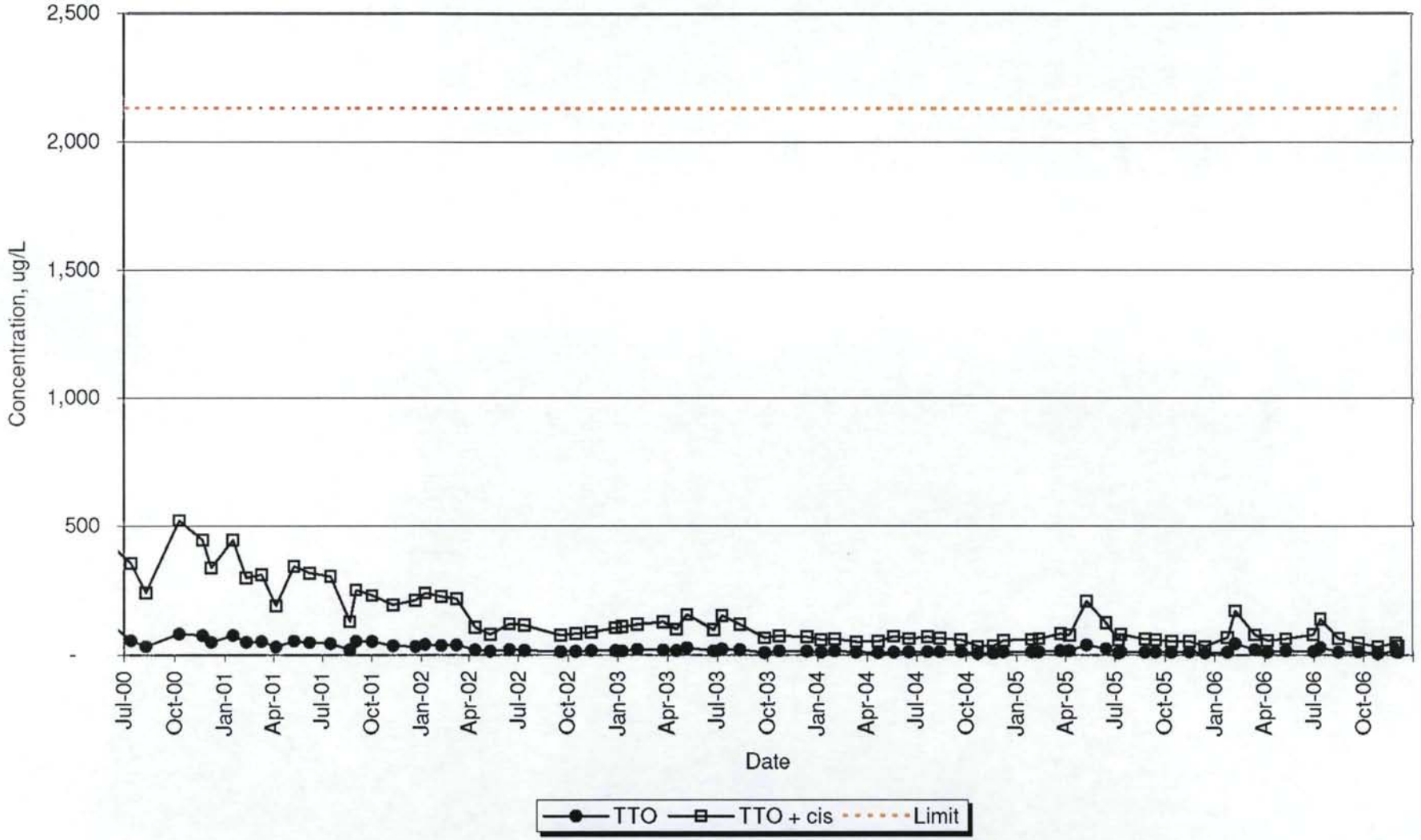


Figure 11. Downgradient Wells Effluent TTO Concentrations, CCL Remediation Area Peterson/Puritan Superfund Site, OU-1, Cumberland, RI (ENSR, 2007)

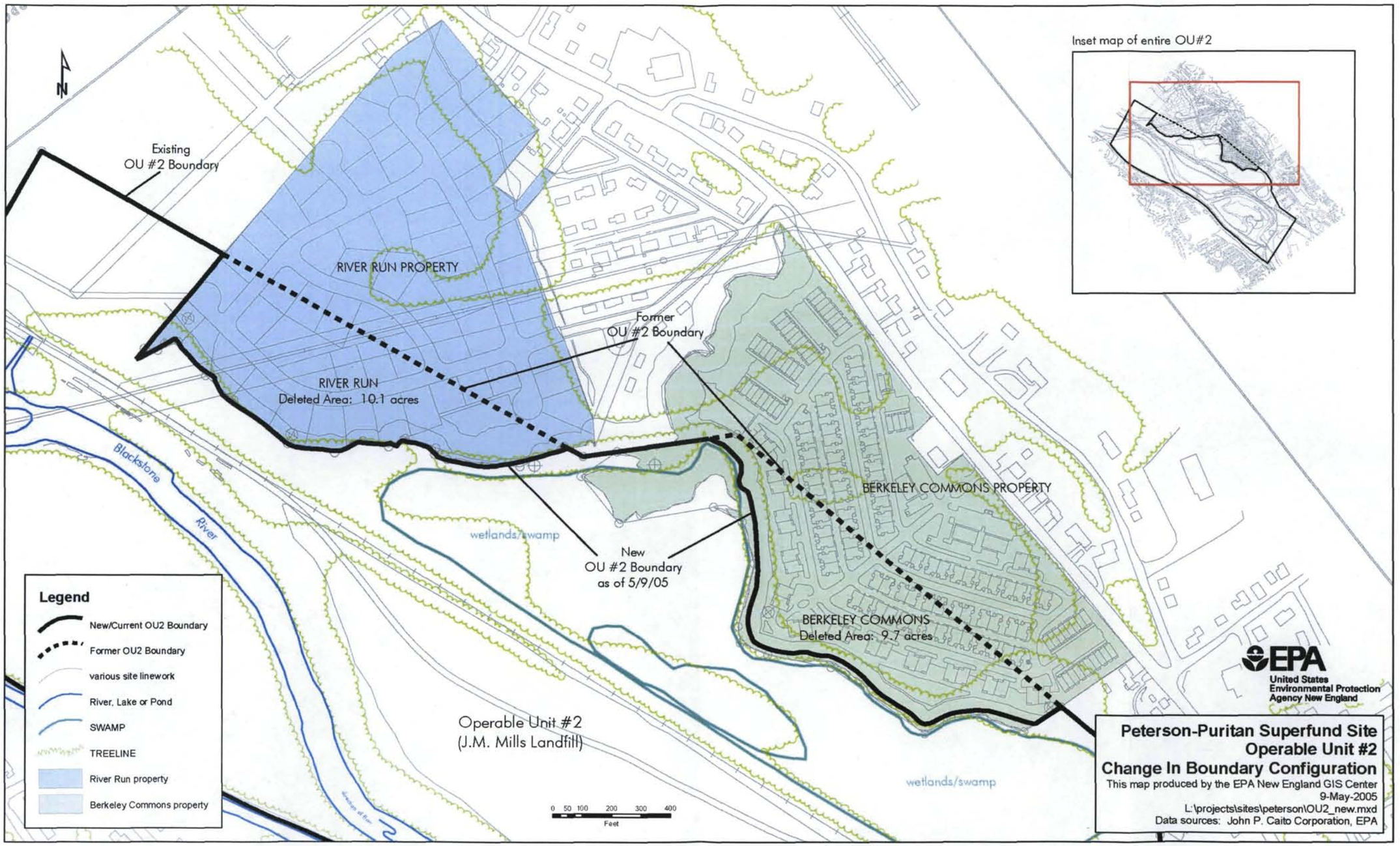


Figure 12. Change in boundary for OU-2, Peterson-Puritan Superfund Site, RI (USEPA, 2007).

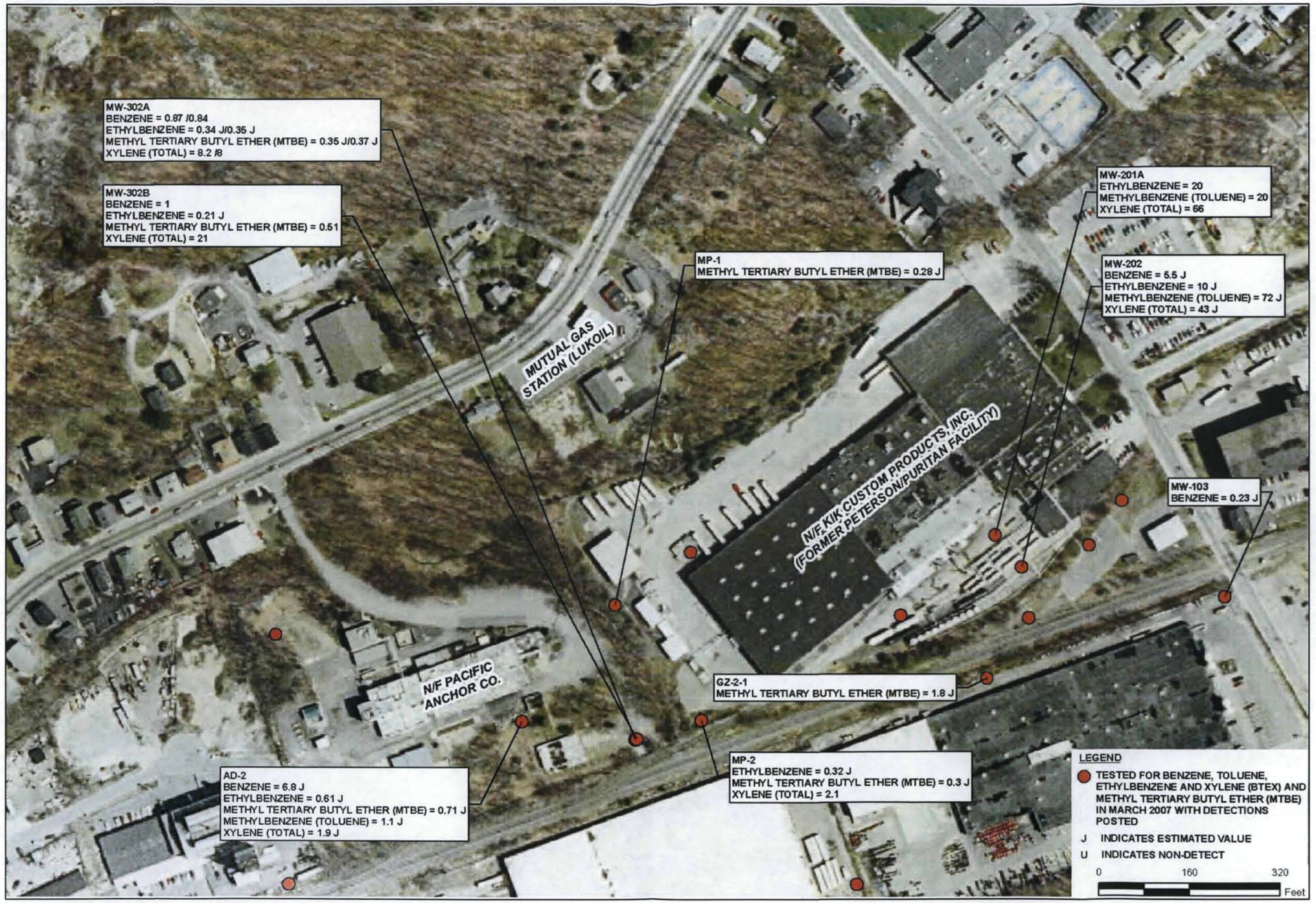


Figure 13. BTEX and MTBE Detections at OU-1, Peterson-Puritan Superfund Site, RI (ENSR, 2007).

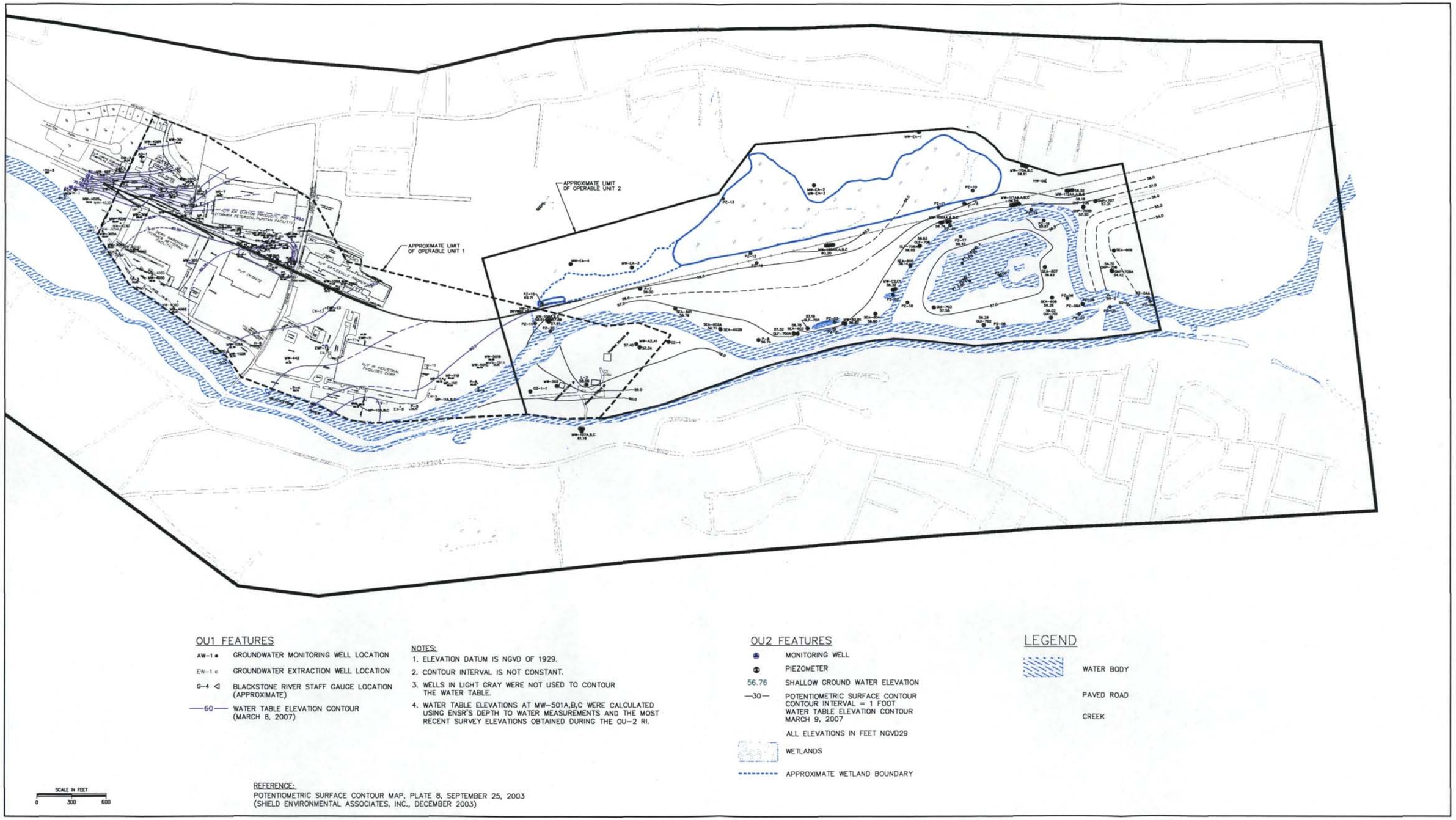


Figure 14. Water Table Contour Map, 18th Round, Peterson-Puritan Superfund Site (ENSR, 2007).

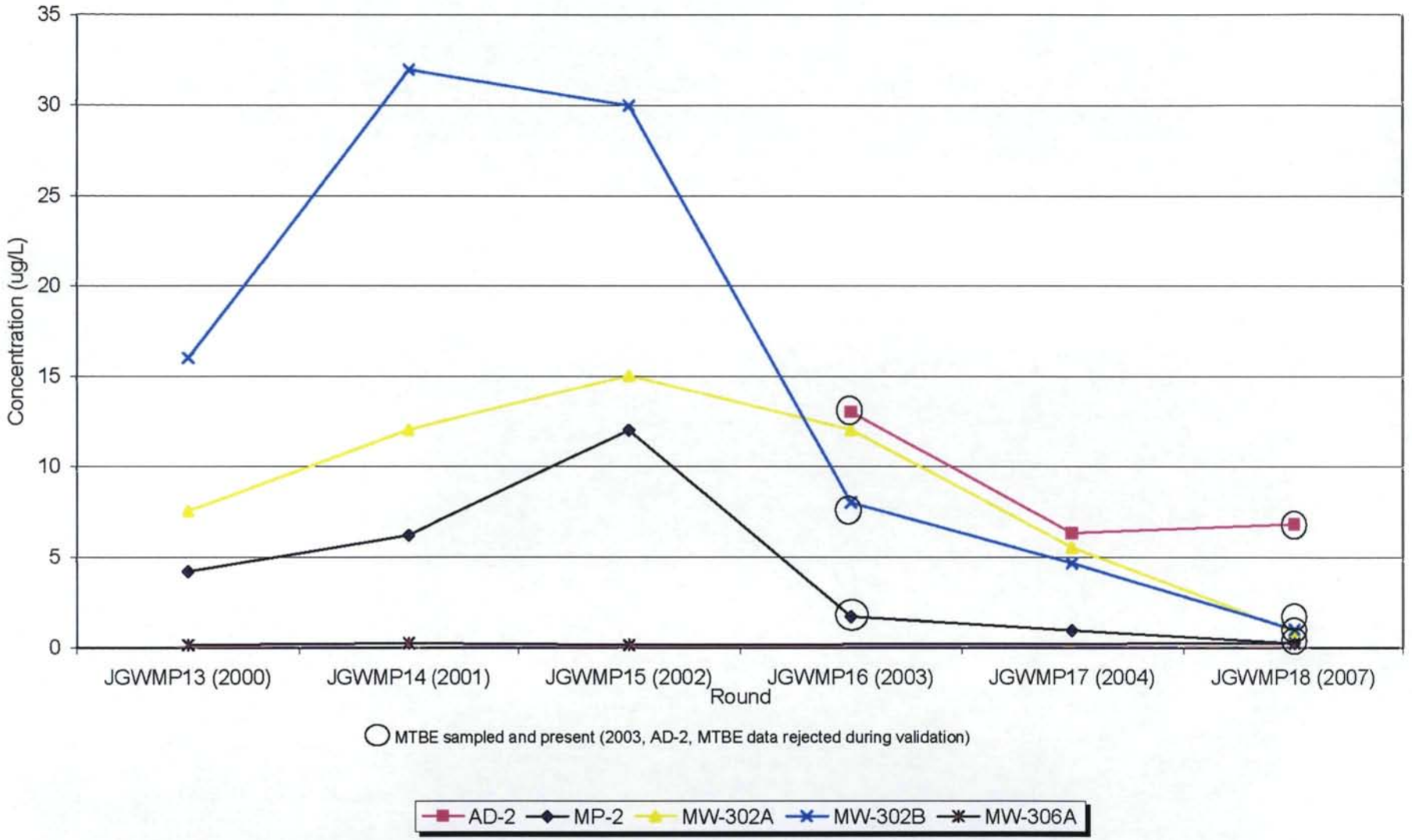


Figure 15. Benzene and MTBE Results, SW Corner Wells, PAC Source Area Peterson-Puritan Superfund Site, Cumberland, RI (ENSR, 2007).

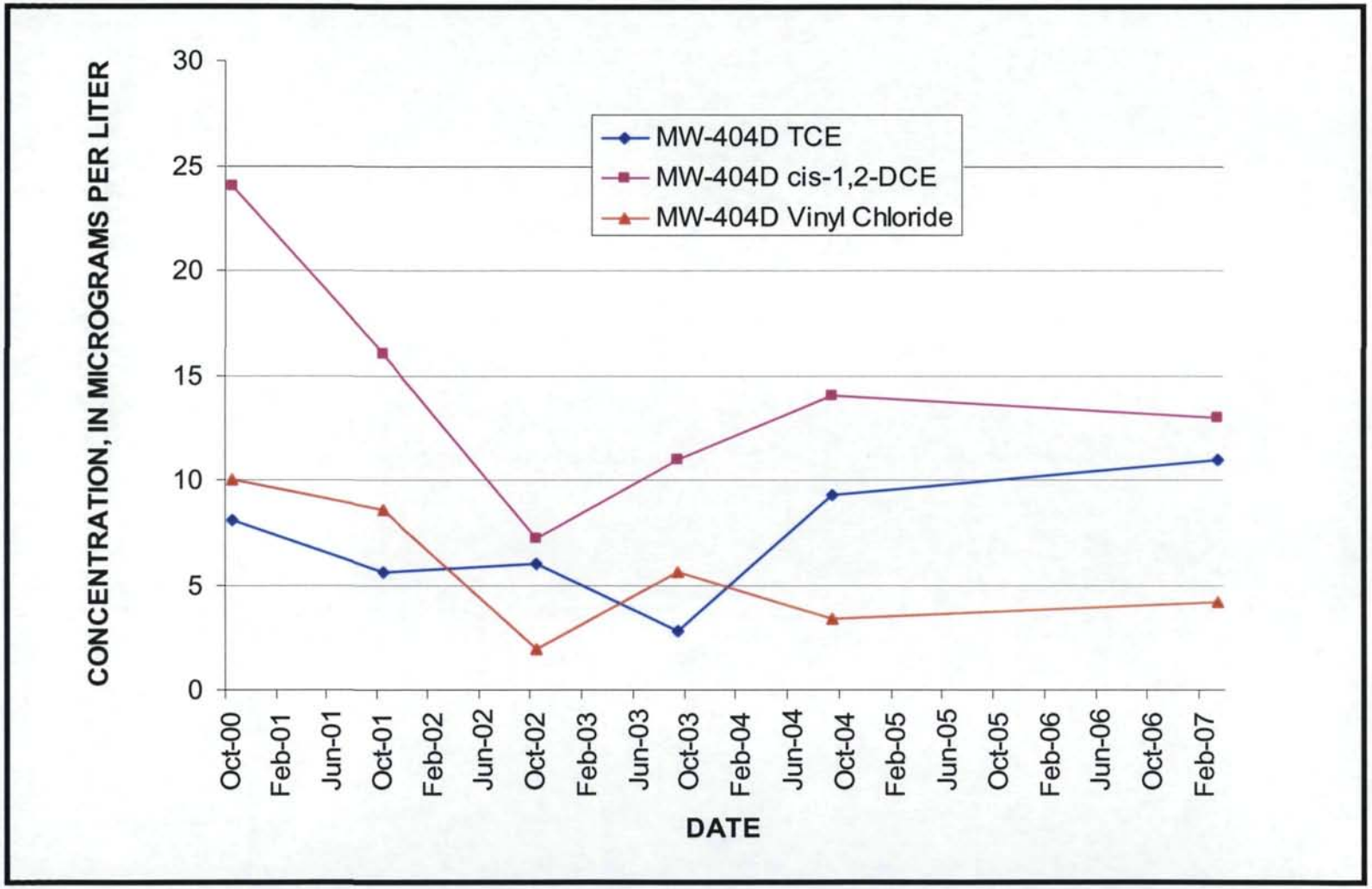


Figure 16. Concentrations of selected volatile organic compounds in well mw-404d Peterson-Puritan Superfund Site, Cumberland, RI

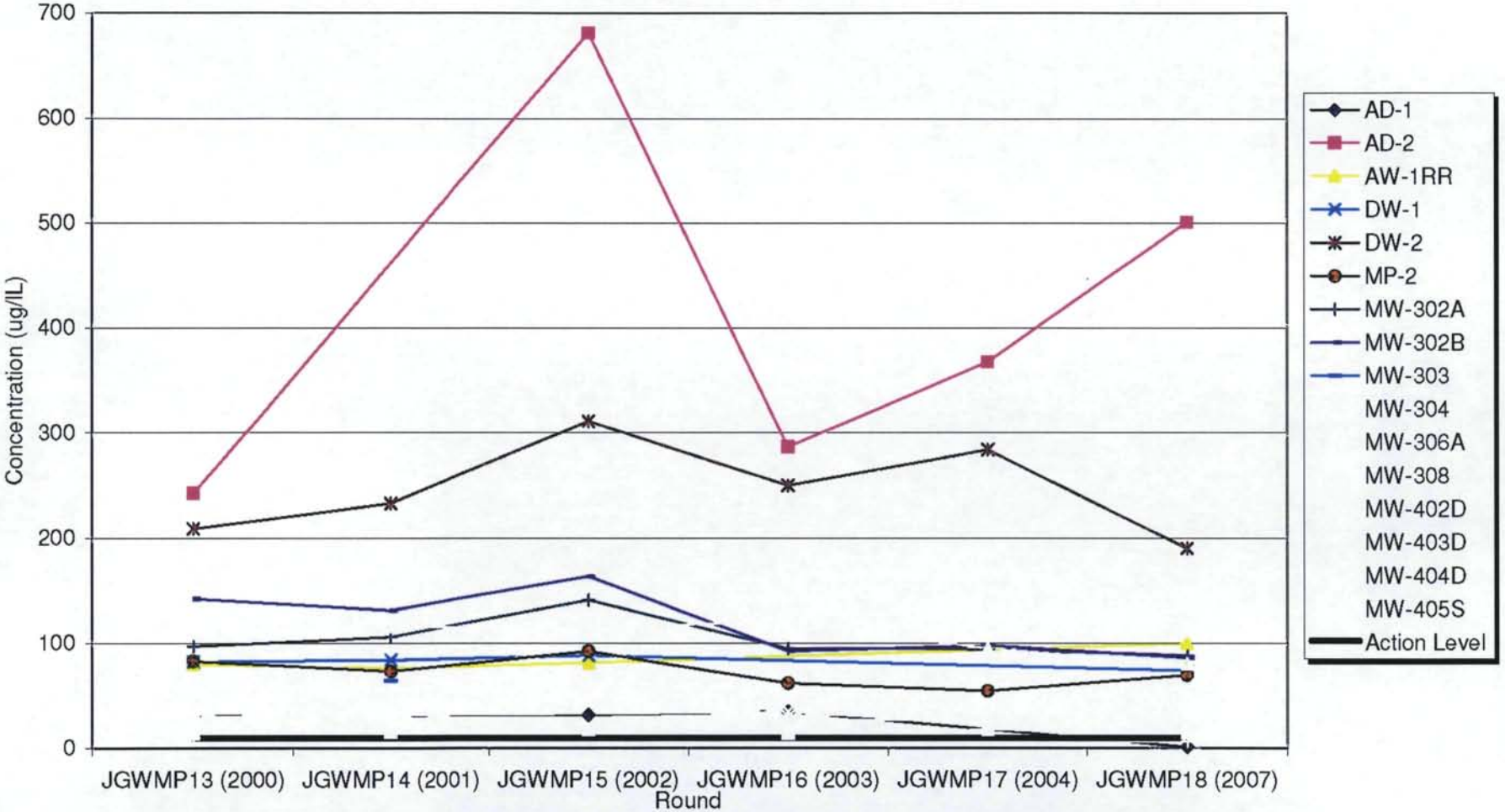


Figure 17. Arsenic results for wells exceeding 10 µg/L, PAC Remediation Area Peterson-Puritan Superfund Site, Cumberland, RI (ENSR, 2007).

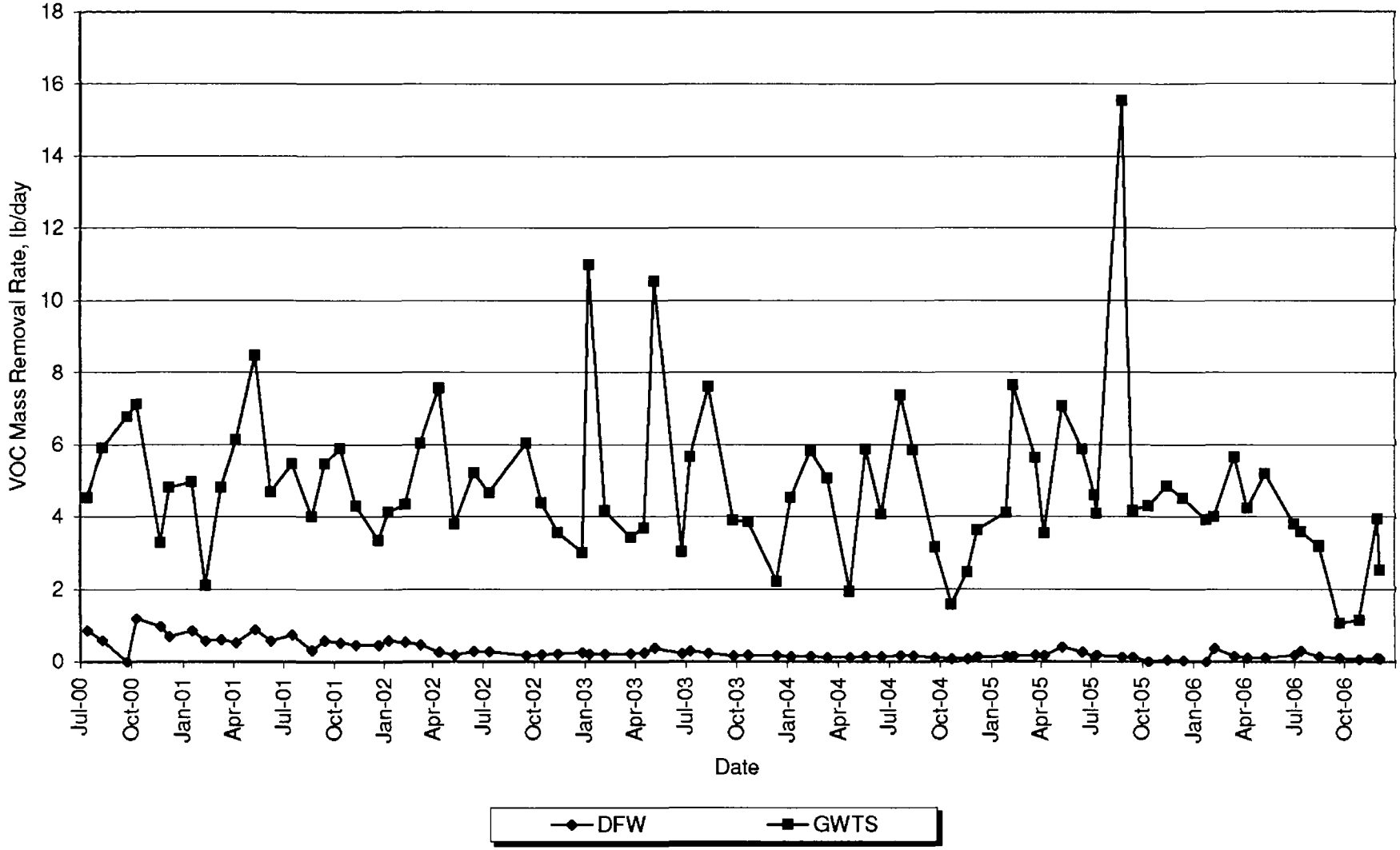


Figure 18. Dissolved phase mass removal of TTO by extraction system, CCL Remediation Area, OU-1 Peterson-Puritan Superfund Site, Cumberland, RI (ENSR, 2007).

APPENDIX B

Status of Access and Institutional Control Implementation
Peterson/ Puritan Superfund Site
Cumberland and Lincoln, RI

Status of Access and Institutional Control Implementation at the Peterson/ Puritan Superfund Site Cumberland and Lincoln, RI

OU	Parcel	Owner or Ownership Interest	Access	IC status	Party Implementing IC	Comments
1	C-P:34/L:100	KIK Custom Products, Inc. (fka CCL Custom Mfg) B705/P381, 6/17/97	✔	Pending - high priority	Unilever / Guardian Trust	
1	C- P:34/L:190	KIK Custom Products, Inc. (fka CCL Custom Mfg) B705/P381, 6/17/97	✔	Pending - high priority	Unilever / Guardian Trust	
1	C-P:34/L:235	KIK Custom Products, Inc. (fka CCL Custom Mfg) B705/P381, 6/17/97	✔	Pending - high priority	Unilever / Guardian Trust	
1	C-P:34/L:256	KIK Custom Products, Inc. (fka CCL Custom Mfg) B705/P381, 6/17/97	✔	Pending - high priority	Unilever / Guardian Trust	
1	C-P:34/L:138	The Okonite Co. B1314/P605, 1/31/06		Pending	Unilever / Guardian Trust	No current access agreement on record. Access requires verification by OU1 Parties
1	C-P:34/L:247	The Okonite Co. B1314/P605, 1/13/06		Pending	Unilever / Guardian Trust	No current access agreement on record. Access requires verification by OU1 Parties
1	C-P:34/L:139	RI Industrial Facilities B1151/P46, 9/9/03	✔	Pending - high priority	Unilever / Guardian Trust	Access secured by PP OU2 group by 12/2004 agreement by both RI IFC and by Hope Global

OU	Parcel	Owner or Ownership Interest	Access	IC status	Party Implementing IC	Comments
1	C-P:34/L:248	RI Industrial Facilities Corp.	✔	Pending - high priority	Unilever / Guardian Trust	Access secured by PP OU2 group by 12/2004 agreement; however no assessor's record–may be incorporated with lot 139. Further review required.
1	C-P:34/L:221	Cumberland Animal Control B1151/P46, 9/9/03		Pending - high priority	Unilever / Guardian Trust	No current access agreement on record. Access requires verification by OU1 Parties
1	C-P:34/L:222	Providence & Worcester Railroad Co. B288/P429, 10/03/80	✔	Pending	Unilever / Guardian Trust	Access secured by PP OU2 group by 12/2004 agreement
1	C-P:34/L:249	Seaconke Wampanog Tribe B1370/P584, 12/26/06		Pending	Unilever / Guardian Trust	Access secured by PP OU2 group by 12/2004 agreement is outdated ... need access w/ new owner
1	C-P:34/L:188	Saylesville Properties, Inc. B792/P244, 3/3/99		Pending	Unilever / Guardian Trust	No current access agreement on record. Access requires verification by OU1 Parties
1	C-P:34 /L:219	Saylesville Properties, Inc. B792/P244, 3/3/99		Pending	Unilever / Guardian Trust	No current access agreement on record. Access requires verification by OU1 Parties
1	C-P:34/L:220	Capital Investment Group, LLC B1367/P308, 1/10/07		Pending - high priority	Unilever / Guardian Trust	No current access agreement on record Access requires verification by OU1 Parties.

OU	Parcel	Owner or Ownership Interest	Access	IC status	Party Implementing IC	Comments
1	L-P:21/L:22	Town of Lincoln	✔	Pending	Unilever / Guardian Trust	Access secured by PP OU2 group by 12/2004 agreement
1	L-P:21/L:35	Town of Lincoln	✔	Pending	Unilever / Guardian Trust	Access secured by PP OU2 group by 12/2004 agreement
1	L-P:23/L:100	Town of Lincoln	✔	Pending	Unilever / Guardian Trust	Access secured by PP OU2 group by 12/2004 agreement
1	L-P:23/L:180	State of Rhode Island	✔	Pending	Unilever / Guardian Trust	Access secured by PP OU2 group by 12/2004 agreement; RIDEM signed agreement too. See below
1	L-P:21/L:22	Town of Lincoln	✔	Pending	Unilever / Guardian Trust	Access secured by PP OU2 group by 12/2004 agreement
1	C-P:58/L:56	(formerly) Pacific Anchor Chemical Company and Lonza (now) Berkeley Acquisition Corp B1212/P358, 6/28/04	✔	✔ Implemented	Lonza/Guardian Trust	In IC recorded in 2004. Easement grants access.
1	C-P:58/L:57	Swissline Products B1208/P472, 6/14/04 Tony Realty Corporation B1303/P150, 11/15/05	✔	✔ Implemented	Lonza/Guardian Trust	In IC recorded in 2004. Easement grants access.
1	C-P:58/L:116	John J & Eddy W. Pawluch B334/P41, 7/29/87	✔	✔ Implemented	Lonza/Guardian Trust	In IC recorded in 2004. Easement grants access.

OU	Parcel	Owner or Ownership Interest	Access	IC status	Party Implementing IC	Comments
1	C-P:58/L:69	Colleen Conley B1350/P5, 9/15/06		Pending	SuperValu	No current access agreement on record. Access requires verification by OU1 Parties
1	C-P:34/L:254	Berkeley Acquisition Corp B631/P235, 4/18/95	✔	Pending	SuperValu	Access obtained by EPA on 6/25/07
1	C-P:34/L:234	Berkeley Acquisition Corp B631/P235, 4/18/95	✔	Pending	SuperValu	Access obtained by EPA on 6/25/07
1	C-P:34/L:252	Berkeley Acquisition Corp B631/P235, 4/18/95	✔	Pending	SuperValu	Access obtained by EPA on 6/25/07
1	C-P:34/L:255	Mackland Realty B1209/P518, 6/11/04		Pending	Unilever / Guardian Trust	No current access agreement on record. Access requires verification by OU1 Parties. ICs may be required. Further review required.
1	C:-P34/L236	Redwood Realty II, LLC B1220/P586, 7/7/04		Pending	Unilever / Guardian Trust	No current access agreement on record. Access requires verification by OU1 Parties. ICs may be required. Further review required.
2	C-P:15/L:1	River Run Development Co. B1300/P643, 10/20/05	✔	No current risk. To be considered at time of future OU2 Record of Decision	To Be Determined	Access secured by PP OU2 group by 12/2004 agreement. Partial Delisting complete; GW monitoring well on property.

OU	Parcel	Owner or Ownership Interest	Access	IC status	Party Implementing IC	Comments
2	C-P:14/L:2	McNulty Properties Berkeley Commons Development Company, LLC B1331/P207, 5/17/06	✔	No current risk. To be considered at time of future OU2 Record of Decision	To Be Determined	Access secured by PP OU2 group by 12/2004 agreement. Partial Delisting complete, GW monitoring well on property.
2	C-P:14/L:4	McNulty Properties		To Be Determined by a future OU2 Record of Decision	To Be Determined	Access secured by PP OU2 group by 12/2004 agreement; however no assessor's record–may be incorporated with lot 1 or 2. Further review required.
2	C-P:13/L:106	J.M. Mills		To Be Determined by a future OU2 Record of Decision	To Be Determined	Access secured by PP OU2 group by 12/2004 agreement; however no assessor's record–may be incorporated with another lot. Further review required.
2	C-P:14/L:23	Seaconke Wampanog Tribe B1370/P581, 12/26/06		To Be Determined by a future OU2 Record of Decision	To Be Determined	Access secured by PP OU2 group by 12/2004 agreement is outdated ... need access w/ new owner.

OU	Parcel	Owner or Ownership Interest	Access	IC status	Party Implementing IC	Comments
2	C-P:12/L:12	J. M. Mills	✔	To Be Determined by a future OU2 Record of Decision	To Be Determined	Access secured by PP OU2 group by 12/2004 agreement
2	C-P:12/L:18	Casey Realty B1349/P768, 9/14/06		To Be Determined by a future OU2 Record of Decision	To Be Determined	Access secured by PP OU2 group by 12/2004 agreement is outdated ... need access w/ new owner.
2	C-P:12/L:19	Mackland Realty Inc. B231/P1972	✔	To Be Determined by a future OU2 Record of Decision	To Be Determined	Access secured by PP OU2 group by 12/2004 agreement.
2	C-P:13/L:28	Providence & Worcester Railroad Company B275/P759, 10/3/80	✔	To Be Determined by a future OU2 Record of Decision	To Be Determined	Access secured by PP OU2 group by 12/2004 agreement
2	C-P:15/L:91	Providence & Worcester Railroad Company B275/P759, 10/3/80	✔	To Be Determined by a future OU2 Record of Decision	To Be Determined	Access secured by PP OU2 group by 12/2004 agreement

OU	Parcel	Owner or Ownership Interest	Access	IC status	Party Implementing IC	Comments
2	C-P:14/L:6	Providence & Worcester Railroad Company B275/P759, 10/3/80	✔	To Be Determined by a future OU2 Record of Decision	To Be Determined	Access secured by PP OU2 group by 12/2004 agreement
2	C-P:34/L:253	Redwood Co., LLC B817/P483, 8/12/99	✔	To Be Determined by a future OU2 Record of Decision	To Be Determined	Access secured by PP OU2 group by 12/2004 agreement
2	L-P:12/L:212	RI DEM	✔	To Be Determined by a future OU2 Record of Decision	To Be Determined	RI DEM granted access until 7/31/2008 or until RI/FS is done, whichever comes first. Also access secured by PP OU2 group by 12/2004 agreement.
2	L-P13/L73	RI DEM	✔	To Be Determined by a future OU2 Record of Decision	To Be Determined	RI DEM granted access until 7/31/2008 or until RI/FS is done, whichever comes first. Also access secured by PP OU2 group by 12/2004 agreement.
2	L-P:21/L:62	RI DEM	✔	To Be Determined by a future OU2 Record of Decision	To Be Determined	RI DEM granted access until 7/31/2008 or until RI/FS is done, whichever comes first. Also access secured by PP OU2 group by 12/2004 agreement.

OU	Parcel	Owner or Ownership Interest	Access	IC status	Party Implementing IC	Comments
2	L-P:5/L:1	RI DEM	✔	To Be Determined by a future OU2 Record of Decision	To Be Determined	RI DEM granted access until 7/31/2008 or until RI/FS is done, whichever comes first. Also access secured by PP OU2 group by 12/2004 agreement.
2	L-P:5/L:93	RI DEM	✔	To Be Determined by a future OU2 Record of Decision	To Be Determined	RI DEM granted access until 7/31/2008 or until RI/FS is done, whichever comes first. Also access secured by PP OU2 group by 12/2004 agreement.
2	L-P:5/L:210	RI DEM	✔	To Be Determined by a future OU2 Record of Decision	To Be Determined	RI DEM granted access until 7/31/2008 or until RI/FS is done, whichever comes first. Also access secured by PP OU2 group by 12/2004 agreement.
2	L-P:12/L:209	RI DEM	✔	To Be Determined by a future OU2 Record of Decision	To Be Determined	RI DEM granted access until 7/31/2008 or until RI/FS is done, whichever comes first. Also access secured by PP OU2 group by 12/2004 agreement.
2	L-P:23/L:180	RI DEM	✔	To Be Determined by a future OU2 Record of Decision	To Be Determined	RI DEM granted access until 7/31/2008 or until RI/FS is done, whichever comes first. Also access secured by PP OU2 group by 12/2004 agreement.

OU	Parcel	Owner or Ownership Interest	Access	IC status	Party Implementing IC	Comments
2	L-P:29/L:88	RI DEM	✔	To Be Determined by a future OU2 Record of Decision	To Be Determined	RI DEM granted access until 7/31/2008 or until RI/FS is done, whichever comes first
2	L-P:29/L:295	RI DEM	✔	To Be Determined by a future OU2 Record of Decision	To Be Determined	RI DEM granted access until 7/31/2008 or until RI/FS is done, whichever comes first
2	L-P:30/L:19	RI DEM	✔	To Be Determined by a future OU2 Record of Decision	To Be Determined	RI DEM granted access until 7/31/2008 or until RI/FS is done, whichever comes first
2	C-P:12/L:4	Linda Marszalkowski B1107/P137, 4/23/03		To Be Determined by a future OU2 Record of Decision	To Be Determined	Access secured by PP OU2 group by former owner prior to12/2004 agreement. No current access agreement on record. Requires further review.
2	C-P:12/L:4	RI DEM	✔	To Be Determined by a future OU2 Record of Decision	To Be Determined	RI DEM granted access until 7/31/2008 or until RI/FS is done, whichever comes first

OU	Parcel	Owner or Ownership Interest	Access	IC status	Party Implementing IC	Comments
2	C-P:12/L:8	Inland American Cumberland, LLC B1334/680, 5/31/06		To Be Determined by a future OU2 Record of Decision	To Be Determined	Access secured by PP OU2 group by former owner prior to 12/2004 agreement. No current access agreement on record. Requires further review.
2	C-P:12/L:8	RI DEM	✔	To Be Determined by a future OU2 Record of Decision	To Be Determined	RI DEM granted access until 7/31/2008 or until RI/FS is done, whichever comes first
2	C-P:58/L:41	Industrial Facilities Rental Corp. B391/P328, 2/27/89		To Be Determined by a future OU2 Record of Decision	To Be Determined	Access secured by PP OU2 group by former owner prior to 12/2004 agreement. No current access agreement on record. Requires further review.
2	C-P:58/L:41	RI DEM	✔	To Be Determined by a future OU2 Record of Decision	To Be Determined	RI DEM granted access until 7/31/2008 or until RI/RS is done, whichever comes first
2	C-P:58/L:90	RI DEM B435/P254, 3/20/90	✔	To Be Determined by a future OU2 Record of Decision	To Be Determined	RI DEM granted access until 7/31/2008 or until RI/RS is done, whichever comes first

OU	Parcel	Owner or Ownership Interest	Access	IC status	Party Implementing IC	Comments
2	C-P:13/L:109	Cumberland Water B192/493, 7/13/64	✔	To Be Determined by a future OU2 Record of Decision	To Be Determined	Access secured by PP OU2 group by 12/2004 agreement
2	C-P:15/L:92	Cumberland Water B192/493, 7/13/64	✔	To Be Determined by a future OU2 Record of Decision	To Be Determined	Access secured by PP OU2 group by 12/2004 agreement
2	L-P:23/L:194	Town of Lincoln	✔	To Be Determined by a future OU2 Record of Decision	To Be Determined	Access secured by PP OU2 group by 12/2004 agreement
2	L-P:23/L:190	Town of Lincoln	✔	To Be Determined by a future OU2 Record of Decision	To Be Determined	Access secured by PP OU2 group by 12/2004 agreement

APPENDIX C
INTERVIEW AND INSPECTION DOCUMENTATION

INTERVIEW DOCUMENTATION FORM	
The following is a list of individual interviewed for this five-year review. See the attached contact record(s) for a detailed summary of the interviews.	
1. Notes of Team Meeting With Representatives of KIK Custom Products on June 28, 2007.	June 28, 2007
2. Notes of Interview with Mark Pawlitschek & Don Martin, Owners of Blackstone Valley Outfitters, and Allan Grassi, Live Bait Supplier.	August 16, 2007
3. Email exchanges with Kevin White (ENSR) concerning GWTP O&M.	June and July 2007
4. Notes of Team Inspection of PAC Area.	June 29, 2007
5. Notes of Interview with Representative of Town of Lincoln.	June 19, 2007
6. Notes of Interview with Nation Park Service	June 16, 2007
7. Notes of Interviews with Various Community Interest Groups.	June 16, 2007
8. Notes of Interview with Mayor and DPW Director for Cumberland, RI.	June 14, 2007
9. Notes of Interview with Superintendent of the Lincoln, RI Water Commission.	June 14, 2007

INTERVIEW RECORD 1

Site Name: Peterson/Puritan, Inc. Superfund Site Cumberland/Lincoln, RI	**EPA ID Number**: RID055176283
Subject: Second Five-Year Review, KIK Custom Products Interview and CCL Treatment Facilities Inspection	Date: 6/28/07
Type: Visit Location of Visit: See below	

CONTACT MADE BY

See below

INDIVIDUAL CONTACTED:

See below

SUMMARY OF CONVERSATION

Team Meeting With Representatives of KIK Custom Products on June 28, 2007.

Attendees:

- Adam Burnett and Ian Osgerby, USACE
- David Newton, EPA Remedial Project Manager
- Richard Ferreira, KIK Custom Products Plant Manager
- Lionel Souza – Environmental Manager
- Louis Maccarone, RIDEM Project Manager
- Douglas Simmons, ENSR, OU-1 Program Manager
- Kevin Whitney, ENSR, CCL OU-1 Site Manager:

Notes:

CCL Custom Manufacturing (at Martin St.) is now owned by KIK Custom Products.

Entered KIK building and met with KIK staff.

KIK expanding with acquisition of other facilities, became KIK on May 7, 2005.

Rich Ferreira explained production: same operations as Peterson/Puritan. Aerosol production – majority of production for personal care aerosol products and household cleaning products. Clients include Unilever, Proctor and Gamble.

Tankers from train tracks bring in chemicals including SDA alcohol and propellants – propane, isobutene, difluoroethane.

PCE was used in the 70's but not currently. The tanker spilled 6,200 gallons of PCE in 1974. PCE used for hairspray and cleaners. Now alcohol and water are used as propellants to replace the PCE.

No major property use changes anticipated. Facility operations expected to continue into the foreseeable future.

Institutional Controls in the form of deed restrictions need to be recorded. Includes EPA access agreement. Restrictions apply to caps, protections to infrastructure (wells, system pipes) and restrictions on use of ground water.

Inspection team was escorted to the tank farm. Inspected SVE extraction points and monitoring well heads/covers. 12 upper extraction points, 2 lower extraction points.

Groundwater extraction wells: 3 groundwater pumps on the upper terrace where the tank farm is located.

Upper terrace is glacial kame terrace overlying bedrock. Upper pipe racks send vapor and water to lower terrace, then underground at lower terrace.

Vapor extraction system includes 10-foot deep stainless steel pipes with 2-foot screen Three pumps on upper terrace draw down water to 12-17 feet below ground surface to assist vapor extraction. Some monitoring well covers need new bolts and seals.

Water pipes are above ground in tank farm and wrapped to reduce freezing.

#6 well is shutdown due to a broken pipe above where pipes enter ground. – pipe corroded at material interface. Pipe needs repair/replacement. Other pipes may have similar conditions and will need replacing over time.

MP-2 groundwater observation well – Japanese knotweed needs to cleared from well.

Observation well MW205 (by loading dock, SW side) - cover is gone and full of leaves and dirt, appeared not cleaned out or accessed for a long time. On lower terrace, 50-gallon-per-minute (gpm) pump rate for 3 extraction wells, 60 gpm total that can be handled in treatment plant. The system was designed for 100 gpm but only handling 60 gpm to not overload the filtration/treatment system. In the CCL source area, the pumped water comes into the plant at 5, 000 to 10,000 ppb of total VOCs. The water is discharged once treated at 500 ppb VOCs.

Team Inspection of the Vapor Extraction Pump House.

#6 well shut down, others running.

Pavement on west side of building is cracked and lifted by tree roots (poplar sp.)- indicates water in soil below the pavement.

Treated water is sent to the NBC sewer to the Bucklin Point POTW.

Down gradient treatment works located predominantly at Hope Global parcel. Seven extraction wells are in vaults. Underground utilities feed power to and pull water from wells to a below-grade confined space entry man way near to Martin St. where water from extraction wells are commingled and passed directly to the Narragansett Bay Commission (NBC) sewer. No pre-treatment required (per the permit). The NBC permit allows a maximum discharge of 200 gallons per minute. Actual pumping rates are closer to 160 gallons per minute. The maximum allowable total VOCs permitted equals 2,130 ppb. Any one chemical cannot exceed 1,000 ppb. Currently, the pumped water contains approximately 200 ppb VOCs and is tested monthly. Vaults are flooded occasionally by high water during storm events. Electrical fixtures are located above ground in four feet high control boxes.

INTERVIEW RECORD 2

Site Name: Peterson/Puritan, Inc. Superfund Site Cumberland/Lincoln, RI	**EPA ID Number**: RID055176283	
Subject: Second Five-Year Review, Blackstone Valley Outfitters	**Time**: 4:30pm	**Date**: June19, 2007
Type: Interview		

CONTACT MADE BY

Name: David Newton, RPM, USEPA

INDIVIDUAL CONTACTED:

See below

SUMMARY OF CONVERSATION

Peterson/Puritan, Inc. Superfund Site
Interview with Mark Pawlitschek & Don Martin, Owners of Blackstone Valley Outfitters, and Allan Grassi, Live Bait Supplier
June 19, 2007
Community Interviews

General Condition of the River:

Improvements in water quality are on the rise due to a marked decrease in industrial dumping. The river is healing from industrial pollutants. Storm water remains a factor. Scouting and local school groups are canoeing the river, all segments, including the Ashton/Pratt segment. Blackstone Valley Outfitters (BVO) takes pride in contributing to the cleanup of the river by pulling debris when observed. The company partners with other local groups when possible to help with cleanups. Still finding numerous tires, pallets, wood and construction (insulation) debris since the 2005 flood. Cast iron sink and couch (as examples) are observed in the river at the landfill. Having the old dump so near to the river, it is obvious that more junk each Spring is going to get into the river. The source of the tires is the landfill and island. At (former) Lonsdale Drive-in and vicinity there remains plastic highway barrels, shopping carts and other debris in river. Numerous Dunkin Donuts and McDonald's waste along with plastic power sports drinks bottles. Local companies should be fined or step up and voluntarily pay for supporting periodic cleanups. Lastly, after the 2005 flood there are observed to be three plastic 6-8" conduits (pipes) bowing out of the river (Valley Falls Pond segment) adjacent to Cadillac Textile Mill. These need to be investigated/removed (as hazards). People that use the river are turned off by the junk in the river. More needs to be done. It affects business to some degree. We do hear complaints at times.

Recreational Uses:

BVO supplies many of the needed goods and services to local community for recreating along the river from Woonsocket to Lonsdale. With only a couple of years under the belt, business is on an upswing. BVO is located in the Stop-N-Shop strip mall on Mendon Road. People are starting to find us. BVO rents canoes and kayaks to the general public. Also the company conducts supervised tours of the river. In July, 67 people rented boats. An estimated 40-50 on average rent from BVO during summer months. These people are usually recreating on the local river segment (Ashton through Lonsdale) and tours are started as high up the river as Woonsocket. BVO also assists the Paddlers Club on Thursday evenings for the Blackstone Valley Heritage Corridor. BVO is connected with the Blueways Trails Coalition which is designing a river course trail from Worcester to the Bay.

The bridge work at Martin Street has been an issue in that construction has hurt business and park use because of the closed the canal and bikeway. The canal is a means for conducting a round trip boat excursion from the Kelly House (RI Blackstone River Park, Lincoln side) down river to the Pratt Dam,

and portaging to the canal to go back north to the Kelly House parking area. Once reopened (later this month), it is expected that this round trip may be quite popular. The bikeway, once re-connected will provide a connected estimated 10 miles of service from Woonsocket to Lonsdale.

The BVO has a number of touring bikes which will be ready for rent once the bikeway has been opened again. The BVO may sell bikes in the future too. Recreational touring maps (by boat or bike) are available at the BVO and also at the various visitors centers (Woonsocket, Pawtucket, I-295 rest stop in Lincoln).

Recreational/Subsistence Fishing:

BVO supplies local anglers with live and packaged bait. BVO has on hand a supply of fishing tackle. While the BVO preaches a "Catch and Release" program, many local ethnic community anglers tend to keep a portion of the catch. Patrons have come in asking about the types of fish being caught at the Pratt. Last month an angler caught a northern pike at the base of the Pratt Dam and showed it to the BVO owner. The fisherman claimed he would keep it as a mounted trophy fish. Northern Pike appear to be on the rise, as is lay over trout (State stocking of farm bred trout takes place on the river in the Spring a mile upstream at the Ashton Dam). Large mouth bass, dace, shiner, bullhead catfish, sun fish, and carp are among the species seen most often. BVO would agree to pass out and information or flyers concerning the Blackstone River fishery and "Catch and Release" program.

Recommendations for Improvements at the Site:

BVO and its patrons wish to see more progress sooner. They want to see more in the ground access points established on the river. Camping along the river should be allowed to extend river trips over a couple to a few days. The Ashton Dam spillway is in major need of repair. The landfill is an eyesore and is a physical hazard if boaters came ashore. The island would be a perfect spot for day camping (if cleaned up appropriately). The site could remain as wildlife corridor, aviary (meadow grasses seeded for attracting birds and small mammals. Areas can not be restricted with fences or postings over the long term. More needs to be done to continue with the recreational progress now underway. More parks, recreation areas and gazebos to draw in the public. The Woonsocket Landfill improvements would be a good model for the J. M. Mills Landfill here in Cumberland.

INTERVIEW RECORD 3

Site Name: Peterson/Puritan, Inc. Superfund Site Cumberland/Lincoln, RI	**EPA ID Number**: RID055176283
Subject: Second Five-Year Review, KIK Custom Products Interview and CCL Treatment Facilities Inspection	Date: June and July 2007
Type: Email	

CONTACT MADE BY

See below

INDIVIDUAL CONTACTED:

See below

SUMMARY OF CONVERSATION

Questions and answers between USACE (Ian T. Osgerby) and ENSR (Kevin White) concerning the GWTP O&M:

Q1. If it works (address), take a peek at the attached PFD and if you have time can you add data where appropriate? For example, from notes on the visit day (6/28/07), I have 30 gpm from the 6 extraction wells to the GWTP but the ENSR Data Review/compilation (2nd FYR) says the effluent is 55/60 gpm; 43 cfm from the 14 SVE wells but the ENSR Data Review/compilation (2nd FYR) total (table 7-1: 1400 dscfm = includes the stripper air flows)? Hours/minutes for GAC regeneration cycle (270 min on adsorption, 60 min desorption on steam, 30 min on cool down, ? on standby)? Approximate design temperatures on individual cycle stage (assumed ambient temperature)? The mid bed temperature was 130°F on the visit day (Ta = 95°F plus 20°F from blower) which is about 15°F higher than normally recommended as an upper limit for GAC operation, although PCE does have the highest boiling temp of most CVOCs. Is the vent flow checked for VOCs discharged on the hottest day or a cool one (October was mentioned somewhere in the document(?)/Conditional Method II Stack Test in 2001)? What is the effluent discharge limit (TTO=2.13 ppm)?

A1. Approximately 60 gpm to the GWTS; 600 cfm from SVE, 800 cfm from air strippers; 270 min adsorb, 60 min desorb, 15 min purge, 30 min cool down; Vent flows are checked monthly; Wastewater effluent limit is 2.13 ppm TTO.

Q2. Is there a log of the mass production of VOC from startup similar to that shown in figure 7-1?

A2. See the first five year review report for the CCL remediation area for the VOC production through June 2000.

Q3. Has there been a calibration (ever/periodic) of the MW correction factor for typical gas composition to use in the mass flow calculation? The value for the blower effluent flow should also be taken, partly for comparison with the individual SVE wells. Is it?

A3. Results are reported as PCE, the most prevalent compound.

Q4. How is the correction factor used, is the sample flow dried or simply obtained by placing a PID in the individual SVE well duct (Page 7-8/ENSR 2nd FYR Data Compilation) which would have saturated flow [plus slugs of water]? Note: MicroSeeps provides a system for multiple measurements (packaged syringes) of gas flow samples plus a calculation of the average molecular weight and an averaged correction factor, based on a GC scan which they do when the sample syringes are returned. This was used on a project I recently worked on in S. Korea and proved to be especially helpful in correcting the PID measurement/calculation of contaminant mass flow.

A4.	PID measurements are made at the SVE wellheads, the combined SVE influent before and after the blower, and the after the SVE stream is combined with the air stripper off gas and before it goes into the carbon bed.
Q5.	What are the pertinent data for the mass flow estimate formula (Page 7-8/ENSR 2nd FYR/typical velocity of vapor stream -v, pipe radius -r, etc.)?
A5.	Velocities and temperatures are measured monthly (at the time of PID measurements) at various locations. Pipe sizes vary from 1.5" 12".
Q6.	Is there a record of the vent flow gas measurement made on a routine basis as a good measure for the record (a logged value) for compliance?
A6.	I don't understand the question.
Q7.	Has the use of an FID been considered for the mass flow measurement, much better when calibrated properly for a multigas composition?
A7.	Yes, an FID has been used; we had issues with refilling the carrier gas and problems keeping the flame lit.
Q8.	What are the details of PID calibration by EarthTech (ionization constant, calibration gas, etc.)?
A8.	EarthTech does not calibrate the PID. ENSR calibrates with 100 ppm isobutylene. PID data entered into the database has a correction factor of 1.9 applied to express results as PCE.
Q9.	What are the plans for shutting the system down temporarily (other than the Jan 03 to April 03 hiatus) to see if the mass recovery rate is affected? Figure 7-1 indicates that the mass recovery rate may be bottoming although it is not clear when time zero is: 112,000 #s (assuming 9.45 #/gal) is about 11,852 gals recovered in 3 years from July 1997 through May 2000, and now about 119,000 #s after an additional 7 years June 2000 to July, 2007, averaging 1000 #s/year. How do these quantities compare with the estimate/shipment of recovered solvent in the storage tank (17,500 gals)? Is a measurement of water content estimated (interface probe depth) in the solvent recovery tank? Actually the contaminant density conversion from #s to gallons is a little confusing! What is actually used?
A9.	We are still removing mass, so talk of a shutdown is probably premature. Figure 7-1 indicates VOC mass removed July 2000 - December 2006. 112,000# at first 5YR + 120,000# during second 5YR = 232,000# VOC removed (assuming 13.52 #/gal) = 17,200 gal. No, water content is not estimated. The mass is calculated according to the formula presented an Page 7-8.
Q10.	Page 7-8, Figure 7-2 indicates an infrequent GAC (CAS) change out (twice in 10 years of operations - see also table 7-1) but the text does not indicate the manner in which this is evaluated. Usually, a "heel (loss of active adsorption mass)" develops during many adsorption/desorption cycles leading to a gradual deterioration in operating efficiency/reduction in cycle time and eventual replacement. Could you clarify the experiences at P-P?
A10.	Figure 7-2 indicates GAC removal efficiency July 2000 - December 2006. Carbon replaced twice during this 5YR cycle.
Q11.	Figure 7-4: No record of the concentration maximum of the most prevalent compound (as per the permit) is provided. Is there a data source of this?
A11.	What clause in the permit are you referring to?
Q12.	The data presented in figure 7-2 (monthly) and 7-6 (daily) do not correlate well, if comparing locations of peaks (see April 01 and Aug 05); measurements are only made once a month (and EarthTech is on-site 2/3 times a week) so how was figure 7-6 prepared?
A12.	Figure 7-2 is GAC (vapor phase) removal efficiency. Figure 7-6 is the dissolved phase mass

removal. The data do not necessarily correlate.

Q13. TTO for the GWTS and the DWF wells are separate at 2.13 ppm each or combine?
A13. The GWTS and DFW discharges are two, separately permitted discharge locations. Permit conditions are the same (2.13 ppm TTO, 1.0 ppm single compound) for each location.

Q14. Do you have any recent copies of either of the permitted discharge analytical data (more detail rather than simply the reported TTO number)? Also, do you have any of the rational which led to the exclusion of cis-1,2-DCE from the TTO contaminants in the discharge compliance permit?
A14. Yes, and EPA has been copied on the monthly compliance reports (which include the laboratory analytical data) sent to the Narragansett Bay Commission. Attached is a copy of the December 2006 compliance report for your information. Re: cis-1,2-DCE, in accordance with the Rules and Regulations of the NBC, TTO is defined as Total Toxic Organics (Including the list of pollutants as defined in 40 CFR 433.11(e) and including the pollutants xylene and acetone). The list of compounds presented at 40 CFR 433.11(e) does not include cis-1,2-DCE.

Q15. Do you have any recent copies of the analysis of the vent discharge composition, the composition before/after the blower (preferably after given the water slugs possibly present in the SVE gas mixture from the wells? The proportion of VC would be of interest since it would be difficult to adsorb on GAC, at hot or cold ambient temperatures. Does any of the 1,4-Dioxane make it out of the GW and into the SVE stream? The interest in the SVE mixture concerns it's, i.e. whether it still contains a significant quantity of TCA, mostly PCE and/or some other compound of potential interest. The history of TCA is one that includes abiotic reactions such as hydrolysis and/or those which would generate VC, etc. Both 1,1-DCA and 1,1 DCE can lead to VC by subsequent dehalogenation. I have gleaned no indication of the magnitude of the original TCA loading, nor what prior spills of PCE might have added to the "known" 6000 gals, resulting in the 17,000+ gals recovered to date.
A15. Yes, we have analytical results of stack testing. See spreadsheet.
Vinyl chloride was not detected in the vapor stream.
1,4-Dioxane is not part of the target analyte list for the vapor stream.
TCA comprised approximately 11% of the influent vapor stream.
We have no new knowledge as to additional spills.

Q16. On the stack test which occurred on your watch, do you have a copy of the gas composition (VOCs, SVOCs, etc.)? Has any vent gas composition been evaluated at high ambient temperature conditions which require adsorption at bed temperatures above 115°F (ambient of 95 plus 20 across the vacuum blower would reach this, and if the bed temperature was not cooled adequately after the prior desorption cycle . . .?
A16. Same question as #2?

Q17. The cool down of the GAC after desorption has a 30 minute period. Is the cooling a static process or is a cooling flow of air? Provided to achieve a low starting temperature for the next cycle?
A17. Cooling is by blowing ambient air across the bed.

Q18. What conditions would you accept as indicating that the SVE system might be approaching asymptotic conditions and a "jiggle" might be required (pulsation pumping or a longer on/off cycling to provide conditions for an evaluation)?
A18. When individual well concentrations appear asymptotic, "jiggling" may be warranted.

Q19. What tanks did you mean in the attached pdf (ole1.bmp) with tank in and out data?
A19. The tanks are the Carbon vessels A & B. The air sampling technician called them "tanks" on his

chain-of-custody and, therefore, the laboratory kept that terminology. Results were produced for each vessel/tank and the average was reported.

Q20. Do you know how the measurements/samples (time period) were taken to represent an average?
A20. Two samples were collected continuously over the entire adsorb cycle for each vessel. The samples were analyzed individually. The results were averaged to obtain an average efficiency.

INTERVIEW RECORD 4

Site Name: Peterson/Puritan Inc. Superfund Site Cumberland/Lincoln, RI	**EPA ID Number**: RID055176283
Subject: Second Five-Year Review, PAC Remediation Area	Date: 6/26/07
Type: See below	

CONTACT MADE BY

See below

INDIVIDUAL CONTACTED:

See below

SUMMARY OF CONVERSATION

Notes from Team Inspection of PAC Area on 6/26/07

Present:

- Brad Dean and Brad Dean, Jr., Owners of [former] SuperValu and [former] PAC, Inc Facilities, respectively.
- Adam Burnett and Forest Lyford, USACE
- David Newton, EPA Remedial Project Manager
- Carolyn Scott/Shannon Gleason, ENSR PAC Project Managers

Notes:

Inspected three former leach field sites (one was a sanitary leach field). The two industrial leach fields were dug out ten feet deep. Two monitoring wells were located on the former Owens Corning property (Swissline/Tony Realty parcels). An oxidizer injection well ran for three years in the 90's and was not effective, due to continued resurgence of oxygen reduced ground water. The oxidizer treatment plant was decommissioned over the last five years, and the decommissioning was approved by the EPA. The total organic carbon is viewed as an excessive and long-lasting source complicating arsenic concentrations. Ground water samples had 240 ppm arsenic. The effluent placed in the leach fields was reportedly containing no arsenic. The effluent was an organic waste product. Currently, PAC/Lonza is requesting an arsenic TI waiver (technical impractibility waiver). The original request was rejected to due a lack of testing around the site. ENSR, representing PAC, will be reapplying for TI waiver for arsenic, now that additional monitoring wells have been placed around and west of the CCL site. We inspected all of the wells on the PAC site.

Notes on wells:

Well Number 301 is a bedrock well, and it was in place.

Well Number AD-1: in place.

Well Number AW1RR: the top was rebuilt within the last year.

Well Numbers 302 B and 302A were in place.

Well Number MW407 was not found. It is buried by a pile of wood chips, recently placed. It will need to be exposed and tested.

On the former Owens Corning property:

Well Numbers DW2 and DW3 are flush mount and are both bolted down.

Well Number 401 needs a new cap and needs to be bolted down. Bolts were missing. It was in a paved

drive.

LukOil Company, uphill from the site, is built over bedrock and had a gasoline leak in the '90's. The hydrocarbons went down into the bedrock and impacted the PAC site. Benzine and MTBE were found in Well Numbers 302 and 302B.

Well Number MW307 occasionally has chlorinated solvents.

Well Numbers 306A and B and 305A and B have signatures of chlorinated solvents.

Well Number 307 is intact.

In the parking lot of the Dean Warehouse (formerly SuperValu), there is a 55-gallon oil drum, full and overtopping, that has a significant oil slick on the pavement that may impact Well Number 307 in time.

The arsenic levels in the wells trend lower closer to the river.

Well Number 308 has 50 ppb arsenic.

TH Series Wells are not being tested and are being used for a focused investigation and are precluded for a long-term monitoring and are still intact, according to Dave Newton.

Well Numbers P1 and P3 are still being tested and were set up originally as piezometer wells.

Steel bollards were installed around Well Numbers P1 and P2.

Well Number P3 was not found. It is possibly under a tractor trailer truck, under a pile of leaves.

There are large stains, about 40 or 50 feet-wide, on the pavement around P3 location. The stains may be from gasoline or diesel spills. These spills pooled up around storm drains and appear to have drained into the storm drains. Storm drains drain directly into Blackstone River.

Portable pumps were in place along the river side of the parking lot, appeared to be set up in the event of a river flood to pump flood waters into the river over the berm between the parking lot and the river. The parking lot is only a few feet above the normal river height and within the river floodway.

The five-year review will recommend a higher rate of testing. Practices on site are possibly compromising well conditions.

INTERVIEW RECORD 5

Site Name: Peterson/Puritan Inc. Superfund Site Cumberland/Lincoln, RI	**EPA ID Number**: RID055176283
Subject: Second Five-Year Review, Town of Lincoln	**Date**: 6/19/07
Type: See below	

CONTACT MADE BY

See below

INDIVIDUAL CONTACTED:

See below

SUMMARY OF CONVERSATION

Peterson/Puritan, Inc. Superfund Site
Interview with Town of Lincoln
June 19, 2007
Community Interviews

Present:

- Adam Burnett, USACE
- Dave Newton, RPM, EPA
- Louis Maccarone, RIDEM
- John S. Faile, P.E., Superintendent, Lincoln Water Commission
- Al Ranaldi, Town of Lincoln
- John McQueen, Town of Lincoln
- Joe Almond, Town of Lincoln
- Kim Wiegand, Town Engineer, Town of Lincoln

Notes:
Dave Newton gave a review of the history of the site and the impacts on Quinnville well field. The ROD for OU-1 required a pump-and-treat system and has been operating since 1996. The plume has slowed.

The purpose of this review to ask whether the public safety is protected. The OU-2 site is being investigated, including the landfill and the transfer station. The Quinnville landfill is in a viable aquifer. John Faile said the official status of the wells is that they are on standby, not abandoned, and they can be turned back on and reused, if necessary.

The State of Rhode Island Water Resource Board has identified Quinnville well field as a potential major water source for the state. Dave Newton discussed the Nunes parcel. Louis Maccarone identified a concern about opening the Quinnville site to recreation before the ROD for OU-2 is completed.

Al said there is a problem accessing the Quinnville site for recreation. He said the Town of Lincoln is proceeding forward on the Lonsdale Bleachery redevelopment. The plan is for a commercial/residential mix. The location has recreation amenities because it is along the bike path and the river, and it would also be good for high-end condos or small industry, along with the small amount of existing industrial operations. The focus will be on recreation and access to recreational opportunities. All existing buildings have been adjusted for flooding, moved up four feet in elevation. They are promoting the Blackstone River is the centerpiece, along with the access to the bike path.

Al mentioned Owens Corning's clean-up of the Kelly House State Park, where the company's waste materials had been dumped. Louis asked Al if he's thought of a grand opening for the state park. Al said there are no plans. He did note that the landscaping is completed. Dave stated that solvent found in the

ground water in the park was barely above contamination levels, and the source is unknown.

Some contamination was found on the Quinnville site along the river. Al asked where the storm runoff from the River Run Commons development goes. Dave said that it goes into wetlands, and the River Run Commons development is no longer in the Superfund site. According to EPA, the developer has done his due diligence. The wetland is a buffer to the site. The River Run Commons residence will have a clear view of the JA Mills Landfill. Adam asked Al if there are any plans on the books for other uses at the Quinnville site. Al said no. Dave asked if the Town of Lincoln gets any calls on the super fund site, and Kim said they have not. The calls they get are when the quarry is actively blasting and about tree cutting.

There was discussion about the Unnamed Island. Adam asked who owns the island, and what municipality does Lincoln consider the island? Lincoln does not consider it part of their town. USGS survey shows that the island is split between the towns of Lincoln and Cumberland. John McQueen said that the island is not Lincoln's. Louis said that the Rhode Island state statutes say that the land lines go the center, bank to bank, of the stream. With that definition, the island would be split. Kim said, "We don't want waste hauled into Lincoln. It is a residential neighborhood." John McQueen said, "Lincoln has no claim or plans for the Unnamed Island."

John McQueen said that "RONCI" owns the canal and that boards controlling water flow into the canal were removed and replaced 30 times a year. The canal floods and causes residential flooding and has caused canal breeching. The town gets frequent calls about flooding with requests to take out the flashboards. The town considers the canal an important historical and recreational resource.

INTERVIEW RECORD 6

Site Name: Peterson/Puritan, Inc. Superfund Site Cumberland/Lincoln, RI	EPA ID No.: RID055176283
Subject: Second Five-Year Review	Date: 6/19/07
Type: Meeting/Interview with National Park Service	

CONTACT MADE BY

See below

INDIVIDUAL CONTACTED:

See below

SUMMARY OF CONVERSATION

National Park Service
Woonsocket, RI
June 16, 2007
Community Interviews

Participants: Tom Ross, National Park Service, Blackstone River National Heritage Corridor
Dave Newton, EPA Remedial Project Manager
Lou Maccarone, RIDEM Project Manager
Sarah White, US EPA Community Involvement Coordinator

On Thursday, August 16, 2007, US EPA and RIDEM representatives met with Tom Ross from the National Park Service to assess his concerns about the Peterson Puritan Superfund site. The following is a summary of his concerns.

Overall Goals of NPS on the Blackstone River:

- Cleanup the river to the extent that it ties into a clean and healthy river
- Promote recreational opportunities that the river provides to build stewardship of the river

Management of the Blackstone River:

- NPS operates under a management plan
- NPS is working with the Blackstone River Corridor Commission to implement the requirements of the Blackstone River Management plan
- NPS is working with multiple stakeholders to promote a swimmable and fishable river by 2015
- Regarding river access, NPS has an access plan underway, and is looking to update it
- NPS wants to build recreational amenities (i.e. river landings)

Future of NPS and the Blackstone River

- BRNHC is currently under a special designation

- BRNHC will retain name but could lose it's federal funding after five years
- NPS will request that a special resource study be undertaken that looks at whether there is a place of national significance and this could be designated a NPS park in perpetuity
- Heritage Corridor has a significant story- history, environment, recreational use
- NPS' task is to wade through options, may or may not see NPS as a permanent presence with corridor management
- NPS' role is as a facilitator organization
- there will eventually be a successor organization but unsure what the make up may be at present time
- NPS has been awarded $10 million in development funding to be used in projects and programs that tie into NPS management plan

Fishing:

- NPS wants to raise awareness about warning people about eating the fish, catch and release etc.
- Currently there is no signage warning about contamination in/not to eat the fish
- Warnings can be incorporated into educational piece
- There are four dams on the river and the goal of NPS is to provide fish passage for anadromous fish
- there maybe a spawning area in Superfund area
- $1.25 million to study fish
- NPS would like to review EPA's fish fact sheet when prepared

JM Mills Landfill

- NPS has looked at recreational opportunities at landfill

Bikeway

- 10½ miles of bikeway complete
- Bikeway goes from Woonsocket Landfill to Lonsdale currently

INTERVIEW RECORD 7

Site Name: Peterson/Puritan Inc. Superfund Site Cumberland/Lincoln, RI	**EPA ID Number**: RID055176283
Subject: Second Five-Year Review, Special Interest Groups	**Date**: 6/19/07
Type: See below	

CONTACT MADE BY

Name: See below

INDIVIDUAL CONTACTED:

Name: See below

SUMMARY OF CONVERSATION

Peterson/Puritan, Inc. Superfund Site
Interest Groups
June 19, 2007
Community Interviews

On Thursday, June 19, representatives from the EPA and ACOE met with representatives of special interest groups (MA Audubon, Blackstone River Coalition, Blackstone River Watershed Council/Friends of the Blackstone, and Trout Unlimited) for the purpose of conducting interviews in support of the Five Year Review of the Peterson/Puritan, Inc. Superfund Site.

Present:

- Adam Burnett, USACE
- David Newton, EPA Remedial Project Manager
- Roland C. Galvin, Pres. NRITU, Dir. Blackstone River Coalition, Dir. BRWC/FOB
- Donna Williams, Mass Audubon Society, Blackstone River Coalition
- Peter Coffin, Blackstone River Coalition
- Louis Maccarone, RIDEM Project Manager

Notes:

Meeting started at 3 PM.

Donna asked what remediation is occurring. Dave summarized the remedial activities in OU1.

Peter asked if the town of Lincoln intends on reusing the wells of Quinnville. The answer is that the wells are on standby for potential future use.

Roland asked, "Is the solvent plume from OU-1 entering the river?"

Dave answered, that probably some is getting in, but it is volatile because it is a solvent and is expected to quickly disperse out of the water, so it was not considered to be an ecological impact according to the risk assessment.

Roland said, "There was a coliform issue in the wetlands southeast of the J M Mills landfill." Dave concurred and stated that there are probably several sources for the coliform. One is residential septic runoff uphill, another may be from runoff from a local restaurant, and also it is possible that a local landscaping operation is contributing due to a manure stock pile in the vicinity of the storm sewer.

Roland asked, "What is the extent of the contamination?"

Dave explained OU-1 and OU-2 contamination in detail.

Donna asked what was found in the quarry at Dexter, to the southwest of the river. This site is outside of

the superfund site and is a limestone mine and it contains Owens Corning waste material. Owens Corning agreed to perform a site investigation as mitigation so that they could be released from further liability in a bankruptcy settlement with the State and involving OU-2. They also cleaned up a fiberglass dump at the Kelly House and conducted a limited removal action at the Island. Donna said, "The Kelly House landscaping is phenomenal."

There was discussion about the excavator that had been abandoned on the Unnamed Island. Dave explained that it was removed from the site recently through a partnership effort between the state, the Corps of Engineers, RIDOT, OC, and the EPA. The contractor working on the Londsdale Restoration Site performed the work.

There was a discussion on the history of the JM Mills Landfill and the gravel pit and landfill on the Unnamed Island. Dave explained that there was a tax sale of the JM Mills Landfill site. Cumberland sold the land, through a tax sale, to attorney Patrick Connelly. Connelly donated the landfill site to the Seakonk Wampanoag Tribe.

As part of the OU-2 RI, there was fish sampling in the Blackstone River, and it was found that the fish are contaminated with PCB's, pesticides, and PAH's. EPA is preparing a fact sheet to go out to the public in October that will have the results of the fish tissue test. The issue of eating the fish caught in the river was discussed. Roland asked, "How high are the toxin levels in the fish?" Dave said the toxins are above risk-based levels. Dave said that the EPA is considering recommending that an advisory be released in Rhode Island to not eat the "resident" fish in the Blackstone. [Stocked fish and anadromous species were not considered in the study presently in that these species have a short residence time in the river and may not be impacted.]

Roland recommended that any area to the water's edge of the river should not be used as a landfill or transfer station. He said, "We will probably need the Blackstone aquifer in the future as a water source." He asked what was found in the landfill. Dave talked about presumptive remedy. Water was tested underneath the landfill, but the landfill material wasn't exposed.

Donna said, "Regarding post-closure use, how does this affect remedial actions? Is this important?" Dave said they would be looking at impacts on reasonable uses, including canoeing, fishing, and wildlife upland meadow corridor. Additionally, Corridor Commission/ NPS has considered the island as a portage area around Pratt dam, as a day camp for environmental education. He said the RI report will identify risks to human health, and the FS will identify alternatives.

INTERVIEW RECORD 8

Site Name: Peterson/Puritan Inc. Superfund Site Cumberland/Lincoln, RI	EPA ID No.: RID055176283
Subject: Second Five-Year Review, Town of Cumberland	Date: 6/14/07
Type: See below	

CONTACT MADE BY

See below

INDIVIDUAL CONTACTED:

See below

SUMMARY OF CONVERSATION

Peterson/ Puritan Community Interviews
Town of Cumberland, RI
June 14, 2007
Community Interviews

On Thursday, June 14, representatives from the EPA and USACE met with the Mayor and Department of Public Works Director for the Town of Cumberland, RI for the purpose of conducting interviews in support of the Five-Year Review of the Peterson/Puritan Superfund, Inc. Superfund Site.

Participants:

Mayor Daniel McKee, Town of Cumberland
Eugene Jeffers, Director of Public Works
Dave Newton, US EPA Remedial Project Manager
Adam Burnett, USACE
Sarah White, US EPA Community Involvement Coordinator
Louis Maccarone, RIDEM Project Manager

Notes:

- Ashton-Pratt Reuse PlanThe Town is opposed to the proposed construction/demolition (C/D) facility on Martin St.. The plan was used as leverage to deter facility on Martin Street. The Mayor rescinded certificate of zoning, which was improperly issued to the facility. The Company may appeal the recision.
- Since EPA financed the report, the Town would like to be aware of any EPA funding that could help implement the reuse plan.

Hope Global

- The Hope Global Warehouse is in the Blackstone River floodplain and gets flooded regularly.
- The Mayor said the Town is concerned about flooding at Hope Global and wants to explore a remedy for flooding.
- The Mayor wants better berms or other protection to stop the floodwaters. He asked whether USACE has a program for flood damage protection.
- USACE has the Section 205 Program for flood damage reduction studies.

Martin Street Ballfield

- Mayor indicated that, after 2005 flood, previous administration decided to test soils.

- Testing raised awareness of potential for arsenic in soils at levels above RIDEM soil standard within a limited area of ballfield.
- The Town found a level of 7.3 ppm of arsenic (1.7 ppm is the Rhode Island risk based threshold, and 7.0 ppm is Rhode Island's regulatory limit).
- The Town conducted 20 tests, two of which had arsenic levels above the threshold level.
- EPA is continuing to monitor the Superfund contaminants within the groundwater plume under ballfield.
- According to EPA, the arsenic issue is outside purview of Superfund.
- Town is working with RIDEM to resolve the arsenic issue.

Institutional Controls

- Institutional Controls still need to be put in place. Some 28 parcels are affected. PRPs must negotiate with property owners, including the town.

J. M. Mills

- JM Mills landfill is now owned by the Seakonk Wampanoag Tribe.
- Town asked if EPA is aware of recent tribal acquisition of property. Governor was contacted by Chief of the Wampanoag tribe to inquire about cleanup strategy and Town was also contacted by the Governor's office
- Seekonk Wampanoag was gifted the property from a party immediately following a tax-lien sale. A question was raised about whether taxes were paid.
- The Seakonk Wampanoag Tribe may potentially seek federal recognition through ownership of the property as they are not as of now a federally recognized tribe.

Nunes parcel

- Trespassing and vandalism has been ongoing at the parcel.
- The Town will be considering options, including condemnation of vandalized buildings.
- The Town inquired about resources for cleaning the site.
- EPA could be factored into remediation.
- There are numerous abandoned vehicles in and around Nunes parcel.
- There are health and safety issues and site security issues.
- Condemnation of property was discussed.

Use of Blackstone River

- The Town is trying to figure out ways to maximize use of river for economic development.
- The Town discussed the river from an economic point of view.

INTERVIEW RECORD 9

Site Name: Peterson/Puritan, Inc. Superfund Site Cumberland/Lincoln, RI	EPA ID No.: RID055176283
Subject: Second Five-Year Review, Lincoln Water Commission	Date: 6/14/07
Type: See Below	

CONTACT MADE BY

See below

INDIVIDUAL CONTACTED:

See below

SUMMARY OF CONVERSATION

Peterson/Puritan, Inc. Superfund Site
Lincoln Water Commission
Lincoln, RI
June 14, 2007
Community Interviews

Present:

- John Faile, Superintendent, Lincoln Water Commission
- Nancy Kurowski, Administrative Assistant, Lincoln Water Commission
- David J. Newton, US EPA Remedial Project Manager
- Adam Burnett, Army Corp of Engineers
- Sarah White, US EPA Community Involvement Coordinator
- Louis Maccarone, RIDEM Project Manager

Notes:

On Thursday, June 14, representatives from the EPA and ACOE met with the Superintendent of the Lincoln Water Commission for the purpose of conducting interviews in support of the Five Year Review of the Peterson/Puritan, Inc. Superfund Site.

Quinnville Wellfield

- The wells are currently on inactive status.
- The Water Commission has no plans to reactivate the well field though they do not want to abandon the wells.
- Quinnville property management is a co-responsibility of the Town and Water Commission. Water Commission is a separate entity from the town.
- Unlikely that Quinnville Wellfield property will be sold. The town wants to preserve open space.
- The town is interested in positive recreational use of parcels for canoe/kayak access.
- Cost is a primary reason presently as to why the Town/Water Commission would not consider bringing wells back on-line. Regulatory issues, staffing and re-tooling are other and back to service because it would be a regulatory nightmare also would have to provide treatment, permitting, labor, operate etc.
- Lincoln is connected to Scituate Reservoir (Providence Water Supply) primarily, and also

Woonsocket which provides water. For emergency, Town is also connected to Pawtucket water supply as backup.

Safety/Liability:

- Town is addressing periodic vandalism to the well houses; concerned about liability
- Pumps and electric works have been removed, but the Commission doesn't know if the wells have been securely capped
- The well shaft is sealed.
- Wells are on "inactive status" under RIDOH which means that, if necessary in an emergency, wells could be re-instated with appropriate engineering. Wells not considered "abandoned" to date.
- EPA may send follow-up correspondence in response to Water Commission letter addressing certain security actions at the Quinnville Wellfield.
- Water Commission wants the pump house buildings permanently secured ASAP
- Water Commission is going to address buildings in phases: patch/cement the holes in the well house, and then consider options to knock down buildings, secure all wellheads and remove certain demolition debris from property
- The well houses are additionally a RIDEM issue because of potential debris that could be released during a flood.

Institutional Controls:

- The Water Commission was informed of the requirement for Settling Defendants' placement of deed restrictions on property.

Quinnville Wellfield Inspection (Conducted June 16, 2007):

- John Faile lead a field inspection of the wellfield and three wellheads with Adam Burnett and David Newton.
- Buildings were grown over with vegetation, and access roads were enclosed by vegetation, with disintegrated asphalt.
- Concrete building walls had evidence of vandalism and breaking and entering. The Commission had blocked several holes with bolted steel plates and welded shut door latches and hinges.
- The chain-link fences and gates enclosing the buildings were vandalized with broken locks or large holes in the fences.
- EPA's monitoring wells were inspected and in good shape.
- There is evidence that pedestrians were using some of the grown-over road system as a trail network, connecting as loop trails directly to the canal bikepath.